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Our species of human beings, homo sapiens,
is today the only kind of human on the planet.
But we know that wasn't always the case.
For a very long while, modern humans co-existed with Neanderthals.
And we know there was another species of human,
a tiny human with large feet, homo fluoresiensis,
nicknamed the Hobbit, that was found in Indonesia a while back.
And now we know there was another enigmatic kind of human
called the Denisovans.
We don't really know much about what they looked like
because only their finger bones and teeth have been found so far.
Dr. Kira Westerway is here today.
Dr. Kira Westerway is a geocrinologist and associate professor
at the School of Natural Sciences at Macquarie University.
Kira reconstructs and dates early human remains
and their tools at archaeological sites to find out how and when
they lived and died.
Just recently, Kira was part of the team that discovered
a major puzzle piece in the mystery of the Denisovans
in a remote cave in Laos, in Southeast Asia.
It was a single tooth, a 150,000-year-old tooth
that had belonged to a Denisovan, and that was weird.
Because the other fossilized remains of Denisovans
have been found far, far away in much colder habitats
in Siberia and Tibet.
Kira is at the forefront of the investigation
into these mysterious people and how they migrated across the planet
and into bread with modern humans far out.
Hello, Kira.
Hello, Richard.
Who were the Denisovans?
What can you tell me about them as people?
Well, we know them as a human group.
We know more about their DNA
than we actually know what they look like,
which is probably the only species of human
that we do know more about their DNA, which is incredible.
And the reason we know more is because
ancient DNA is really well preserved in really cold environments.
So we've got the caves in Russia, Denisovan cave,
and we've got the Tibetan Plateau.
And because it's so cold there,
the ancient DNA is really well preserved.

So although we only found a tiny finger bone
of this human group, we were able to reconstruct their DNA.
So we've been able to have a look at where they sort of disperse
when they migrated based on their DNA,
which is really interesting.
Do we know if they were tall or short,
whether they had big heads, small heads, large feet?
Can we tell anything about them at this stage?
Not so much.
We only have their teeth, obviously, and finger bone
and other sort of diagnostic points,
sort of bones that we can't really tell much from.
But yeah, so we know that they were potentially similar
to modern humans and Neanderthals,
but again, we don't really know.
All we know is their DNA.
We can reconstruct their path,
like where they dispersed across, down through Southeast Asia,
down into Australasia and Australia.
So the Denisovan, and presumably there was more than one Denisovan
living in that part of the world in Southeast Asia and Laos.
Do we know if they were the first humans or humanoids?
And what do we call them anyway?
Do we call them humanoids, humanids, human humans?
We can call them humans. We can call them hominin.
We call them a hominin group,
because some people have always asked me,
like, is it different species?
And the thing is the definition of a species is that
you've got two groups that they can't produce a viable offspring.
That would define them as species,
but we know that modern humans and Denisovans
and Denisovans and Neanderthals could produce a viable offspring,
but they do have very different evolutionary paths.
So they're kind of at that point now where we don't really call them
a different species because they haven't been separated
for long enough to actually be that different.
So were the Denisovans in Laos?
Were they there before homo sapiens,
before modern humans walked over from Africa?
Well, so they were there.
We know from the dating of this tooth
that they were there about 160,000 to 130,000 years ago.
So that's definitely long before modern humans were there.

But what's really interesting about the timing
is that they were in Laos at the same time
that they were actually in Russia and on the Tibetan plateau.
Yeah, now that's weird.
Is that weird or am I just thinking that's weird?
No, I mean, I think it's incredible.
I mean, if they were there at a younger time than in Russia,
then we could say, oh, they were in Russia
and then they migrated down into Laos.
But because they were there at the same time,
we don't really know which was their first.
So it doesn't really tell us about where they came from,
but it tells us they were there at the same time,
which is incredible.
So at what point, when these first remains were found,
did we realise that we had a whole different kind of human
on our hands here?
Yeah, I think it was finding the finger bone,
potentially knowing that it was a human finger bone,
but not knowing what human bone.
But obviously, because of the cold conditions,
the first thing they try is the ancient DNA.
And then suddenly we're getting this whole story
of a group of humans that we didn't know anything about.
And that's crazy.
And then looking at the ancient DNA,
we see that modern Australians have a small potential
and about 4% of Denisovan DNA in their DNA.
So they have actually contributed
to who we are as humans today, which is incredible.
And when you say they were able to extract DNA
from this bone fragment from Russia,
from this cave in Siberia,
what is that DNA?
Was there a tiny bit of flesh lift in there,
or bone marrow or something,
or just inside the bone somehow?
Yeah, so it's just within the structure of the bone.
And they're looking for collagen
and anything that was originally alive.
Right.
And so they just put that under,
they did a DNA test in there and went, hello, there's some...
Yeah, so they have to reconstruct

