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Oral History Interview with Louise Leakey

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Contact Information

Briana Pobiner

Human Origins Program

Smithsonian Institution

Washington, D.C. 20560

<https://humanorigins.si.edu/contact>

Transcript

Preface

The following oral history transcript is the result of a recorded interview with Louise Leakey on August 12, 2024. The interview took place remotely on Zoom and was conducted by Maggie Lemere for the Human Origins Program and National Anthropological Archives, Smithsonian Institution. This interview is a part of the Smithsonian Paleoanthropology Research Oral Histories Project.

Louise Leakey has reviewed the transcript. Corrections and emendations by Louise appear below in brackets. This transcript has been reviewed and edited for readability and accuracy by the Smithsonian Human Origins Program. The reader should bear in mind that they are reading a transcript of spoken, rather than written, prose.

Interview

MAGGIE LEMERE: This is Maggie Lemere, and today I'm here with Louise Leakey. The date is Wednesday, August 7th, 2024. And today, I am truly excited to have this time with Louise to conduct an oral history as part of the Human Origins research and oral history project being conducted by the Smithsonian National Museum of Natural History. And we're really quite interested in exploring Louise's journey within human origins research, including how it got a hold of you, Louise, and what some of the main questions are that have really continued to drive you, what some of the hopes and aspirations you have for the field today and for moving forward, and what some of your great influences have been in this journey.

And Louise is a renowned paleontologist, an anthropologist. She's a Nat Geo Explorer at Large, the [Director of the Koobi Fora Research Project], founder of Leakey Journeys, and a [research] professor [in the department of] Anthropology at the State University of New York at Stony Brook. So we're extremely grateful for your time and for your generosity and sharing, Louise.

And while so much of your family's journey is documented, I also know that there's probably just new ideas and new questions and your own experiences that I, as a colleague and friend, am just really excited to hear more about from you. So we would love to start by having you introduce yourself, and perhaps you can talk about what it means to you to be a human origins scholar and some of the questions that have just been really captivating to you while you've been on this journey. Thank you for being here.

LOUISE LEAKEY: Thanks, Maggie. So I'm Louise Leakey, as you've nicely introduced me, and I've grown up in Kenya. I'm the granddaughter of Louis and Mary Leakey, who set foot to explore Olduvai Gorge and really put Africa on the map with the discovery of *Zinjanthropus*, and I'm the daughter of Meave and Richard Leakey, who then extended this work into exploring the Turkana Basin and really made huge contributions with their teams in terms of the numbers of hominin fossils that helped us to look into this remarkable story of our past. And obviously, they worked with many different colleagues and many different teams of fossil hunters who, without their collaboration and expertise, we would never have found the fossils that have contributed to this story.

I now lead the Koobi Fora Research Project, which was established by my parents when they set off to explore Lake Turkana as part of the National Museums of Kenya. And I continue to work both with the

National Museums of Kenya with the Turkana Basin Institute, which has its academic home at the University of Stony Brook. I'm a research professor at Stony Brook University in the Department of Anthropology there, and I'm also a research associate of the National Museums of Kenya today. So with that, there's a lot of work that remains to be done, and so we continue with the work on the ground at Lake Turkana, each year exploring both the west side and the east side of Lake Turkana depending on the sites that we're working in, largely funded by National Geographic Society and other donors who support our work. And we are still looking for fossils that help us to fill in some of the gaps.

MAGGIE LEMERE: Thank you. There's so many places we could go, but in the spirit of this project, I was wondering if you could talk about what the big questions are that your research and your work at the Turkana Basin are really hoping to address through finding these fossils.

LOUISE LEAKEY: I think the big questions, there are many. Obviously, the sites that my team are working in date between 4 million through to the last million years in time. Depending on where you're working in the basin, it allows you to look at specific time periods. And so currently, we're on the east side of Lake Turkana, so sites there between two and one million years, of which there are not many questions, but there are many gaps in terms of the completeness of the fossils that have been found from there.

So while we work sites at three and a half million years, where there's obviously a lot more questions to be asked with regards to what human ancestors were present on the landscape in the Turkana Basin at that time that would complement the fossils that we know from that time period, so that's... In the north in Ethiopia, you've got *afarensis*. At Lake Turkana on the west side, we named a new genus and species, *Kenyanthropus platyops*, which was found in 1999. And we have found other things from sites on the west side from that time period, which we are currently working on as well, so that's a very interesting time period.

But where we are at the moment, as in this year, we are going back over fossil sites that were explored in the 1970s, again in the early 2000s. And if you wait another 20 years, new material comes out of the ground, so we're going back over those sites to re-document where things came from now that we can get much more accurate location data for some of the early specimens to help us improve on that record, but we can also try to find additional material from these same sites. And so that's a large part of what we're doing today, is going back to sites that were explored in the past to see if there's any additional hominin remains that have surfaced since they were last looked in.

MAGGIE LEMERE: Yeah, I think I was listening maybe to a talk you gave, and I think you talked about how the same sites also continue to produce new discoveries because of the continual erosion, which is really interesting that you could go back to a place that another generation was and find more complete evidence. But I guess in terms of these gaps, can you tell me more about them and what adding to the record, what that might illuminate? And yeah, I'm thinking about how rare it is to actually find these hominin fossils based on everything I've learned from you. And maybe if you could help contextualize what we have in terms of what we've been able to find versus some of what we want to know, if that makes sense.

LOUISE LEAKEY: Okay, so if you think about when fossils are preserved in the landscapes in the Rift Valley, these old lake basins, these deltaic lake margins or fluvial pans, the fossils aren't, or the bones aren't, often complete from any individual that died there, so they're very fragmentary. And so when we find a hominin, it's very, very rare that it's a complete skeleton. So you can't tell necessarily what a limb

bone or who it might belong to, and so to find associated cranial and postcranial, that dentition skulls with postcranial, the limb bones, for all of these different species that were present there, that would be an ideal situation. But that's not what happened, so it's very, very rare indeed. So when we find things, we're adding to this record. So there's still many gaps.

So, we may have a skull of a hominin, say [KNM-ER] 1813 for an example, that's a small little skull which has been called *Homo habilis*, which you find also at Olduvai Gorge, such as OH13 and OH24. We've got this similar [hominin KNM-ER] 1813 from Lake Turkana. We [still] don't know very much about that species. It is one of those questions- such as does it have a male counterpart? Are we looking at a female, for instance? You've got a species called *Homo rudolfensis* which, again, some people [still] refer to that as *Homo habilis*. And perhaps that is [a male] of OH13, or [KNM-ER 1813]. We don't have enough material to fully answer these questions yet.]

So again, you've got these little clues, but you don't, by any means, have the whole picture. And so the only way we're going to ever answer some of these questions that are pending is if we can find more fossils that help us to unravel the mysteries that we've created through the finds that have been made to date. And it takes long, long hours of teamwork looking for these things. And you may come up with a skull once every five, 10 years if you're lucky. You're finding isolated teeth or limb bones or little bits and pieces, but it's very rare to be able to make a major contribution to the field in terms of a more complete find, a more complete skull. And so we've really got to keep people on the ground, boots on the ground looking for fossils from time periods where we know some of these skulls that have been found in the past have come from because there is then a chance that we might be able to find some things that help us to look at those questions in more detail, if that makes sense.

MAGGIE LEMERE: For sure. And I'm curious, in terms of your own career, if you would want to talk about what some of the fossils you and your teams have discovered, and maybe more specifically what some of the insights those fossils have helped you have about our human ancestors. And then I guess even on another level, zooming out and thinking about the lay person who might even be even more of a lay person than myself, from your perspective, why is looking for this human evolutionary history, why that is intriguing and why it matters and why spending all of this time, just day after day, to maybe find something every five or 10 years, the importance of that for understanding our past and ourselves today? Two questions there that you could take either way you want, but getting into more of that context of what really drives this.

LOUISE LEAKEY: Sorry, Maggie, can you just repeat the question?

MAGGIE LEMERE: Sure, sure. So there were two options that I was thinking about, and one was you were talking about the fossils and how they help us have different insights. And the more complete of a record, the more questions we can answer. And I was wondering if you might want to talk about some of the specific discoveries that you and your team have had and what kind of insights that additional evidence is giving us about our human ancestors and our evolutionary history. So that was one.

And then the second question was, why does this all matter? Essentially, why is this important to try to fill in these gaps and understand?

LOUISE LEAKEY: Okay. There have been so many fossils that have been found through the years. These are the hominin fossils in particular. And for every species, there are obviously questions that remain. So

you may not have known what the foot of early *Homo* looked like, and yet so when you find the bones of a foot of one of these individuals, they allow you to carry on with some more in-depth studies about, say, the foot of *Homo* and how does that then compare to a foot of *Paranthropus*, for instance, which these are some things that we can now do because we've found fossils that make this possible. Obviously, a huge number of hours have gone into their recovery, and a lot more hours go into the study of the fossils that then translate into publications down the line and that allow us to then look at gait or look at muscle attachments, ligaments, and things like that. So it gets quite technical once you've got a fossil that's complete enough to be able to analyze that to degree.

