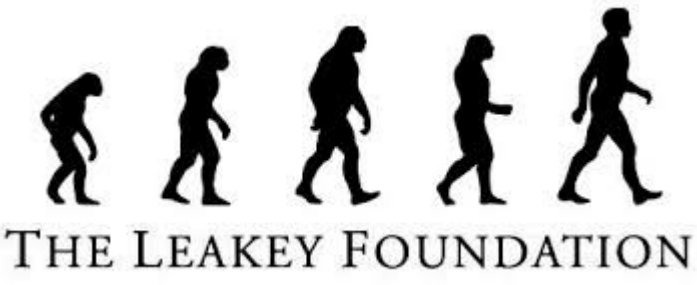

Origin Stories Episode 5: Discovery at Ledi-Geraru
August 25, 2015

Meredith Johnson
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This is Origin Stories, the Leakey Foundation podcast. I'm Meredith Johnson.

In this episode, we'll hear the story of a remarkable discovery, a discovery that's changed our understanding of early human evolution. Producer Schuyler Swenson brings us the story.

Chalachew Seyoum
We human beings are very curious to know about where we came from and how we evolved, who we are. Everybody should care, you know, to know where we came from. That's what I say.

Schuyler Swenson
This is Chalachew Seyoum. He was born and raised in Ethiopia. For scholars of human evolution, the country's a gold mine, an unlikely gold mine.

Chalachew Seyoum
Oh, it's really a desert. You know, small trees, no shade. It's full of sediment, you know, normal land. It's not very attracting for people, for ordinary people. But for people like me, I enjoy going there.

Schuyler Swenson
Seyoum's a graduate student in paleoanthropology at Arizona State University.

Chalachew Seyoum
I love to see that kind of landscape because that's where we found most of these amazing discoveries all over the world.

Schuyler Swenson
In January, 2013, he joined a team of scientists in Lee Adoyta, the Afar Region of Ethiopia. At a site known as Ledi-Geraru, they were searching for signs of early hominids, our early human ancestors.

Kaye Reed
We knew it was going to be hard work but if we could find anything it would be exciting.

Schuyler Swenson
This is Kaye Reed. She's co-leader of the team at Ledi-Geraru. She's a paleoecologist at Arizona State University. And she studies the environments and lifestyles of early hominids. Reed and her colleagues have been surveying at Ledi-Geraru on and off for nearly a decade.

Kaye Reed
We would go out there for six weeks and just walk. We used to call them death marches because there's a lot of sediments out there that have no fossils, they're lake sediments. And it's a deep lake so you get a lot of fish. But you don't find other types of animals.

Schuyler Swenson
Seyoum says these sediments are actually really important to their process. One of the first steps in a search for ancient fossils is dating the land. The sediment from the Ledi-Geraru site shows that it's around 2.8 million years old, a time period that we don't have a lot of hominid fossils from.

Chalachew Seyoum
So anything we found between that time period was going to be important in understanding in a human evolutionary study.

Schuyler Swenson
Reed says geologists spent about three years studying sediments before they even started collecting anything. After all this time in the field, Reed knows all the ins and outs of setting up camp.

Kaye Reed
It goes from nothing in a space to a space with 45 personal tents, 3 large tents, a science tent, a cook tent, a dining tent. We have great food in the field thanks to our kitchen crew. We have pizza. They bake bread every day in an oven. They dig a hole in the earth and they have

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charcoal around it, and generators and shower equipment and toilet seats for the long-drop toilets.

Schuyler Swenson
This pop-up camp becomes home base for the team. There are archeologists, paleoanthropologists, geologists. They eat an early breakfast, hop in Land Cruisers and drive into the hilly arid landscape to begin the day's work.

Kaye Reed
We arrive at the site, which is not exactly at the site, it's at the edge of this basin and we get all of our equipment out of the car—the cameras, our backpacks, our water, because it's hot. And everyone gathers up. And then, usually, I give directions. You know, "So, okay, so, today, we're going to go here. And this is why we're going here. This is our best chance of finding a hominid." And then we come down into the basin. And this particular basin is a pretty steep trail, it's an old camel trail. Everyone sets down their backpack and gets to the business of starting finding fossils and we go from there.