the whole sequence of the DNA.
So they have these big DNA sequencing machines.
It takes a long time to actually sequence the whole thing.
But we obviously know human DNA
and we can see that it was human,
but it also has these other links in it
that make it slightly separate from that.
Why is it hard to find Denisovan remains?
Given that you've found a bit of a finger in a tooth,
I think, somewhere as well.
Is it possible you could have...
Is it possible you could have Denisovan bones
just in your drawer at Macquarie Uni,
rattling around somewhere that might be Denisovan?
You haven't been able to identify them?
Yeah, I think there's an interesting thing.
Once they had reconstructed the DNA,
then suddenly the hunt was on.
There's always been some fossils
that don't really sit very well in one grouping or another.
And people just put them in that ancient humans group
because we don't really know where they sit.
And so now I think this is...
Everyone's gone back and had to think about those bones
that we put in the too hard basket.
And reassessing.
I know there's a lot of bones in China at the moment
that are being reconsidered as potentially as Denisovan.
And then when we found this tooth,
I mean, we couldn't do the DNAs
because it's hot and wet is the worst conditions
for DNA reconstruction.
We had a look at the proteins, the paleo proteins.
And that told us that it was female
and it told us the age,
probably between about 3 1⁄2 and 8 1⁄2 years old.
So only a juvenile, only a small child.
Well, before we get to that,
just tell me how you knew to go looking in it.
I mean, given that the previous fossilized remains
have been found so far away in Siberia and in Tibet.
What made you think, hello,
I'm off to Laos to go and look into the cave there
for Denisovan remains.

I mean, we were already there to be fair.
I've been working in Laos since about 2011.
And I've been working with a French-American team.
And we had excavated a site called Tampoling
where they had found modern humans,
originally about 46,000.
And then every year they've been finding more.
So it's gone to about 70,000 there.
So that cave there was known as a modern human site.
And what we do whenever we're at any site,
we start doing reconnaissance little trips.
So we go out and we have a look at caves
and we come back and then go out again
and did a little scouting trips.
We asked locals about where they've seen caves,
where they've seen fossils, you know,
because a lot of the locals are quite aware of these caves.
So sorry to do that.
Do you have to kind of think like at this ancient human?
Do you have to sort of walk around these spots and go,
this would be a nice spot for shelter and to light a fire?
Yeah. I mean, there is definitely that.
If you're looking for occupation caves,
you definitely think about would an ancient human
be able to live here?
Is it an inviting place?
We know that they don't go to the back of caves.
They usually sit, what we call the drip line.
They're just in the entrance of the cave.
So they like rock shelters more than they like deep caves.
But there's also the type of cave
which is just a sediment trap.
So all it's doing is channeling sediments
and fossils from the landscape
and then they're like sort of
sliding into.
So every time you have like slope wash from the hillside,
they're all sliding down into
and being deposited in these caves.
So they're definitely not occupation caves.
You won't find hearths or stone tools necessarily,
but you do find fossils
and those kind of caves are the ones
that really find their interesting stuff.

Slope wash is a new word for me.
Slope wash.
I like slope wash.
So these caves sort of become like little catchment areas.
Yeah, literally a trap for sediments.
Over like hundreds of, maybe 100,000 years
I'm going to take to wash into these places.
So you were just hunting around looking to see,
it was a bit of a looksie.
Yeah, total reconnaissance.
We knew about the cave up there.
It was quite difficult.
It was about 30 meters off the livable plain.
So it's quite hard to get up to.
It was a bit of a climb,
but once they got up there,
they just started poking around.
Clemont Denoulli, he's one of the French team.
He's a paleoanthropologist.
He found the tooth.
He said, this is human.
And where was the tooth?
How was it found?
Literally just in the side of the sediment wall.
So they were poking around.
It's lodged in a wall.
Yeah, so basically it's what we call a bone brachia,
which is accumulation of quite angular rocks
and lots of fossils as well.
And they're literally in a sediment wall.
So assuming that you say that you were able to establish
that this tooth belonged to a young girl,
a young Denisovan girl.
She died for whatever reason.
And her body lay there for a while.
And then over time, what the sediment came in
and just pulled apart bits of a skeleton or something.
And that's how it ended in a wall.
The tooth ends in a wall.
Yeah, so remember the landscape would have been higher.
It would have been at the level of the cave.
The cave would have probably been lower.
So her body would have degraded down into fossils.
It probably would have moved around the landscape a little bit.