So we've got nice new remains that allow us to answer questions that we weren't able to do if you went back to when the work started in the Turkana Basin. In addition, you got much better handle on the dates of many of these sites when they started working up there. In the 1970s, very little was known about how all these different areas were. There's been a massive effort to explore and collect the basin to help us to narrow down where we are in time, and so we were able to go back to the records of where things were found in the past and actually really refine the ages of these fossils that allow us to then say, "Oh look, this species really did coexist in the same paleo-environmental landscape as, say another," and what fauna, what different animals were associated with it on those landscapes. So there's many of these questions that we can then answer once you refine where these fossils are coming from.

We've got new skulls that have been found. Some of those have taken time to get published. It can be quite a few years between the date of discovery and the date of publication because so much goes into the detailed study of them once the fossil's been found and then excavated and then prepared and then often taken to get micro CT scanned. And then you've got to process those images to give you window into some of the internal structure, and then you can get the fossil described and published into Nature or another peer-reviewed journal like that.

But each of those fossils tell a unique and remarkable story, so I don't know specifically which ones we want to get into. But every fossil, if you look at it in detail, it helps us to learn a little bit more about that group of that species because it adds to the numbers of fossils that it is represented by, so to speak.

MAGGIE LEMERE: Yeah. And the- Oh, go ahead, please.

LOUISE LEAKEY: No, I was going to say and then why is it relevant, is your second question. I think the big question, why is this work relevant, in the sense that it helps us to understand the diversity in the fossil record if you go back in time in this part of the world specifically. We can't answer what was going on in other sites unless we go and explore them, but this is large part about where we actually come from. What was the journey of the past that finally eventually leads on to modern humans that, from both genetic record and some of the fossils, we believe to have emerged quite close to where we are working today? So that's the context. It's important to know where we as a species emerged from and what were the different hominins that shared those landscapes with us if you go back to three million years.

MAGGIE LEMERE: Yeah, and it seems to me like so many of the ideas have actually changed within a relatively short amount of time. I mean, it's all quite a relatively short amount of time, but the idea that there is this linear progression to actually recognizing through finding these fossils that there were multiple human species here at the same time and how did they live and what were their lives like and

the environments, those questions are pretty fascinating. And what were early *Homo sapiens* like, and why did we survive and the others [did] not?

And I'm curious, just maybe getting a little bit more personal with your own journey, obviously this was part of your family's work, but I think I read that you didn't actually have the pressure to take this on, that your family wanted you to choose your own path. And I read that you've been credited as discovering... The youngest person to discover a hominin fossil. But I'm curious for you, at what point did these questions grab you and did you decide, "Oh, I really want to do this for my life," and what that process was like? Because it is such an act of service and dedication to be in the field and to be talking and fundraising and to, yeah, to continue this legacy forward. So yeah, for you, what really grabs you, or when did that happen?

LOUISE LEAKEY: So yeah, I said really grew up joining my parents up at Lake Turkana during those summer holidays that... our school holidays when they could get some time to go and do their fieldwork and join other scientists who would come out as part of their team. We tagged along, so I really learned a lot about life in the field, vehicles, airplanes, radio communications, the risks, what can go wrong, and working with teams. You've got to be a real team player to work out in those very difficult conditions. So really grew up knowing that, but I had never envisaged that I would continue with that work necessarily.

The fossils that they were finding and that they were obviously terribly excited about never really grabbed me. I didn't really have any understanding of the significance or the importance. I much more interested in learning to drive Land Rovers and things that had more meaning to me at that age.

It's obviously a whole lot later once you start to appreciate the bigger questions. When you're involved in your own pursuit of knowledge as part of a PhD or some other investigation as a school project or as a university project, that's when you start to realize, "Oh, there are these gaps in our understanding, and it's quite interesting." So I think really much later, it was after I started getting involved for my own PhD research that I started to be much more interested in the hominin fossil record and part of the family conversations that the dinner table were often gravitated towards, the fossils and questions around them, which I obviously listened to a lot, but I didn't contribute too much to those conversations initially. I'm obviously much more interested in the field now.

And I think you also realize how little was actually known at the time they were working in these areas. I mean, when I was 12 and they were digging up the Turkana Boy, for instance, which is this complete *Homo erectus* skeleton or *Homo ergaster* from the west side of Lake Turkana. It's really quite complete. It's not totally complete, but that's a nine-year-old individual that died, possibly because it fell into a swamp, and that's why its remains are so well-preserved and that it's so intact. But they never knew what a complete skeleton of *Homo erectus* [looked like]. They didn't know what its femur looked like or its pelvis or, for instance, complete skull with mandible, so that fossil really contributed a huge amount to our understanding.

I had no idea that that fossil was so important and provided such so much information and context to that field at the time that I was on the ground with them. Now much later, I can appreciate why that was such an exciting find and why everybody was in such good moods in the camp that year. Because every time they went back out to the excavation, they were finding more of the skeleton. It's very unusual when you're excavating that you find more and more of it so often, and that you start to build up this complete skeleton. So that was a really important and exciting find that gave tremendous insight into that particular species. So yeah, I think it's really much later in time that you start to question or want to find answers to specific questions. It was much more just being in the field and loading the trucks and driving the Land Rovers and helping find the fossils.

It's a lot of fun being in the field as well. It's a real team effort, and there are many, many fun stories from being in the field and in the camp with the field crew. So it was always a very enjoyable time, being part of the team or tagging along, but I didn't really appreciate quite the significance and importance of the work that was being done until much, much later when I started to get more involved in that myself.

MAGGIE LEMERE: I think you've mentioned to me, and it was a fun surprise, that you were considering marine biology at one point, and then you ended up switching directions. I was wondering if you wanted to talk about that and also your PhD and what those questions were that you really started digging in on when you started your career in human origins formally.

LOUISE LEAKEY: Our holidays, especially the Christmas holidays, we would end up on the Kenyan coast. We used to spend a little bit of time collecting plankton in nets and looking under microscopes at the things we'd caught in our little glass jars. So I always loved the marine world, and I always thought it was a scientific pursuit that you could learn something and you'd be collecting new data and learning things in an outdoor environment. I never envisaged myself as academic in a university. I always wanted to be able to spend time in the field getting my hands dirty or being on the ocean or doing something that made sense, or doing something for the planet if you like. So my marine science interest, I think, probably began there [exploring the diversity of] plankton [under the microscope.]

So I thought marine science would be a great career to get involved in, and I went from my biology degree to try to get a place at a marine science, or on a marine science university course and ended up at UC Santa Cruz for a few months there. But I was converting from the British education system to the American education system. That wasn't such a smooth transition. You had to do all these prerequisite courses before you could get onto your courses that you felt were relevant to your own interests. I had to redo maths and chemistry and biology, and I'd already spent a lot of time doing all of that. So it was a very expensive place, to be at university, but I had to repeat a lot. So I decided that actually, I would reapply to British schools down the line and went to the University of Bristol to do biology again. And then I got involved in a geology joint honors program with some biology as well.

So that was the background. My interests were very much in marine sciences. But then the year my father had a plane crash at, it was 1993 and I was actually at university in England at Bristol University at the time. It was about a week or so before the end of the academic year. I was doing my exams at the time, so I had to finish those before I came back to Kenya. But he was clearly in quite bad shape. My mother had to then travel to England with him for medical reasons, obviously. So she then asked me if I would then lead the expedition that she'd just got set up at Lothagam. Which is a wonderful fossil site on the west side of Lake Turkana, which goes from 8 million through to [4] million or thereabouts.

So Lothagam was a wonderful, rich fossil site that was going to provide a lot of years of field work. But she had to then leave, so they needed somebody to be on the ground with the team. So I was then asked to see if I could go up there, join all the foreign collaborating scientists on the ground, keep them posted. This was the days pre-cell phone so your communication with the outside world was through a HF radio. Which you had a little aerial sort of slung between two trees. You then attached your radio to the car battery. You'd have to sit there and try and get a little gap in the other people that were on the radio set to connect to an operator in Nairobi. The operator would then make a phone call, link you up with the phone call to get some news from Mum or somebody in the UK where they were having the operation. So it was very hard to get any information. So we obviously out in the field doing the work, not really sure what was going on overseas but knew that he was in safe hands with doctors and my mother was there.

So we were working Lothagam. We explored another site which had to cross a river to go to, Nakoret. But it was a wonderful time to be working with the field team, really in a position of responsibility. I was age 21 at the time.

