



Science Magazine Podcast Transcript, 7 June 2013

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Promo

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Music

Interviewer – Sarah Crespi

Finally today Lizzie Wade, a writer for our online daily news site, is here to give us a rundown of some recent stories. I’m Sarah Crespi. First up we have a story on the tiniest primates ever discovered. Under a lake bed in China researchers discovered a tiny, ancient fossilized primate, and after 10 years of study we’re starting to get some answers.

Interviewee – Lizzie Wade

Yeah, so this fossil is known as *Archicebus achilles*, and the *achilles* part comes from the fact its foot is pretty special. It looks a lot like a monkey foot, even though this thing lived well before monkeys ever evolved. It’s 55 million years old, and it falls right at this point on the primate family tree where a group of primates called anthropoids, which include monkeys, apes, and eventually humans, are diverging from another group of primates known as tarsiers, which today live only on a few islands in southeast Asia. *Archicebus* is just slightly more tarsier than anthropoid, but it has a lot of anthropoid features like the monkey-like foot and these pretty small eyes that have helped researchers conclude that it probably hunted during the day and not at night like modern tarsiers.

Interviewer – Sarah Crespi

Right because modern tarsiers have giant eyes.

Interviewee – Lizzie Wade

Giant eyes. The researcher told me that a single tarsier eyeball has the same volume as a tarsier brain.

Interviewer – Sarah Crespi

Wow! Wow! What are we working with here? How much of the animal was actually recovered in these fossils?

Interviewee – Lizzie Wade

It’s quite well preserved, especially for something that is so tiny. It really – they think the animal weighed less than an ounce, which is significantly smaller than any primate living today. So this thing is really small, and it was very hard to find. In fact they couldn’t really even extract it from the rock that it was embedded in. They had to take it to a synchrotron in France to use the X-rays there to image it. But once they did, they saw that they had quite a few bones preserved. The feet are really well-preserved, as are

the hind legs, and all the vertebrae in this very long tail that it had. The arms are missing, and the skull is there, but unfortunately it's partially crushed, so that's where everybody expects there to be the most debate about this fossil in the coming years, like what exactly does the skull look like when you reconstruct it?

Interviewer – Sarah Crespi

So what does this tell us about the history of tarsiers and just, you know, primates in general?

Interviewee – Lizzie Wade

Well it tells us that our earliest primate ancestors were likely really, really small, which has been a debate for a long time in the field. And it tells us something really interesting about where primates originally evolved. Humans, as we know, evolved in Africa. And so for a long time scientists thought that all primates evolved in Africa; that everything happened there. And now, with this fossil and with a few decades of other fossils that have been found, that origin location has likely moved to Asia. So researchers are thinking that the very first primates evolved in Asia and moved to Africa and the rest of the world from there.

Interviewer – Sarah Crespi

What else is going to be done with these fossils now that we have this first load of information?

Interviewee – Lizzie Wade

Well, this first load of information took about 10 years to get. They discovered this fossil 10 years ago and have been keeping it very secret ever since. And so any other information that comes out will likely take a while, but they already have more synchrotron data that they just didn't have a chance to analyze for this first round. So they're going to keep looking. And, of course, they're going to keep excavating. That's what's really going to help is if they could find other similar fossils of its close relatives, right, so you could tell more about its precise position on the primate family tree, if you knew the other kinds of animals that were right around it. They were pretty lucky to find this really remarkable specimen, so it's going hard to find anything else like it, but they are trying.

Interviewer – Sarah Crespi

Next up we have a story on love and marriage in the internet era. Internet dating has become commonplace, but how do these relationships hold up in the long run?

Interviewee – Lizzie Wade

Pretty well, science suggests. So at this point it's been several years since these online dating sites have really come into their own. So researchers – social science researchers and psychologists – are starting to be able to get real data on relationships that have started online and have lasted, or not.

Interviewer – Sarah Crespi

This is a pretty big dataset. I think it's 20,000 couples. Where did this come from?

Interviewee – Lizzie Wade

A scientist who is actually an advisor to eHarmony, which is a big dating website, had realized that they probably wanted to do a survey of how exactly online dating is affecting people's relationships or contributing to them. So he convinced eHarmony to pay for an online survey, which he then had analyzed by independent researchers, and eHarmony had agreed to publish this information no matter what the results were. And so they sent out an email survey – appropriately, I suppose – to almost half a million people; 200,000 of those responded, and almost 20,000 people out of those were chosen to participate. Those 20,000 people who participated got married between 2005 and 2012.

Interviewer – Sarah Crespi

So they studied couples that were married at a certain point in time, and how were these marriages different from those that were sparked offline?