Obviously why it's all broken up.
And then at some point it would have washed into the cave
and then formed in this deposit.
And that's just perfect for us
because you've got the fossils
and you've got datable material.
So it's just a perfect scenario.
Is there anything else belonging to just the tooth so far?
No, just the tooth so far.
It was surrounded by lots of herbivore fauna.
So there was lots of animals around
that they could have potentially been hunting.
We obviously know that there would have been more
because it was a juvenile on her own
like she wouldn't have been living on her own.
Do you know what I mean?
I'm sure that mum and dad would have been a community.
Or someone around.
So this was a molar, wasn't it?
A molar of this tooth.
How much can a tooth tell you about a human being?
An incredible amount.
Teeth are like an archive of information about yourself.
I mean, I work with Renault Jean-Asboia
from Southern Cross Uni.
And the amount of information he can get from teeth is incredible.
You know, they slice them open.
They have a look and it can tell things like
how long you were breastfeeding for.
Really?
Yeah, you can tell you about mobility in the landscape.
So how you were moving around in the landscape
where you were going.
What do you mean?
Like in terms of what you work by diet, you mean?
Yeah, so they look at diets.
They look at oxygen isotopes,
oxygen and carbon isotopes,
but they also look at trace elements.
And they're looking at things like strontium.
And they can get a strontium map of the area
to work out the strontium levels
and then work out where they were walking around
based on the strontium in their teeth.

So there's like a universe of information inside a plate.
Yeah, I call them the teeth whisperers,
you know, because they seem to be able
to get so much information from teeth.
And teeth are obviously the most preserved
of all the fossils.
I mean, you're lucky if you find bone.
Mostly, especially in Southeast Asia,
it's just dominated by teeth,
but luckily teeth are fantastic.
You can date them and you can get information from them.
It's incredible.
So what does it mean to have found a tooth
in Southeast Asia?
Well, the fossil of such a human in Southeast Asia
and in these kind of colder,
more mountainous places or colder places,
I should just say, in Siberia and in Tibet.
What does that tell you about the adaptability
of the Denisovans?
Yeah, pretty incredible.
We always associate being really adaptable
from modern humans, from modern homo sapiens,
because they were very good at adapting
to diverse environments.
But this tooth really made me understand
that if they're adapting to the freezing cold of Russia,
plus the high altitude of Tibetan plateau,
that's an adaption to be able to live
in a high altitude area,
plus the kind of barmy hot caves of Lao,
all at the same time.
Now, that's incredible.
That's on the same level as modern humans
as being able to adapt.
But remember, this is 100,000 years earlier
than modern humans were in these areas.
So they were actually adapting to these diverse environments
100,000 years earlier than modern humans,
than we were doing it, which is incredible.
And yet, as you say,
there are elements of Denisovan DNA in some modern humans.
Yeah.
That means, I'm afraid to say, Kira,

there was some kissing and cuddling going on at some point,
doesn't there?
There was some interaction, definitely.
So what do we know about that?
So, I mean, not the gory details,
but is it, so humans walked over from Africa,
modern humans walked over from Africa,
walked across Eurasia and arrived,
got into boats or arrived in this,
not in a boat in this case,
but arrived in this part of the world.
Yeah.
And there was, there was either war
or sex that always tends to be the two things, doesn't it?
It's the natica erotic, the two, the encounter there.
So do we know when that would have taken place?
It's hard to say.
I think the reason that we were so keen on looking in Southeast Asia,
and this is why a lot of paleoanthropologists
are looking in Southeast Asia,
is because there was what we call an introgression,
which would have been an intermixing of Denisovans
with modern humans at some, at certain points.
And there was definitely one in Southeast Asia.
There would have been one in Australasia,
maybe Papua New Guinea, places like that.
So people have kind of pinpointed that from the DNA structure
as to when these introgressions were,
and then that's kind of honing everyone in on where to look.
Do you know what I mean?
Is Southeast Asia such a place because it's so lush
and so abundant in food, I wonder,
as opposed to some sort of bleak tundra?
Yeah, I mean, I definitely think that there's that to it.
But I also think it's because of the expanse of limestone.
Because we have limestone caves,
then we get these incredible sediment traps
and they are preserving all this material.
Without the limestone, we wouldn't get the caves,
and then we wouldn't get this preservation.
So obviously, you've got the occupation side
where they were caved to them to live in,
but also this sediment trap side,
which is just containing all the fossils for us,