Once they got back, my father had had a double amputation of his legs below the knee. It was quite traumatic, quite alarming to see how he'd pulled through. What that actually meant for his lifestyle in terms of... To lose your lower limbs had a major impact in terms of what he could and couldn't do. So I then spent a lot more time helping my mother, Meave, with a lot of the logistics of running the field camps. That's really what got me more involved in the field. Less so the fossils and more the logistics of running the camps and cars and flying the planes and all of that side of thing.

But if I was to ever be in a position to apply for my own grants and to lead these expeditions, it was clear I was going to have to get a PhD. So my undergraduate degree, which I completed in 1995, took a bit of a gap after that to do some other work. Then I was persuaded to then try to get a PhD position. Which I then ended up applying to University College London for my PhD studies, which then took a further three and a half years there.

So with that under my belt, then I was able to co-lead the expeditions with Meave to Turkana. We were supported by National Geographic in terms of funding our grants. We were also given positions as National Geographic explorers in residence which provided some leverage in terms of applying for grants within the Society. National Geographic had a huge amount of field work over the years and were interested in sustaining that. Because they wanted to support field work and field workers and scientists who were working in this region and still coming up with new finds.

So with that, we've continued with the work together, we co-led the expeditions. Then in more recent years I've taken over and run the expeditions, obviously, with a new team of fossil hunters. But it's a very multi-generational effort to be fair, Lake Turkana and in East Africa. But it is teamwork, it does involve many different players.

MAGGIE LEMERE: It's just incredible that-

LOUISE LEAKEY: Dead bolt there.

MAGGIE LEMERE: Oh, it's okay. But at 21, you were leading a field season and I was just curious how that felt and what that moment was like? It must've been a mixture of feelings and emotions with what was happening with your dad. I was wondering if you could bring me back to that moment, and maybe your childhood kind of prepared you for it. But 21 is really young, so I was just curious.

LOUISE LEAKEY: It was a very difficult time. Obviously it was very shocking to learn that my father, who I always thought was invincible, had been involved in a plane crash, amazingly he'd survived. So I remember that being a very frightening piece of news. Then knowing that they had to go overseas and that they couldn't save his legs, that was tough to work out. So I had to just get on with it. I had to step up and help. There was nothing else to do and I wouldn't question that.

But I do remember, I think I did 13 different trips by road from Nairobi to Lake Turkana driving supplies and people up and down to camp. I got really tired, I do remember feeling absolutely exhausted. I'd lost a huge amount of weight that year as well.

Remember that when my father came back... I think he'd had 13 general anesthetics and he came back and we come down from Turkana to Nairobi to meet with him. He'd had enough and he said, "He

wanted to come back and to reconnect with home and people. That he would then go back again to finish the operations afterwards." So met him in Nairobi. I remember going to the airport and going up inside the terminal, I think we got passes. He was in a wheelchair in great spirits. Mum was behind him and he was making light of quite a serious situation. Had one leg amputated and the other leg was still there, but with all the [external fixator scaffolding holding his foot and his leg together]. He looked so gaunt and my mother had gone gray. I was appalled at how much they changed in that period of those few months. Felt quite helpless and relieved a very, lots of mixed emotions, obviously.

I caught up with him for a week and off they went back again to do more operations. He basically [made light of his situation], "He'd had enough of operations for now, but the only thing to do is to go back and put a machete to the next leg and he'd be home soon after that." He didn't want anybody to worry about him. He didn't want anybody to feel any sympathy. He wanted to lead and to get on with it. He'd survived. What he was frustrated was that he couldn't get back to work again. So the quickest way to do that was to go and have the other leg [amputated], which was going to take months and months to fix [otherwise]. So he decided to get that done and come back.

Then when he came back, he had learned to walk and he had then learned to drive a car. He actually flew a plane again. He had his prosthetic limbs on, he looked just like he always did. So you didn't realize that he didn't have the same ability that he had before. But so in some ways he kind of masked those problems and we just carried on with it. So I think it was a very much a family... We all had to do our bit. My younger sister had gone over to help them in England. I was then leading the fieldwork. Mum obviously was by his side every step of the way, because it was a very complicated medically for him. So yeah, it's a real family effort to get him through all of that and to continue with the work that year.

To be honest, without the amazing support of the team on the ground, the fossil hunters, who led by Kamoya Kimeu, who was like a second father to me, he was so good to me in terms of keeping things in order on the ground. He was a major part of all of that. Other members of the team who continue to work and find the fossils and keep our spirits up. I think everybody played a major part in that and has done over the many, many years. It really isn't down to one person, it was these amazing teams that made the magic happen and who still make the magic happen, frankly.

MAGGIE LEMERE: What an incredible set of experiences and model of a parent to just... I'm really struck by the idea that he just wanted to have his leg amputated so he could get back to work sooner. It sounds like he was just such a passionate person. I know he became really passionate about wildlife as well. It's incredible. You were explaining that you went from this field season and eventually ended up deciding that, "To do more than the logistics you would have to get the PhD." What was that like to make that decision to really commit to this path? Do you want to talk about those years of your PhD and what you researched? You described it as, "A moment of a really deepening interest in the questions."

LOUISE LEAKEY: So, the thing about PhDs, firstly, once I'd got my undergraduate degree [from Bristol University], my parents said to me, "Well, if you want to carry on, you're going to have to find the money to do that." They couldn't support me further. So I applied to UCL and I applied for some funding to get that PhD covered, the cost of it covered while I was there. I didn't get the support. Then I think somebody at the last minute didn't take the scholarship and therefore they then offered it. So it was a quick decision to then, "Okay, I can do this now, let's go do it and get started." So I had a scholarship to do that at UCL.

Obviously the questions, I wanted to do something that was relevant to Turkana. So I came up with various questions with the support of some of the collaborating researchers that I had got to know over

the years. So Craig Feibel, for instance, guided me into trying to explore what the fossils, the fauna, the different animals were. What signal they were giving us in terms of habitat in the Turkana Basin between 4 and 1 million years. Could you pick up from the fauna whether there was a drier, cooler [period which would be] represented [in the] fauna with more grazing animals? Or a time when there might've been different fauna present that might be indicative of say, wetter, more humid time, in the fossil record. So there were some very broad questions that they suggested I might try to then explore.

So I wanted to do my own field work. So I did some time with the team on the ground trying to collect additional fossils. So we went exploring sites on the west side of Lake Turkana. Had a very small team with me, we had a Land Rover a very wet year, and we went up and down these dry sand rivers that were very wet that year and we got stuck often. We found some little fossils. It was the same year that Mum's team also working on the west side, but to the south, they were working in a site called Lomekwi. That was the year that they found *Kenyanthropus* skull. I was working further north on some of the slightly younger fossil sites with my team. We literally were sleeping in the open on bedrolls by the Land Rover. Then we'd move to another site and we would do the fieldwork that way. Then we'd come back down and join the bigger team there where my mother was working in Lomekwi. So it was a really fun field season where I was collecting some new material that could complement the collections in the museum.

Then got with what I had, the species or the group that would be more helpful to look at what was going on in terms of the paleoenvironment were the antelopes, the bovids. So having got lots of isolated bovid teeth in my collection, I thought, well, I wonder if there's any way you can work out what tribe these different teeth belong to? Which you can do from dentition. But then you can't really narrow them down to species unless you've got horn cores associated with the teeth. So it was kind of a question I then thought it might be quite interesting to take this PhD in that direction. How can I use the antelope teeth and do a bit more with them?

So I then decided that I needed to be able to estimate their body weight. Because if I could estimate their body weight, maybe I could divide those different teeth up into body sizes. So I ended up the second year of my thesis collecting a whole lot of different data. Which enabled me to develop some regression equations to allow you to estimate body weight. I did that by going to a game ranch just outside of Nairobi where they were actually culling live antelopes or bovids. There were oryx, there were hartebeests, there were impala. There were other antelopes which they were killing to feed into consumptive wildlife utilization effort. The Carnivore restaurant is a really famous restaurant in Nairobi where you can [essentially taste the animals you have seen on safari] "Oh, I've seen those zebra out on the plains now want to eat one," kind of thing.

So they were [supplying] The Carnivore Restaurant [with animals culled on the game ranch]. So I thought, well, here's an opportunity; I can actually go out to the game ranch, I can identify the animal. See if it's a male or it's a female, get an actual weight of the animal at the time that it was killed. Then you could get a weight [once it was cleaned up. Then I could sex it, I could age it. So you get really much tighter regression equations using these data]. How would you estimate the body weight? Knowing the original weight of the animal and getting different measurements from their limb bones, and teeth.

I'd pursue these bones, having labeled them as they left the game ranch, all the way through the restaurant and out the other side. Where I [would] then salvage them [still with my numbers attached], then clean them up and then take a whole lot of different measurements from those bones. Which then enabled me to develop my regression equations. Which I could then, long story, come back to applying to the fossil record to see if I could actually work out the different species.