Schuyler Swenson
When the team finds a concentration of fossils, it's Reed's job to help identify them. She records what they find and logs their coordinates in a GPS device. In the days before their historic discovery at Ledi-Geraru, the team found themselves at an extra-exciting site.

Kaye Reed
They find ancient giraffe teeth. And by ancient, I mean, this thing is called Sivatherium. It was a giant giraffe. It weighed, probably, two tons. So we had giraffe teeth, we had monkeys from this locality, we have all kinds of antelope. We have pigs. And it's a very small area, about the size of a hotel room, like, sort of down on the slopes of this hill. So people had been going up the hill and then you could walk on top of this hill, which is where Chalachew was.

Chalachew Seyoum
I came across a hill and I just climbed and checked the plateau. And there's nothing there. And, just, I start to walk to the other side of the hill and the piece of the teeth is sticking out of the sediment, just caught my eyes. And it is really intact with a piece of jaw. And I picked it up and the piece is missing.

Schuyler Swenson

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Seyoum had a feeling the missing piece was nearby. He decided to keep searching for it before telling the rest of the team. He didn't want people to rush to the scene and step on the piece so he kept quiet. And then he found another piece.

Chalachew Seyoum
And when I put them together, they perfectly fit and just make one complete jaw, the left side of the jaw. So then I called Kaye Reed.

Kaye Reed
And I heard him yelling, "Kaye, Kaye." And, finally, he said, "Kaye Reed!" And I was, like, "What?" He said, "I think we have one."

Chalachew Seyoum
I knew it was a hominid, even before I picked up the piece of the jaw, I knew it was going to be very important.

Kaye Reed
Well, I knew exactly what he meant. "I think we have one." I mean, he had a hominid so I started running up the hill. Well, you can't run up this hill, it's so steep. So I crawled, like, the last couple of meters to get over the top so I could see.

Chalachew Seyoum
I was quiet, you know. Even I wasn't talking because I was very excited and surprised. Yeah, we made it, you know. The members of the project have been working in that site for more than 10 years and they didn't find any significant hominid fossils. That made me really feel happy.

Kaye Reed
He was standing there holding it in his hands and it's really the left half of an entire mandible. It was in two pieces and it still has dirt and the silt on it. It came out of a silt sediment. Everyone ran up there and I'm trying to say, "Don't step on it. Stay back." Because we have to look for other pieces and I'm trying to keep everyone back. But everyone was yelling and excited. They did stay back. It was great. But they were still jumping around. And it was very exciting.

Schuyler Swenson
After almost a decade of searching for hominid remains, the team's efforts finally resulted in something big.

Kaye Reed

No, we didn't have champagne. But we did send someone in to get beer, cold beer. Cold beer is very nice when you're in a very hot place.

Schuyler Swenson

They didn't only find a hominid, they found what looked like a species from our same genus, homo. And it was 2.8 million years old. The homo genus wasn't supposed to have existed that long ago. This genus is really the most recent branch of our family tree. It includes species like homo erectus and Neanderthals and, of course, us, homo sapiens.

Kaye Reed
It is homo because it has, what we call, derived features. So as evolution progresses, an organism, if it's changing or evolving, gets new characteristics. So those new characteristics are derived from the older species.

Schuyler Swenson
Older species like Australopithecus afarensis. The most famous fossilized afarensis was nicknamed Lucy. She was found in Hadar, Ethiopia in 1974 about 25 miles away from Ledi-Geraru.

Kaye Reed
On that mandible, I think there are 12 different features that are new features from afarensis as a group and are associated with homo.

Schuyler Swenson
They now need to figure out just how humanlike the owner of this jawbone actually was, and what this might tell us about the timeline of human evolution. Susan Antón is a professor of anthropology at New York University. She remembers, first, reading about the Ledi-Geraru jawbone in the journal *Science* last March. She says the big thing about the new jawbone is that it shows the human genus homo existed way earlier than we thought. That has some implications for what we think our first homo ancestors looked like.

Susan Antón
It turns out that the early humans didn't look very much like us. And it's been hard for us to, sort of, take that onboard and encompass that within our thinking about what it means to be human. Because, it turns out, that we're actually pretty remarkable in that, you know, we've got these really big brains, we've got these really tiny faces, we have these not-very-well muscled

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bodies. And we had this expectation that, as we went back in the fossil record, we would see many of those things in our early ancestors and we don't.