which is fantastic.
You're not an archaeologist.
You are a geochronologist.
That's correct, yeah.
Big word.
What is a geochronologist?
So it's just really about time.
I'm a time lord.
I try to reconstruct when events happened.
And the dating technique I use is luminescence dating.
It's actually optically stimulated luminescence.
What is that?
What is luminescence?
What is glowing here?
Yeah, exactly.
Well, the actual signal is glowing.
So it's a light-sensitive signal that is sort of reset by sunlight.
So we're looking at minerals such as quartz and felspar.
So unlike carbon-14, which is organic dating,
like dating something that was alive and then it decays,
this is inorganic.
So quartz and felspar, well, obviously never alive.
They're just minerals.
But because they have this crystalline structure,
they can retain a signal when they are buried.
When you expose them to sunlight, they reset to zero.
But then when you bury them, they start to build up with this signal.
Far out.
I know, it's crazy.
That's amazing.
And where are you extracting these tiny,
I'm assuming these are tiny bits of quartz and what have you,
like what, immediately around or in the bone fragment or something?
We'll take a sediment sample.
Obviously, we have to be very careful to take it in without light exposure.
So we either bang tubes in or we do it,
like because I work in caves, I just do it in the dark.
So we use to do it in the cave going, don't point a torch.
Yeah, no, there's absolutely no torches.
People go, can I take a photo?
And I'm like, no.
No.
Yeah, so it's all about light.
I'm very paranoid about light.

So you're going to go in in the dark and extract the tiny,
what are tiny salt samples then?
Yeah, so because I work in caves, it's quite easy just to make it.
And I just go, okay, we go red light.
So I have a little red light head torch, which is safe for the signal.
And then I'll take a sample and then we'll take it back to the lab.
And then obviously I have a very dark lab, a red light lab.
And then I process the quartz and feldsparin or feldsparin,
get it down to a mineral and then I can actually,
I fire a laser at the actual, the sample and that gives it energy
so that the signal actually comes out.
And the amount of light that comes out is proportional to how long
it's been building up that signal.
That's amazing.
Like the tiny little, tiny little bits of quartz and feldspar can be,
can be emitting a signal, I suppose.
It's a signal, isn't it?
Yeah, it's a signal and it comes out as light, which is, which is crazy.
Very, very dim light, but we have photo multipliers,
which are able to measure a very, very dim light.
And that's basically how the process happens.
And what's incredible is that any sediments that you find anywhere in the world
will have either quartz or feldsparin in them.
Some will have just quartz, some will have just feldspar,
but you'll have one or the other.
So that means anywhere that there's sediment buried, I can date it.
And it's not just the sediment I'm dating.
I'm dating the fossils and the stone tools and any other artifacts
that's inside the sediment at the same time.
How precise is it?
That's the golden question, isn't it?
We can, we do have a lot of uncertainties in luminescence
because there are lots of elements to it,
but we can get, you know, five or 10% error margin,
which is, which is not too bad.
And luminescence can go down to about a hundred years
so I can date something that's only a hundred years and up to, I mean,
you know, depending on the conditions, we can get up to like 800,000
and a million years old sometimes.
So you can get it down to the nearest 100,000 years
or the nearest 10,000 years or something like that.
Oh, yeah, yeah, no, we can, we can, we can, with an error of only 5%,
you know, it's, it's not that, not that bad, not that large an error gap.
So, yeah.