So the kind of PhD took a different line at that point. It was a combination of the fossils and the modern body weight regressions and body size estimates, which it's quite important data. Then [I applied the

data to] the fossils and tried to answer my original questions] -could I actually identify a period of change in the paleoenvironment at two and a half million years, as proposed by Liz Vrba [as identified in] the Southern African fauna. I was able to spot a much stronger signal at [1.8] million years [by identifying a change in the different ungulates present at that time from the [fossil] record [from the Turkana Basin].

So it's a really roundabout approach, but as for all PhDs, they start out with a question. You have the [freedom] of [researching] a topic and it leads you [down] all sorts of different burrows and tunnels. You then start to ask a question and try to find answers to it. I'm not sure it was ever conclusive. But it was a real luxury to be able to spend that long studying a topic. You get very isolated in some ways because that's all you do every day. At some point you've got to say, all right, I've got to write this up and submit and try and defend the thesis and get your PhD, because otherwise you do it forever.

So I wrote that up, submitted it, and got the doctorate. Then was able to then pursue certain things, questions thereafter and continue with the work. That's when I came back and then started to do more joint field seasons with my mother. But again, for many years I was often on the logistical side of the field work. Obviously collaborating with many of the scientists that were coming out and getting more involved in understanding the collections and the hominins and the other animals that we were collecting day to day. So yeah, it all leads into many different directions, this fieldwork. But the PhD had to get done to then to be able to co-lead the expeditions and lead the project going forward.

MAGGIE LEMERE: I loved imagining you trying to get the full process of the animal on the other side of the restaurant. Just sounds like this ultimate detective work that you were doing. I was just thinking you're like a detective and a storyteller. I was remembering how you said, "You really enjoy the process of...", I forget the exact terminology or language, where you're putting the skull back together piece by piece. Just these puzzles, these giant mysteries that you're getting to lean into. It just sounds like you've been doing that now for quite a while.

But also it's interesting to me that even after the PhD said, "You were helping a lot with the logistic side." I know you'd had so many incredible scientists around you your whole life. Did you have to grow your confidence in a way, that you were also going to be a major player as a scientist? Did that happen gradually over time? I can imagine being around so many incredible people and even having this incredible family lineage, that it could be, perhaps intimidating. I'm just curious how you came into yourself in that next role as the lead scientist.

LOUISE LEAKEY: I think very much so, I've always enjoyed the field work, always enjoyed the teamwork and I still do. Now I'm in a position where we've got fossils, we're trying to get them published, trying to get [them described and make] sure that we tidy everything up so that someone coming after us can carry on with this.

There's been so much data collected over the years, and some of it's in [notebooks and hard drives]. There've been many scientists who have been part of this. Suddenly they're not there anymore. When they go, they leave a lot of unfinished work and a lot of unanswered questions. Life moves fast and suddenly you think, oh my goodness, I'm now holding the mantle and time's not on my side. We've got to make sure that we train up the next generations to understand all that's [happened to build this knowledge]. How this has happened over the past. Make sure the records are intact and somewhere and that someone else can come along and pick up where we left off.

So yeah, I think you don't really realize that you are that involved and that committed until you suddenly are. When people aren't around anymore and you [find that you are] the only link to the records in

some cases. The data that was collected and the field notebooks and the photographs. Now you've got [access to] that information no one else does.

So I find increasingly that I'm in a position where I've got to try and put that down somewhere that someone else can find at some point. So that changes quite quickly and I don't know how to describe that. But you take so much for granted that you think the people that you've always been with you think are always going to be there and then they're not.

So it really is important that you turn from being mentored to becoming a mentor. Trying to make sure that other people know where these records are and that it's safe and secure for future generations. You've seen that happening with people who suddenly are no longer with us.

Glynn Isaac who died, he was a wonderful archeologist, geologist at Turkana. I remember him... It must have been in the '70s or early '80s when he passed away, and I always thought Glynn was always going to be around.

Then Frank Brown died a few years ago and with him went a huge amount of information that he was working on with regards to the stratigraphy and the chronology in the Turkana Basin. All where he collected various tuffs and where these different samples came from, where these different sections were drawn up. He fortunately spent some time with Patrick Gathogo, who's a Kenyan, who did his PhD under Frank and knew a lot of those records. But if it wasn't for Patrick, so much [more] would've been lost there.

Now what happens once Patrick's not there, or what happens when I'm not there? This is suddenly you've got a real big issue. We've got to work together preserve that information, because you don't want to have to reinvent the wheel again. So much information has been pulled together over the years and it is going to disappear if we're not careful. So with all these new techniques, obviously the new ways of recording things, is what you're actually doing here in terms of capturing those stories. I think many of us need to work with the few people who are still with us, who've been part of that journey and try to get that information from them. At least make sure that it's in some repository that other people can get hold of in time because so often I think now, "Oh, if only I could ask my father that question," and he passed away in 2022, or "If only he could ask Frank where he saw this," and he is not here to ask. So we've got to go and work it out ourselves again now.

MAGGIE LEMERE: That makes a lot of sense that it's a natural progression. But yeah, that time moves really fast and you're kind of in that role before you even know it. And then you have this, it sounds like, just responsibility. I think about that at the Natural History Museum where I do the oral histories around the collections and just this idea that this is our human heritage and these people are safeguarding it and protecting it for all of the stories that we have yet to learn and know. I think before I started doing the oral histories, I really didn't have a sense at all of the collection or what they could tell us about ourselves and our planet. And I think, unfortunately, a lot of people don't really realize what we have and what we're still finding.

On the role of mentorship and kind of getting back into your progression of finishing your PhD and going back to the field, it sounds like you were working with your mom a lot and that she was also an incredible teacher and mentor. So I was wondering if you wanted to talk a little bit about some of those chapters of work together and what you were discovering and what it was like to work with her.

LOUISE LEAKEY: My mother has been a great friend, obviously, and mentor to me over the years, as well as being a wonderful mother. Allowed me to really follow my own interests and paths. We always had a lot of fun in the field together. We'd get up, go for an early morning swim in the lake before it got light.

There were always many laughs during the day and many fond memories of my time doing fieldwork with her.

But she is a really exceptional scientist as well. She is a specialist in monkeys. She knows her bones inside and out, and while we were collecting fossils, we'd obviously be able to talk about them and try to decide what agree on certain things and that we were collecting. So we'd work together on that with other members of the team as well.

I remember a wonderful story. In the year 2000, we were out a long day, a long morning collecting fossils that the team had found and we were sort of going from discovery to discovery. These are, whether they were pigs or antelopes or monkeys or whatever was being found, we obviously had to, once something's found and they record where it is with a GPS fix, you have to get back to the site to then collect it. When you collect it, you write a collection slip and you put it on an aerial photograph or try and take a GPS fix, which those times weren't particularly accurate because that was early days of that technology.

We came to an antelope juvenile and there was bits of foot bone and some teeth and Kyalo Manthi, he was head of the Earth Sciences, now is head of Sites and Monuments at the museum and he works at Lomekwi and other sites on the west side of Lake Turkana today. But he was actually with us in the field that year and while we were collecting the antelope, which he had also found, he said to my mother, "And there's this thing over here. It's an ear and you see the ear canal." And I remember her saying, "That's a very big ear and there's only one thing that has an ear of that size."

I could just see this going through her mind thinking clearly this is something quite important. It's not just another monkey because the antelopes don't have an ear hole that looks like that. It had to be primate. And if it was that big, it had to be a larger, higher primate, and therefore it was clearly going to be a hominin. And so our thought that we might get back to the car to get a drink of water, this is about 12:30, we were thinking we'd collect this one last specimen, and I don't think we left there until 4:30 that afternoon because we then proceeded to dig this thing out in this block and take it back then in a basin, in a big large [sandstone] block to the car.

That then turned out to be this beautiful cranium without the face once it was cleaned up months later from that site. It was amazing. I'll remember it very [clearly] and I'll never forget her sitting there saying, "This looks really interesting. This is going to be a very exciting find." Which it was. It was this little skull of *Homo erectus* that ended up on the [cover] of Nature. KNM-ER 42700, was the number of that fossil. So yeah, these things, every find is this amazing story and it was always so much fun finding them and collecting them.

Not many people can sit in a hole with their mother and dig up a fossil human ancestor, that's never been seen before. It's a truly amazing experience that I think probably one that only I could ever say that I've done as there are not many mother-daughter teams out there. We had a lot of fun excavating carefully the sediment away from the skull and the team putting it through the screens. [Back at the National] museum [in Nairobi], and Christopher Kiarie carefully cleaned it under a microscope with a fine air scribe. Then we could finally see what the fossil actually looked like. It's not until you get the fossil back [to the lab] and months later that you get it cleaned up that you can actually [fully appreciate what] you've found. You don't do the [detailed] work on the ground in the field necessarily.