Schuyler Swenson
Turns out our human ancestors had much smaller brains, much bigger faces, bigger teeth, and more muscular bodies.

Susan Antón
The new fossil, which has been defined as being a member of homo, has some characteristics that are like us. But it also has some characteristics that are a bit more like Lucy. And so it kind of ties that common idea or that common hypothesis that Lucy's species was our common ancestor. It ties that species in with our genus more directly than it had been before.

Schuyler Swenson
The Ledi-Geraru jawbone tells us that our human genus homo started only about 200,000 years after Lucy. That's about half-a-million years earlier than we'd thought before. Antón says piecing together the story of human evolution is like trying to draw a picture from a connect-the-dots puzzle with a bunch of the dots missing.

Susan Antón
And you're not really aware of what the other points are going to be. And sometimes you put a point into your picture and all of a sudden the entire picture changes.

Schuyler Swenson
The Ledi-Geraru jawbone is that picture-changing dot. We're finding that our genus, homo, is a lot older than we thought. The earliest stone tools are a lot older than we thought. And so are a lot of behaviors and lifestyles.

Susan Antón
We have, now, more teams that are working in that time period. We're going to learn a lot more about what does it mean and who is making those tools. How many taxa, how many species were there of early homo. How did they differ? What did they look like? What were they eating? And so on.

Schuyler Swenson
Antón points out that this jawbone's also special because of how intact and well-preserved it is.

Susan Antón

And it's really important because the things that we had before, even the earliest things that we had before, they were really scrappy, little, kind-of-nasty pieces of bits and bobs that you tried to put together into some kind of a picture of what early homo looked like. This particular specimen is much more complete and gives us a much better picture.

Schuyler Swenson
It's now been two years since they found the jawbone. And Kaye Reed and her team are still finding more evidence of hominid life at Ledi-Geraru.

Kaye Reed
What we need are more definitive pieces of the skull, I think. We went back this year, in 2015, and we found three different teeth, none of which fit on the mandible, so they're different. But none of them belonged to each other, either, because of different wear. So there's four individuals from that locality.

Schuyler Swenson
Four different homo specimens at Ledi-Geraru, which means there's probably still a lot more to discover. That doesn't surprise Susan Antón.

Susan Antón
You know, when you read a book and you read a popular novel, or you read a textbook, it makes it sound like we know all of the answers and that we know all of this information. And the truth of the matter is that there is a huge vast wilderness that's unexplored out there.

Schuyler Swenson
Paleoanthropology is still a really young science. There's a lot about human evolution we haven't figured out yet. And the Ledi-Geraru jawbone brings with it more questions than answers. But that's exciting for Chalachew Seyoum.

Chalachew Seyoum
Most people question me, why does the general public care about this science? And, for me, I would say, it's just asking the same question, why we care about our grandparents, or great-grandparents? If you expand this question, it will be, where we came from originally. If you push that question, great-, great-, great-, great-, then it just falls on this fossils.

Schuyler Swenson
Seyoum plans to continue work at Ledi-Geraru and hopes to stay working in Ethiopia. He says, in the future, he'd really like to find a skull. For Origin Stories, I'm Schuyler Swenson.

Meredith Johnson
Thanks for listening to Origin Stories. Today's episode was produced by Schuyler Swenson. Our editor is Audrey Quinn. Music and scoring by Henry Nagle. And we had production help from Briana Breen.

Origin Stories is a project of the Leakey Foundation. The Leakey Foundation funds research into human origins and shares that information with the public. The Leakey Foundation also funds post-graduate education for scholars from developing countries through their innovative Baldwin Fellowship Program. You can learn more, and support science, at LeakeyFoundation.org. That's L-e-a-k-e-y, Foundation.org. You can find and follow the Leakey Foundation on Facebook and Twitter, too.

Thanks to Kaye Reed and Chalachew Seyoum for sharing the story of their amazing discovery. And to Susan Antón, from NYU. You can find links to more information about their work on our website, OriginStoriesPodcast.org.

Origin Stories is made possible by a grant from Wells Fargo Bank. Transcripts are provided by Adept Word Management Intelligent Transcripts. Their website is AdeptWordManagement.com.

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