I'm gathering you probably thought you always wanted to be a scientist, Kira,
but I don't suppose everyone wakes up going, I want to be a geocrinologist.
No, exactly.
How do you, how does someone like you end up in a line of work like this?
I actually, when I was younger, I actually wanted to be a teacher
and my mum used to tell me that I used to line my dolls up
and teach them classes and stuff like that.
And then I got to uni and I was like, yeah, no, I want to, I want to go into science.
I want to be a lecturer.
That's what I want to do.
I was originally really into process and landforms.
So physical geography used to be called, then it's more like Earth
and environmental sciences now.
I really like, you know, just looking at a landscape
and kind of working out how it's been formed
and that the processes that were involved in creating landforms.
So has this come from a love of fascination with deep time?
Yeah, definitely, definitely time.
But I think of that time when I was really into that,
I wasn't so aware of the time element.
I was more into just the process.
And it wasn't until I did a masters in London
that I was introduced to luminescence dating.
And I was just amazed because it's like, not only do you know what process happened,
you know when it happened, you know, somebody, a very wise colleague said to me,
we kind of know what happened.
We just don't know when it happened.
And when became this, this amazing tool,
especially luminescence dating became this amazing tool
in which I could not only work out how things happened, but when they happened.
And the whole time it became this huge thing
because, you know, you give things context by saying when they happened, you know.
So a stone tool could be just a stone tool,
but then you date the sediment around it.
It could be the first time that stone tools ever been made on that continent.
This gets really interesting in Australia too, because you get further and further back.
We've been having on this long journey discovering how long Aboriginal people have been in this country every time.
And so the wind becomes really important then.
The time is just this element.
I mean, we as humans are quite obsessed with time.
We want to always know when things happen.
And suddenly you have this tool where you can tell exactly when things happen.
It's almost like a time machine.

You go back a hundred thousand years to a precise moment in time
when that fossil was deposited in a cave.
And that's an incredible thing to be able to use in science.
So was it straight from there to the caves of Lao?
Or did you make a couple of pit stops in the way?
Couple of pit stops.
I did a masters in Hong Kong in luminescence dating as well
and obviously got the travel bug a little bit when I was living in Hong Kong.
I was there for the handover to the Chinese, which was incredible.
And after that, I was just like, yeah, I just kind of want to travel a little bit.
So I was a dive master at the time, so I was really into diving.
And then I went to Thailand and ended up being an instructor
and running our own scuba diving shop for about four years in Thailand,
which was incredible.
Yeah, sounds glorious.
What got you out of the scuba dive shop and back to science?
Yeah, so I kind of had a deal with myself that, yeah, it's all fun to, you know,
be traveler and do all that fun stuff.
But I wanted to do a PhD by the time I was about 30.
So I sort of put the feelers out to do a PhD.
But Professor Richard Roberts from University of Wollongong contacted me.
He actually phoned me in England and my mom was like, oh, no, she lives in Thailand, you know.
So he sent me an email and he said, oh, look, we've got this great project.
Obviously not a famous cave at the time, Lian Boa.
And we'd love you to be involved in it.
And he said, just have a look to see what you think.
So I had a look at the website and it said, beautiful rainforest campus overlooked by Mount Kira.
And I just had, yeah, I had this moment.
I was like, I was like, I have to go and do it.
Like, I've never been so sure about anything in my life.
You know, and I talked to my mom and she said, OK, we'll just, you know,
sell up your dive shop and go to Australia.
And that's what I did.
And thank goodness, because obviously we all know what happened at Lian Boa.
Well, we're about to find out, aren't we?
So your first trip, field trip then was to this place called Lian Boa.
Yeah.
What was the mission?
What were you initially setting out to look for?
Yeah.
So Mike Morward and, but Roberts had been working a long time on flores
and they'd worked mostly in Sauer Basin, which is in the middle.
Now, Flores is this island.
Island in Indonesia.