And on that [excavation], we had a satellite phone with us and I remember was us calling my father in Nairobi and saying, "We've got this fossil." And he was telling us exactly what [he thought we were digging up] - but we said to him, "[How do you] know what we've got. You can't see it [where you are?]" . But he [liked to be] very involved, although he wasn't with us [on site]. He was as excited and involved from a distance. And so those were really fun years, that we were all excited finding new fossils that were going to make a huge contribution to the field in terms of information, new information. Some of

those fossils are still under publication today. They've taken a long time to get described because they're incomplete, and so it's been quite hard to work out whether they belong to *Homo habilis* or *Homo rudolfensis* or to something different.

Again, we need to find new material to help us to build out the sample size, to get us into a position where we can really begin to work out what the whole range of fossils actually are that are present on the landscape in the Turkana Basin through time. And so, to have been able to do that with both my mother and father who clearly had such an amazing time working together on these things and to have being able to play my little role in that, although they were very much in the lead and the experts and I was always taking much more of a back seat, trying to keep the expeditions running and going and supplied. It is much more in the recent years that I've got more involved in the scientific side of this because I've had to really pick up those reins as well.

MAGGIE LEMERE: Yeah, that is just so incredible. I love that it's you and your mom are the only ones who to this date have that claim. But maybe with all of the people that you're training, there'll be another duo to come. There's also just something kind of sweet and surreal about a particular mother-daughter relationship while looking at the evolution of humanity. That kind of strikes me. I'm not sure if I read this correctly, but is it true that you're still going back to some of the same sites where some of those earlier discoveries were made to see if you can find more pieces of those specific puzzles of those same fossils?

LOUISE LEAKEY: Yeah, we are now going back [over sites that were worked in the past]. Having found [notes written by] some of the scientists that were working up there in [the 1970's. In those days] when they found a fossil, they didn't have a way of recording [its location] using a GPS. So you had to find a clever way to make sure that somebody coming back 50 years from [the time] they found it, could actually [get back to the original point] where they'd found it on the landscape.

They used aerial photographs flown from an airplane, where you would work out where you were on this black and white photograph from of a fork in a river, a black hill or a tree. The photographs represented about 7 square miles or 7x7 miles on one picture, and you would then push a little pin through and you would then write a number on the back [marking the point a fossil was collected from]. "Okay, that's where that fossil comes from." But that pinprick might represents about 50 meters on the ground, so it's kind of vague, and sometimes those pin pricks were in the wrong place.

[Fortunately], they also took either a Polaroid [picture] or a black and white film picture of a man holding a staff or a stick at the point where the fossil was collected from. So we have a photograph that you can then try to recreate today that would show you much more precisely, to within a meter or so, where that fossil was found. And so what we've been doing is going back with those early photographs, which we've got on the iPad now, and trying to recreate the exact spot that the fossils were found in. We've been obviously using the aerial photographic points as well as these photographs so that we can then get GPS position for the database.

And so, in doing that, we were able, this year, to find the site where I described the fossil with a big ear earlier in this interview that my mother said, "That looks like a big primate's ear." That fossil, that skull, which didn't have a face and so therefore didn't have any teeth, so it was quite hard to get an idea of how old that individual was at the time that it died, it's actually looked quite young because some of the bones of the skull were not fully fused, we've now worked out that it actually comes from the same horizon and only 6 meters away from where a lower jaw was found in 1971. And so that lower jaw has all its teeth and clearly it belongs to a very young *Homo erectus*, and so we can convincingly say that that

fossil was associated with this one. So we're able now to republish them as a single specimen, although they've already got two different accession numbers, but we were only able to work out that they belong to the same individual earlier this year.

So in that respect, it's been very successful going back over these sites and there may be that we'll find a couple of other surprises as we continue with this work. But it's part of our effort to try to bring up to date the record of all the hominin finds that have been found in the Turkana Basin since the 1970s right through to date and try to put those records in, perhaps, a monograph, get the specimens digitized, 3D models of them, and make sure that the archival records are digitized as well, so that all the information is in one place for somebody who wants to pick up and see what has come before and what the whole sample is. And also to make sure that things that have been found are actually finally published. Because there's a lot of things that have been found and have been given to different scientists to work on for publications, but they've not been particularly fast at getting them out. We've really got to get this [material] out and published and done, because as I said to you, time's not on our side.

MAGGIE LEMERE: That's incredible. Listening to you speak, I was just struck at how many different things you could possibly be doing in a given day or year, all of the different types of research on the ground in a place that's as productive, I guess you would say, as the Turkana Basin, like the digitization work, the publishing work, I know there's fundraising work, training for this new generation. I'm just curious how you think about prioritizing when there's so many things, it sounds like, that are there to be done and how you're holding all of this.

LOUISE LEAKEY: Yeah, it's hard to prioritize, but I think that we've got to keep the field work going, so we still got to go out there and find new things. Because if fossils come out of the ground and you don't find them and pick them up as they're emerging, then you're going to lose these fossils. So you've got to make sure that you keep boots on the ground finding new [fossils] because that's important. That's important for humanity, it's important for the science, it's important for the field.

It's also important to train new people in terms of the work. And so not only at the level of the fossil hunter, and those now are the team built from people drawn from the local communities because they're obviously going to be better custodians of protecting these sites if they're people from those communities who know about them and are involved not only in finding them but in them working on them down the line. University students who, again, some who've come from those local areas who are now coming back and they're actually now in a position where they can lead the projects. And that's a major milestone if we've now got students who can carry the torch going forward, who really started from the beginning, started as fossil hunters or as interns and now got master's degrees and going on to do PhDs. And hopefully they can get back into either the museum system or into different research institutes to then carry on with this and train future generations.

So that's a real responsibility, and I think if we lose sight of that, then we've failed. And so while it's important to keep finding the fossils, it's really important to start to pass on the mantle and make sure that you've got trained Kenyans or trained East Africans who are there to lead these projects going forward and who can ensure that this region is kept safe in terms of that heritage.

And so, in that light, that was why my father decided that he would establish the Turkana Basin Institute, which was to try to provide a center where there were facilities on the ground at Lake Turkana where people could come and launch their field expeditions from, but also where collections that were made could come back to where they would then translate into jobs where the fossils would then be cleaned and accessioned and digitized and described. And that becomes sort of a safe house that is in

collaboration as an extension of the National Museums in terms of they're national collections. These aren't collections that belong to individuals, they belong to the country. But in some ways, he always felt that if the collections were made at Lake Turkana that they should remain up there so that people wanting to study them would come back into that region to give back. To give back to the community, to train people from those communities in terms of how to describe fossils, get them onto publications, get them to lead the next expeditions. They're the ones who are finding the fossils as well.

So it was the next obvious step, was to try to build infrastructure in the north of Kenya, both on the east and the west side of the lake, to enable this work to continue with the human origins as its central focus and to provide a safe place to store collections to a very high standard. And so that was what he spent a lot of time and effort raising the money for. We were all involved in establishing the institute, training people, oversight for the collections. I've personally spent good 20 years on that and it's happening and lots of people are using the centers for work, and although now it's branching out into other areas of inquiry as well, its main focus was always to center around the field of our human story, our past, whether it was geology or archeology or human prehistory or the other fossils that we lived alongside or our ancestors lived alongside.

So that was the focus of why the institute was established. And hopefully if we can raise the endowment to make sure that these facilities will then exist in perpetuity, that they will continue to be used in the pursuit of this scientific understanding or knowledge and that it becomes the place where you go if you want to know about what happened in the past at Lake Turkana, the historical documents, and that you can find where all the papers are and that you find people who know where certain things were found because they've seen things firsthand. So that's really the reason that was established. So he was always somebody who really thought about the big picture and thought ahead in terms of what could be built that would make sure that this was there for future generations. And so it was a very selfless task. I mean, it took a lot to get that established and it's been a success.

MAGGIE LEMERE: Yeah, it's so important. I was just thinking about visiting the Olduvai Gorge recently and just how now there's young Tanzanian scientists who are telling those stories and giving the tours, and you can really see that change over time and how the resources have been built up. I guess I'm curious more broadly how you've seen human origins research change since you started with your PhD or even before. How maybe different technologies, different best practices, and what you think is important to keep and maybe also what you're excited about for the future, on topic of thinking ahead.

LOUISE LEAKEY: I think there's been a lot of advances in technologies in terms of imaging, to apply to the existing collection of fossils that we have. If we can scan them with micro-CT scanners or with the synchrotron imaging facility you can get a whole lot of new information from the internal structure of fossils in the existing collection, how these different species changed developmentally as well from these additional teeth that are unerupted and therefore hidden. With high resolution 3D scans, you can extract those teeth digitally so you can add to your sample size, by using technology to do that. And that obviously wasn't possible back in the day. You can also look at chemistry of some of the bones, to try to get different insight into the deposit they were preserved in, how they were preserved.