Interviewee – Lizzie Wade

Well, first of all an impressive fact about online dating, I guess, is that it's really become quite mainstream. Over one third of the people surveyed who got married in between 2005 and 2012 met their spouse online, and half of those people met on online dating – dedicated online dating websites. The rest of them met through chat rooms or video games, other places you can meet people online. The people who met online turned out to be slightly less likely to divorce and scored slightly higher on signs of marital satisfaction; like if they answered yes to questions like do you still have chemistry with your partner and things like that.

Interviewer – Sarah Crespi

So there are some caveats for this research. Can you talk about those a little bit?

Interviewee – Lizzie Wade

They did a control for demographic information and, crucially, how much time you spend online. So they were trying to get a representative sample of the population in terms of online habits. They didn't really control for things like personality, mental illness, things like that. It's not necessarily the case that people who participate in an online dating website have more or less incidence of these things, but it would help to know that.

Interviewer – Sarah Crespi

And one way to get around this problem was suggested in the article.

Interviewee – Lizzie Wade

One scientist suggested that one way of getting around some these issues of having a representative sample of different kinds of people would be to randomly assign participants in a future study to meet people either online or in the real world. I guess this would have to be people who are interested in dating and I'm not sure exactly how

this would work, but it sounds interesting. Unfortunately, this researcher says that at this point none of the online data firms are interested in funding such research.

Interviewer – Sarah Crespi

Okay, finally we have a story on the cicada's chirp. These noisy bugs are undergoing a boom in the U.S. right now, and while we know things about their life cycles that allow us to predict booms like this, we don't know how cicadas make all the racket that they do.

Interviewee – Lizzie Wade

Yeah, so cicadas are really loud – famously loud – as we are soon to discover on the east coast, I'm sure. And scientists who study acoustics – acousticians – are very interested in exactly how cicadas, who have tiny little bodies or bugs, how they can make such loud noises. So a couple of them have studied the anatomy of the cicadas. So the part of the cicada that helps them make the noise is called a tymbal, and they have two of them, which are located on each side of the abdomen. It's kind of like a little drum where a membrane is stretched between two ribs, but instead of beating on the drum, or beating on that membrane, the ribs themselves expand and contract really quickly, and that is the thing that creates the noise.

Interviewer – Sarah Crespi

So how did they figure out how the noise was generated from these tiny bugs?

Interviewee – Lizzie Wade

So to study, you know, these really, really small features of the cicada's anatomy they used microcomputed tomography, which is a kind of CT scan. And it can pick up details as small as a micron in size, which is good because the ribs in the cicada's tymbal are like about as big as a human hair. So they really had to get very deep in there to figure out what was going on.

Interviewer – Sarah Crespi

We knew that these were loud, but what about by the numbers? How, what is the power of a cicada's chirp?

Interviewee – Lizzie Wade

So the loudest cicadas can make a noise that's 20 to 40 decibels louder than any shelf speaker that you can buy in Radio Shack. So it's really loud. And they're so small, so that's really a shocker.

Interviewer – Sarah Crespi

Right, and so they don't have a lot of energy or a lot of leverage, but they're making this giant noise. What are some of the applications for this type of research, then?

Interviewee – Lizzie Wade

So, in one field that you really want to know how to make loud noises without needing to use a lot of power is in sonar. And the Navy is really interested in using this for obvious

reasons. That's how they image things under water. And they think it would just be great to have a really powerful sonar machine that could run on as little power as a cicada needs.

Interviewer – Sarah Crespi

Okay! Well, what else is on the site this week, Lizzie?

Interviewee – Lizzie Wade

We have some really great stuff. One of my favorites was a story about how guppies can father offspring from beyond the grave. Also on the site this week we have a story about the ancient origins of French wine; that was fascinating and delicious sounding. And on *ScienceInsider*, our policy blog, we had a great story about Europe's new particle physics plan and its implications for the whole field. And coming up this week we have a live chat about some of the challenges of getting humans to Mars, and we'll have a very special guest, Buzz Aldrin, the famed astronaut and second man on the moon. So please tune in to ask him any questions you have about the challenges and potentially the benefits of long term human space travel. And next week we have a chat about bioelectronics. These are all video chats. You can watch and ask questions about our cyborg future.

Interviewer – Sarah Crespi

Okay. Lizzie Wade is a writer for *Science's* online daily news site. You can check out the latest news and the policy blog, *ScienceInsider*, at news.sciencemag.org where you can also join a live chat, *ScienceLive*, on the hottest science topics every Thursday at 3 p.m. U.S. Eastern time.