To the west of Timor, isn't it?
That's right.
It's not far at all from Australia.
No, it's really not.
It's basically from Bali, which everyone knows Bali.
It's a couple of islands across and then you get to Flores.
But incredible island.
It's a really interesting mix of Christian and animist.
So they go to church on Sunday, but they still sacrifice animals, you know.
So it's like this really interesting mix.
And that's what I love about Indonesia.
You go to different islands, every island's got a different religion,
a different feeling about it.
But yeah, Flores was incredible.
Really amazing place to work.
And they knew about this cave because this priest called Verhoeven had worked there.
And then he'd done some preliminary excavations and found lots of Neolithic burials
and pottery and all that stuff.
So they knew it was an interesting cave and they'd estimated how deep it was.
So they knew it was had great potential.
But at that point, it was just, you know, go to the cave and do some dating
and see what happens, you know.
And what did you think you'd find there?
What were you hoping to find in that cave?
We were hoping to find modern humans.
Evidence of modern humans coming down through Southeast Asia,
through Indonesia, down to Australia.
That's what we were really looking for.
So you were trying to map human migration into the area?
Yeah, and we just thought it was a useful stepping stone on the way.
If you look at the islands, they look like they would be a nice stepping stone.
We've since found that because of this thing called the Indonesian through-flow,
it's actually very hard to go across that island chain.
But at the time, we thought floras would be, you know, a useful stepping stone on the way.
And tell me how the team made this amazing discovery there.
So we'd been there for three months and we'd excavated a number of caves,
a number of pits and we were down about three or four metres in this one sector.
I actually had a photo of me sitting there with Thomas Sutnika,
who's the director of the dig.
And I was just taking an luminescent sample and I was sitting on this big pile
of where they were about to excavate.
And then I left and went home to Australia.
And by the time I got back, I walked into Bert Roberts office and he said they found a skeleton.
And it was, Thomas told me to tell you, it was right where you were sitting.

And how big was the skeleton?
So it was, it was quite a, obviously it's a small skeleton because it's, you know,
a small hobbit we know now, but it was quite sort of all jumbled together.
So it wasn't over a huge area, do you know what I mean?
Right.
But when they, they thought it was a child because it was so tiny.
And as they, they took about three or four days to, you know,
harden the bones and make it so it could be moved.
And then as they were carrying it out, my friend who's a paleontologist,
he was looking at it and he could see that the, the mould is that, you know,
the wisdom teeth weren't erupted at the back.
So he knew it was, it was a whole different kind of human.
This is Conversations with Richard Feidler.
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or go to abc.net.au slash conversations.
When she was found, the skeleton, you said,
first they thought this is a human child.
How did, how did they, how did you and they know she was not a human child?
Yeah.
So obviously the, the, the skull was small.
The bones were small.
So they just thought, oh, it's a juvenile.
But as they, as I said, as they started to take it out,
they realized that the molars were erupted already.
So it wasn't, it was at least 30 years old.
All their teeth were down.
Yeah.
The teeth were all down.
They were all out.
So it wasn't a child.
And so they were like, what is this?
Do you know what I mean?
Like they're really, really confused.
And it took a long time for us to really sort of get our heads around
what it could actually be.
We, we know that it was human as in Homo,
but definitely not a modern human.
So we came up with a different name Homo,
Floresiensis for the Flores Island.
But yeah, when we came out with it, it just, as you know,
caused a lot of confusion.
When we came out with it, it just, as you know,
caused a massive uproar.
I think most of the science community were just stunned.

You know, like they, they didn't really know what to make of it.
So for a while there was a kind of a silence.
Do you know what I mean?
Obviously the media were going crazy over it and all that sort of stuff.
I read every story that was going around about it.
I know it was.
It was kind of human found.
Yeah.
It's kind of an exciting story.
So I was a new PhD student, obviously,
and we had to go down to the Australian Museum
to do the press conference.
And it was one of those things where, you know,
they have the, all the microphones around there.
I felt like, yeah, I felt like, yeah, it was,
it was, well, it was just felt like I was the president,
you know, when they talk on one of those podiums with all the,
you know, it was crazy.
So did you get to say, ladies and gentlemen,
we have found a new kind of human?
Yeah, we got a new human.
Yeah, it was, it was incredible.
I mean, as a PhD student, it was a bit crazy to tell you,
baptism with fire, really.
But then, but then after like, it had kind of sunk in,
then everyone, you know, the skeptics kind of came out.
Well, that's appropriate, isn't it?
I mean, that's science.
That's how science moves forward.
So what were the skeptics saying about this?
So the skeptics were saying it wasn't,
it was a modern human, but it just had some sort of disease.
And we sort of jokingly referred to it as disease of the week,
because every week there was something that it could have had
an iodine deficiency.
It could have had microcephaly, which is, you know,
a deformation of the head and everything.
But every week there was literally a different disease
that it could have had.
And we just stuck to our guns and said,
it's not a modern human.
It doesn't have any form of chin.
Now, obviously the chin is a structure that modern humans have,
an evolution that modern humans have.