In addition improvements in GPS has impacted in the accuracy of recording where things are found. The fact that you've got digital cameras or digital images that you can take on your phone with really accurate location information is transformational. Drones also allow you to get really good aerial imagery, which is a helpful tool for mapping. There's so many new techniques, so it's a really exciting field in terms of where things are going.

I think there's a huge amount that's going to be learned from the existing collection, but also in finding new specimens, using new techniques. Although, we will always need to have boots on the ground to check things, but at some point you probably could sit in your armchair and browse through images that are being gathered by a drone that's flying a pre-programmed route in an area that you think hasn't been explored. You could literally send a drone out, take the high resolution images to search through, perhaps with machine learning, and then the team in to check a location. And we've tried to do that to some extent with a citizen science project we set up a few years ago called fossilfinder.org, but I'd make a bet that going forward, imagery is going to get to the point where that's going to become increasingly possible to improve on the more systematic way of looking for things.

So technology is really interesting. I think the biggest advances are probably in the space of imaging in terms of what you can do with that, but also in terms of collecting chemical data of fossils, which allows you to then narrow down where certain fossils are coming from and which time horizon. I think also the dating techniques are improving as well. As you'd expect, these things, there are more and more people working on them, and it just helps to push the boundaries a bit for this field, which is exciting.

MAGGIE LEMERE: Yeah, all of this new tech. The idea that someone could be sitting on their chair, you were saying, basically, almost have the benefit of having a collection is pretty incredible. But I was also thinking as you were talking about all the digitization that you're doing and how that also connects to access, because that experience of finding something like a hominin fossil or being in the field, hopefully there'll be more and more people involved, but will still be in the relative few. It seems like a public outreach and education is one of your passions or one of your roles, at least, with your work, and it connects to the digitization. I was wondering if you wanted to talk about that as well.

LOUISE LEAKEY: Yeah, very much so. You find these fossils and you write all these papers about them, but if you can't share these finds and make the field more meaningful to the public at large, then I'm not sure what the point of it all is. So, I think that's one of the things we've really got to work at and do better, is making the fossils, even just as 3D files and related information accessible not only to scientists, but to teachers and to students and enthusiasts around the world who might ask the question about where do we come from? Armed with the information you might then consider the fact that we have never been a single species on the planet in the past before, so why is that different now, and what does that say about what future might hold? So it's important to make these collections accessible. One of the things that I was working on was, a few years ago, was a project to use photogrammetry to digitize and make downloadable 3D files of some of the skulls of animals, and humans, and human ancestors, and tools, and to make them freely downloadable for education, not for sale or commercial interests. This meant that the files and information could get into classrooms as 3D printed models or as cardboard cutout models, so that you could then learn about their discovery and explore why these looked different to modern humans. Information also included their age, and how they were found. It was exciting to share these fossils with the public at large.

So we developed a website, called AfricanFossils.org, where people could download the files and could access the information. That website needs a lot of work now, it needs an overhaul or to be merged with other digital repositories. They're much better ways to view these files now. I did a lot of this initial work with the Smithsonian Institution and Autodesk, and in fact the Smithsonian have really made huge contributions in this area in recent years. For a while it was a really important resource, for many students and scientists.

The other thing we are working now, in partnership with Jeniffer Kamoya, who is Kamoya Kimeu's youngest daughter, is developing children's stories about the fossil discoveries in East Africa. We met

after our respective fathers died. And she remembers being read many stories from Turkana and the North, about the finds that were made, and the snakes, and the scorpions, and the crocodiles, and the lion kills, in letters written by her father to her mother. But she had never spent any time on the ground. Today we are a team we now co-lead the team of fossil hunters at Lake Turkana, and we've now got women on the team as well.

And so as I said before, it's a multigenerational effort. So she's very much part of that effort to educate Kenyan youth about prehistory, and with her interest in developing these stories about how these finds were made so that we hope share many of these stories with kids in classrooms. So she's leading this project to now producing printed books that we can then distribute to classrooms and possibly get into the education system so that it can bring these stories to life for East African kids. We also hope to develop these outreach activities further in the coming years.

And I think that's something we haven't been very successful at yet and I think that's something that our generation need to do, especially now that we've got access to internet and to smart phones, and there are opportunities to share stories with every person on the planet if we wanted to do that. So I think our biggest challenge is to improve on how we share this amazing story of our past. We have an obligation to do that and make this a big part of the work that we do. This science needs to be exciting and relevant to people that come from the areas where we work as well.

The first story we published coincided with the anniversary of the discovery of the Turkana Boy by Kamoya, her father, in August of 1984, so this would be 40 years since that find was made. She has been developing this book with a Kenyan illustrator from Lake Turkana.

MAGGIE LEMERE: So beautiful. And I imagine you must imagine how just delighted your dad's or your parents would be to know that you two are collaborating in this way and carrying the work forward together. And on this point of public education, I'm just curious, you were talking about for the Kenyan kids to know that this heritage is so close to them and the questions they might ask, but are there things that are kind of important for you that you want more kids and more people in general to understand about human origins? What are some of the key messages that you maybe wish the public was exploring or had more access to? I think it's a particularly sometimes controversial topic in the US still to this day, and from your perspective as a scientist, how would you think about that?

LOUISE LEAKEY: Yeah, it is obviously controversial in that science isn't universally taught, and if it is, the field of human evolution is very rarely covered. So it's an important topic and especially I think in today's context of the fact that we now have the evidence that shows that this story of our past really begins on the African continent. And I think that's something that children in Africa should be aware of and very proud of, in a sense, that this all happens there. And I don't think the rest of the world necessarily know that either. So that's one of the big things I think we've got to... It is the big take home, is that human species emerged in Africa and then spread around the world from there. We need to do better at sharing this message so that we have an impact in shaping their thinking.

MAGGIE LEMERE: I certainly wish more people knew that, because I think it's just so cool and so beautiful. And yeah, I guess at the time that your grandfather and others were working on their research, it was thought to be more Europe or Asia and it couldn't possibly be Africa. And so I guess in a way, all of the research you all are doing and all the discoveries are really helping piece together that story, which is an incredible story to keep finding out about. I'm not sure what my question is, I'm just kind of reflecting there. Although I guess there could be a question in it in the sense of your current

research. I know that you've also been looking some, or I believe you've been looking some at also *Homo sapiens*. I was wondering if you want to talk about the different pieces of the timeline that your research in the Turkana Basin addresses, and what's interesting and exciting right now for you?

LOUISE LEAKEY: Yes. I think we've been working a number of different sites. We've been working a site, South Turkwell, about 3.5 million years. And the reason we've been looking at that age is that you have several species from that time period. You've got *Australopithecus afarensis*, to which Lucy belongs. She was found in Hadar. This is the 50th year anniversary of that discovery by Don Johanson. She provided that our upright ancestors existed at this time period. *Afarensis* was thought to be ancestral to all later hominins in the fossil record for a while.

And so, when we were working the west side at Lomekwi in 1999, doing my PhD fieldwork and exploring sites on the west side of the lake, Meaves team found an important skull. It was Justus Erus who made the discovery of the skull of *Kenyanthropus platyops*, it's not a pretty fossil. It was preserved in a clay, and it had cracked and expanded and contracted before it was fossilized. But it clearly represents a species that is not *afarensis*, and we have not found *afarensis* at sites in the Turkana Basin at that age.

So this fossil and isolated teeth found that year represented a second species from 3.5 million years ago. This is the same area where the earliest stone tools have been recovered dated to 3.3 million years. These were found by Sonia Harmand and her team a few years ago. So you've now got evidence of several species from this time period. So, we've been working another site again at this age and we may have something else from this time period as well.

There is no reason why you wouldn't have multiple hominins at 3.5 million years, but it's not a very well represented age in terms of sites and those sites are not very fossil rich either. So, you've got to work really hard to find any hominin fossils that help us to fill out that piece of the fossil record.

So this is one time period that is of interest.

So whenever there's an opportunity to get into an area that hasn't been looked in for a significant amount of time, there's always a chance that you're going to add to the fossil record with new finds.

We're also trying to better understand where and when our own genus *Homo* emerges. Suddenly you have *Homo erectus* at 2 million years, but at that same time you've got *Homo rudolfensis* and *Homo habilis*. So where does the lineage *Homo* stem? So again, that pushes you back to exploring earlier find fossils that might be a likely ancestors to these later hominins at 2 million years. We now have a much better understanding of hominin diversity from these earlier times.

We've also got to try and fill in the gaps from that later time period as well. What is called *Homo habilis* and is sexual dimorphism playing a role. Perhaps some of the teeth and mandibles that we've thought are one thing may actually be females. Frustratingly the evidence is still so fragmentary, and we don't have wonderful complete skeletons to work with. If I were to wish for anything and make it happen, I would like a complete skeleton of every hominin species that we know of to date so we could finally tease apart to which species the many different little fragmentary specimens we have actually belong to. So we continue to try to add more to the collection of fossils that ultimately will help us understand the hominin fossil record better. This is why we're still going back to sites on the east and west side of Turkana that are from the 3 million year to 1 million year time period.

And then of course, there are paleoanthropologists looking at deposits of ages that are 300,000 to 200,000 years, which is when our own species *Homo sapiens* emerges. There are also sites in the Turkana Basin from this time period, being explored by a team from Cambridge University led by Marta Lahr. They have found some really interesting fossils from sites, particularly on the west side of Lake Turkana that I think are going to really shed light on that story in the coming years as well. So there's a

lot more work to be done. It is not easy to go and find these fossils. It's really time-consuming. It takes a lot of effort and teamwork to actually find hominins.

MAGGIE LEMERE: No worries.

LOUISE LEAKEY: Yeah. So there's a lot more work to be done. I don't think I'm going to be the one to find all these answers, that's why I've got to make sure that we invest in the next generation. So a lot of what we're doing now is training, and mentorship, and making sure that we've got East Africans that are going on to get masters and PhDs, who can come back and lead these programs both through the National Museum and through the Turkana Basin Institute. They will need access to funding to lead these expeditions and to keep finding the fossils to help us to understand this landscape a bit better.

MAGGIE LEMERE: Yeah, it's exactly what I was thinking about. It's just that this is the work of more than a lifetime that we're, or you and your colleagues, you're all contributing pieces to something that's so much bigger than yourselves. And I guess I feel that with a lot of the scientists I interview, is this unfinished work that you pass on, but the lineages that you handed over to. And I just love how intentional you are about that and your work, and that your family was and has been as well. I can move us into some bigger picture kind of summative questions, but before I do that, I realized it might be helpful just to have you explain the basin and why it's so important for this giant research question around our African origins and kind of what makes it such a special place.

LOUISE LEAKEY: So the fossils are preserved where you've got high rates of sedimentation, because obviously if a bone's going to be fossilized, petrified, it needs to be buried by sediment either in a river, or a deltaic flood plain, or a Lakeshore setting. Here the bones are buried with sediment and the right conditions exist for mineral replacement and fossilization. So lake basins have formed up and down the entire length of the Rift Valley, in both the eastern and the western branch of the Rift Valley over millennia.

As water flows down from highlands into the valley bottom, water accumulating as lake basins which over time fill up sediments and provide the unique circumstances that are favorable for fossilization. These are rarely complete skeletons that are preserved in open landscapes, as a is usually dismembered and dispersed by scavengers, by hyenas and jackals, and vultures. It is very rare that whole skeletons are uniquely preserved in their entirety in these open landscapes.

So you've got unique circumstances where things are fossilized, because you've got these lake basins. You've also got excellent provenance, with the radiometric dating of the volcanic tephra, as a result of numerous volcanic eruptions along the length of the rift going back in time, because it was so volcanically active.

East Africa is unique, because you've got such a good record of dates ash horizons sort of interspersed with the fluvial and lacustrine horizons that are sometimes fossiliferous.

So it's a very unique area also because with the tectonic activity in the rift, the older deposits get pushed up to the surface and with time and natural erosion in dry, arid landscapes, fossils that were once buried deep underground are brought to the surface, and are exposed. With luck and careful prospection by our fossil hunters, we sometimes manage to find a fossil on the surface just as it is beginning to be eroded out of a hill side.

But the other thing to note about Turkana Basin is that it's a very large lake. It's 160 miles long. The fossil deposits extend inland either side of this extensive lake basin. It's would take years and years to find everything that's exposed on the surface. There is plenty out there that we'll never find, a lot of it's going to be lost for good as populations increase and land uses change.

So we have got to do as much as we can while we can do it. We also need to work with local government to make those counties aware of the heritage that they're responsible for in that region. And there's a real push to make that more widely understood at the county level administration and this is beginning to happen now.

So the Turkana Basin, I think it's very unique not only because of its size, but also because of the depth of time that's present there. In the very northwest of the Turkana Basin, there deposits that are late Cretaceous in age, 80 to 90 million years with some rare fossils of some later dinosaurs. They're not complete skeletons, some dinosaur remains do exist.

There are Oligocene sites with fauna including early primates and some teams are interested in working here now that it's easier to do fieldwork up at Lake Turkana with the support of the Turkana Basin Institute. There are also Miocene sites being worked on by several research projects investigating Miocene sites on the west and the east side of Turkana. A site called Buluk on the east side of the lake is producing beautiful new primate species. And the late Miocene sites of Lothagam is dated to between 8 million and 4 million years, which is the site that we were exploring the year my father had his plane crash. This is being worked by another research project today.

And to the very northwest of the basin there are deposits that go from 700000 through to the last couple hundred thousand years as well as an extensive record of the Holocene. Through to the last 6000 years.

So the Turkana Basin is unique in so much time is represented there, extensive well exposed deposits, because it's arid and it's not under thick vegetation. It's an unprecedented window into the past.

And that you still have this modern-day lake that's fed by the Omo River and continuing to preserve fossils or animals, although there's much wildlife to speak of any longer. But it is a great analogy to the ecosystems that existed there over the past. There is a detailed paleoenvironmental record through the stratigraphy and the fossil fauna, the ostracods and the isotopes to explore how that environment changed over time and how that corresponded to big shifts in global climate

MAGGIE LEMERE: Absolutely amazing. And I appreciate your comments around how you can't take access to this place or other places for granted with just kind of the rate of exponential development and change. And it makes me think about, again, the role of you as a public ambassador for this work, where in a way you're also an advocate for this site continuing to be a resource. I wanted to turn here into just some big picture reflections. You were born into this, but you had a choice and you chose it, and you caught the bug, I guess you could say, and you've made it your life's work. And I always think about human origin scholars as just sort of being very special people, because you're thinking about what it means to be human day to day, whereas a lot of the rest of us are human, but we're not thinking about it with this kind of timescale and perspective of the fact that there were even other species of hominids or humans. So I was curious for you, Louise, how maybe both being born into a family that was thinking about it, but also then choosing to think about it yourself and make it your work, how it's affected your perspective maybe on time or of our species and our trajectory, whatever you feel comfortable sharing.

LOUISE LEAKEY: It's always an interesting one. You think about an area like Turkana, and from the fossils that we find there, you know that these species once existed in abundance. Today many of these have gone extinct. And in a matter of decades an area that was once teeming with wildlife has none left over the space of a lifetime. In the late 1800s, there were many elephants up in the Omo delta that feeds into Lake Turkana- all gone now. You are lucky if you even see a dik-dik now. It's gone because more and more people have begun to occupy that same landscape. This mirrors what's happening to nature in the rest of the world, where human population has grown enormously in a short period of time.

When my grandparents were working at Olduvai in 1935 there were, what, two and a half billion people on the planet, and today we number over 8 billion people, and now there are more people in India than there are in China, which has a quarter of the world's population. Africa is going to become the next big number, in terms of people on the planet. How will this human population impact nature, and all the species that we share this planet with? I think people need to stop and think about this. We can observe species extinctions in the fossil record, we know how quickly that can happen. It makes you stop and think that as a species, we're not that secure, in terms of our long-term existence. I often wonder, if we could come back a hundred or so years from now, what planet earth is going to look like. I don't know the answer but I wonder if as a species, we may have done ourselves in.

We do have a responsibility, every single one of us, in terms of trying to do our bit to make sure that our footprint is as minimal as possible. We need to think about the impact of a cup of coffee or how much water was used to get that to the table? What about the cell phones that we keep upgrading every few years? What's happened to the bird and plant species that would have existed in that same area where they've been mining for metals that form components of the cell phone? What about the deep ocean? It is terrifying, what's going to happen in terms of the ocean mining and even less checks and balances because we can't monitor it so easily. Yet our survival as a species is dependent on all that we coexist with. I feel worried and concerned.

But our little contributions and care for the planet actually do go a long way when done collectively.

Working in this field does actually make you stop and look at the bigger picture and worry a little bit more about where we might be headed as a species. I always say that it's our technology that's enabled us to survive as *Homo sapiens*, because we very nearly went extinct. That we survived that was because we were able to adapt. It was because we clearly had some technology at our disposal to enable us to access food resources.

Then look where we are, in terms of numbers today, and we're going to be dependent again on technology. That, as a species, is where we have a huge advantage. But if we were smart, we would do so very carefully in terms of co-existing with all these other species that we share the planet with because once they're gone, they're gone, and we're not going to be able to bring them back. We are driving such incredible change now, across the world what is our future as a species on the planet. We know what we need to do to survive for the long term, but we aren't very good at actually doing it

MAGGIE LEMERE: I couldn't agree more. Actually, the question I'd written down, which you just spoke to so beautifully, was, what is our place in nature in an evolving world with so much other life? It almost feels like as *Homo sapiens*, we forget that we're actually connected to this whole network of other life. The technology can be incredible, but can also be a pitfall if it actually takes us away from knowing place. I imagine it's in connecting to place and appreciating place in that deeper sense, and I imagine all of the research and the studies show environmental change and it shows species that come and go. I really appreciate your perspective that it pushes you to think about these things more. I wish we all would think more about the implications of being human as connected to the rest of life.

I'm also curious what it's felt like to become part of this scholarly, scientific, human-origins community. Before I started this project, I didn't really, to be honest, think about human origins as a field. I thought about the study of human evolution, but I've come to realize there's so many different ways that people approach it. There's so many different types of studies, and it's very interdisciplinary. Any reflections on what it's been like, on any colleagues that have been important to you or partnerships, or what you're excited for for the future? As being now, you're holding the mantle and working to pass to the next generation, but you're very much in it.

LOUISE LEAKEY: Yeah, I feel very fortunate to be able to collaborate with so many different scientists and experts and who... And every collaboration opens opportunities for me to learn so much about their specialties, their disciplines. We are very much on the ground finding the fossils with the teams, which is a true honor. It's tremendously exciting, and it's very hard for a lot of people to do the fieldwork and to actually find the new fossils. Once we have them, we then collaborate with additional scientist to study the fossils. Where I'm not an expert, I am fortunate to collaborate with people who are. From every fossil that we work on collaboratively, I learn so much from the scientists that we work with. I'm very fortunate to be part of this community.

We learn so much from every find that is made and published because you're building on existing knowledge, and sheds new light on what we thought we knew. It is an exciting community to be a part of, and I think whereas in the past, people were very guarded about what they had found and didn't want to share data, I think that landscapes changed in recent years. I think with more people working these fossils there's a lot more collaboration between scientists in different parts of the world.

I would love to find an opportunity to gather the larger community with casts of things that have been found in different parts of the world and sit and discuss off record what we have, and how these different fossils have influenced and shaped our thinking over time. There still are some people who are very set in their opinions but the fact that there's so many more people involved and more finds that have been made that really have thrown up some huge surprises in recent years.

Can you imagine how exciting it would be for my grandfather, who died in 1972, the year I was born, to come back and see all that has happened since the discovery of *Zinjanthropus* at Olduvai in 1959. They had only a small handful of fossils at that time. Clearly, Africa was the place to look for fossils to help us understand that story, Marys find had obviously put Africa on the map and he was excited about what was to come. If he could step back into this world today and see how much has actually happened in the past 60, 70 years, I think he would be hugely impressed at how many people have contributed to that story that he set in motion with my grandmother, Mary. With the discovery of OH5, field work took off in this part of the world.

Had that find not been made, I think it would've been a different landscape today. There have been so many people involved since then, a really interesting and diverse community of people who've contributed to that story. Hopefully, there'll be many more people who can explore new sites looking further west, say, in different parts of the African continent that, no doubt, will throw out some more curveballs and make us really think about what we know already.

MAGGIE LEMERE: Absolutely. It's both exciting and daunting to think, "This thing that I thought might actually be totally wrong because now there's this new thing," but it seems humility actually might be important to being a scientist, as well as teamwork, which you brought up in the earlier part of our conversation. Sometimes, at least in western media, the scientist is the guy in the white jacket who's a singular genius. What I love about what you've described is how important it is to work on these

dynamic teams and how everyone has a different experience or expertise or perspective that they can bring to these really, really huge questions. I feel if we were able to communicate science as team-based and problem solving and sometimes logistics, that there are more roles and more spaces for people to be involved.

Just a reflection from me. Another big reflection question for you, Louise, what do you feel particularly proud to have built and contributed or to be building and contributing? Because I know you're not done yet, and even more broadly, when you think about some of these big questions at the field of human origins is exploring what your family's work in East Africa. You were just answering this, but I'll ask it a little more explicitly. What part of the story or what part of the building of the team do you feel proud about?

LOUISE LEAKEY: They're multiple layers. Obviously, I think my involvement in establishing what's on the ground at the Turkana Basin Institute that's in the north of Kenya, in terms of training the staff and making sure that the systems on the ground there are established and working. Also in the contributions of our field team to the huge numbers of fossils that have been collected over the years. It's been really rewarding in terms of training and getting new teams working on fossils, but also making sure that the collections that are held within the National Museum, and also at Lake Turkana, are properly safeguarded. I think the collection storage is in desperate need of upgrading, and we are trying to raise support for upgrading the storage and digitizing records because the government is not going to fund that.

If we're not careful, we stand to lose important information. It's a slow burning fire, so we, as a community who have enjoyed coming in and working on collections, have got to actually make sure that we work together to give back to that institution to make sure that collections that are held there are safe in perpetuity for the world. I think a lot of what we've got to focus on is to make sure that it's there for the long term.

One of the things I'd really like to see restored is the national park, where much of this work happened in the '70s and '80s, which used to be teeming with wildlife. Sibiloi National Park, today has got very little wildlife left, and it's still home to some very important fossil areas. Koobi Fora, where old research camp was in the early days, is completely run down, underwater and dilapidated.

We could raise some funding to restore that national park, reintroduce wildlife, train community game scouts and ensure the park becomes a benefit to that region and that the fossil areas held within it at be kept safe going forward. The national park would provide a place for people to explore where this extraordinary story of our past unfolded.

There are many different things, but I think we've all contributed in so many ways. I think the big effort is to make sure that we tell these stories and that we get the next generation of youngsters and Kenyans, East Africans, excited about that past. I'm hugely excited about what Jennifer and I are working on now, which is the stories that we can get into classrooms. I think that that holds great promise and is something that's really worthwhile, and that's what we're doing through Leakey Journeys and Expeditions. A journey is a lecture, it's a story, it's a journey into the past, it's exploration, and then the expeditions are the teams that are still out there, looking for the fossils on the ground, day to day. That's the umbrella that we're trying to drive this forward using at the moment.

MAGGIE LEMERE: It's such a dynamic and vibrant ecosystem, and I love the vision of bringing the wildlife back and thinking about this region long term, and even, as a human, experiencing landscape the way it was not even that long ago. But also, it's always incredible to think about modern human ancestors or

other types of hominids who lived on the planet with so much biodiversity and animals, and it's incredible. I love that thought because I think it's something that, unfortunately, a lot of people don't have much access to these days, as part of your work. Louise, how do you want to feel? What are your goals for yourself moving forward? What do you want to be doing, and what are you hoping for yourself for the next chapter?

LOUISE LEAKEY: We want to be exploring the past and inspiring the future. I think that really sums it up. And so we need to make sure we continue with finding things, but in so doing, we get people excited about it, so that we then get people thinking about where we're headed, as a species, and getting them excited in getting involved in the work and protecting the planet and trying to give meaning to what we do. Because in some ways, it's hard to justify working on old bones when there's so many pressing issues in the world today. We need to use that to generate momentum, to generate an interest in understanding our place in the planet and what we're doing. We've got to reach people that are going to be inspired to make a difference going forward. I think that encapsulates that.

MAGGIE LEMERE: I appreciate your awareness of that and also your stated commitment to the planet. Having interviewed a lot of Smithsonian scientists, certainly the older guard, was much more... You said you didn't want to just be this academic with your nose in a book and just writing and publishing only. It's pretty incredible the way you've also, similar to other generations of your family, been carrying out this way of bringing these stories and this inspiration to so many people. I've seen it in person, the way you're able to do it, and I think you are making it more than old bones. You're doing a good job. Is there anything that you wanted to add, Louise, about your research or your work or any of the stuff that I might not have asked you that might have been on your mind?

LOUISE LEAKEY: No, I think we've covered a lot. It's really important that we raise awareness to make sure that people can help to protect the story of the past, preserve it somehow, because unfortunately, there are so many other priorities in a country, or a continent like Africa, where you've got this growing population and there's so many pressing issues like education, roads. Protected areas aren't very high on the list. Fossils are even lower down the list. Yet, we really need to safeguard this for humanity because it's a story that belongs to every single one of us, and unless we all play a role in making that happen, we're going to lose it.

That's where this field can be unifying, as long as we can make sure that people feel it is relevant and can support it in some way. The only way to do that is to have a little bit more of an understanding of that story, so that's where it comes in, and that it is something worth protecting and supporting for future generations. That's the message you've got to get out there.

MAGGIE LEMERE: Beautifully stated and stated in the time when the world feels particularly fragile and on the brink, so really appreciate your perspective. Louise, thank you so much. I know this has been a long interview. I will go ahead and turn off the recording, but wanted to thank you for your generosity.

LOUISE LEAKEY: Thank you so much, Maggie. It's been really good chatting.