And the Hobbit doesn't have a chin.
So we were always saying, look, if you can find me a disease
that gets rid of your chin, then we'll start talking.
But until then, you know, we just stuck to our guns.
Why was she nicknamed the Hobbit?
What was it about her that made her Hobbit like?
Yeah, it's very funny.
I was actually sitting with Mike and Bert
when this name came out.
And we were sitting there and we were like kind of,
we were thinking of sort of potential names
that it could be throwing around names.
And then Mike just sat there and he just sort of had this smirk
on his face and he said, what about the Hobbit?
And I was like, what?
He said, well, think about it.
It's small.
It's got big feet.
And we got it from a hole in a cave, you know?
And he said, that's just the Hobbit, isn't it?
Or Hobbit, rather than the Hobbit, he just called it Hobbit.
And he wanted to call it Homo Hobbititis
or something like that, you know, some sort of Hobbit name.
And we managed to pull him back from that.
Yeah.
And we were throwing around lots of different names.
But then the end, we thought Floresiensis was the best,
most appropriate name.
So when you say small, how small?
So the size of a three-year-old child.
Oh, that's small.
Yeah.
So it basically up to your hip bone was the size.
And it still freaks people out now.
Like I was thinking like a 10-year-old or something.
No, no, no, no.
No, three-year-old child.
So I had a small child at the time.
And I just, every time I saw him running around,
I was thinking, goodness me, a grown adult human.
Definitely about 30 years old was running around at that size.
And not just one.
There was a, you know, a whole community of them.
And what would state were her bones in when they were found?

Yeah.
So obviously any excavation, you're going to,
you're going to find some preservation issues.
But this, this was, had been obviously buried for a long time,
50,000 years or so.
And, and the excavators was telling me that it,
they felt like wet blotting paper.
They were so thin, they felt like they would just break.
If they got picked up.
So they had to get lots of hardeners and,
and things to paint on the bones so that they could withstand
being able to get pulled out of the excavation.
But they took about five days to get it out apparently.
What timeframe was your analysis able to place her in?
Like how long ago was she, was she living there?
Yeah.
So I had obviously, so in difficulty had taken that sample
right above where she was found.
So I already had a sample of, in the sediment.
So I came out with the technique that I did.
I came out with about 36,000.
And then we had dated.
That's not so long ago.
Is it really in those terms?
No.
So we had dated some charcoal with radiocarbon dating,
which is obviously dates something that was alive
and then decays.
And that came out about 18,000.
Now, when we told Mike Moore with these ages, he was just,
he didn't know.
He's like, I'm going to go and have a beer and think about it.
So he was just,
he just couldn't get his head around it.
Now, since then, obviously we've,
10 years later,
we've done 10 years of excavations at that cave.
And we got a much better understanding of the stratigraphy,
that the pattern of the sediment and the relationship with the fossils.
And we discovered that what we were actually dating was a younger
infill sediment that had actually deposited around these older bones.
So if you imagine,
there are kind of like a cliff of older material and the bones
were kind of eroding out of that.

And we had dated the sediments around it.
So then we did a redate and discovered that there's more like
about 50 to 60,000.
And we actually dated the bones as well this time,
which was, which helped.
Were there modern humans living on the island at the same time?
Yeah.
So we know that.
Good God.
Yeah.
Does it have a coexisting?
I know.
So we, for a while, we were confused because we had the hobbits up to 18,000.
We were confused a little bit about what was hobbit material
and what was modern human.
But since we got the correct age for the hobbit material,
about 50 to 60,000,
then we could see that there were actually evidence of modern human there
around a similar time.
So we know that they would have been around the island about 40,000 at least.
I mean, I obviously, in Sumatra,
I had found the modern human teeth about 73 to 63.
So we know they're around.
So they're in the same place at the same time.
Did they interact?
We don't know.
So you're working,
but you've got much more to work on here than you have with the Denisovans.
You've got more than a finger bone and a tooth.
Yeah.
Almost a complete skeleton, which is incredible.
Yeah.
And were there tools around nearby as well?
Yeah.
Her tools or tools of her people?
Yeah, definitely.
So we have what's called a living floor
where you have an excavation layer that just has stone tools
and bones and hearths.
And you could almost see people sitting in the cave and living there.
Some of the stone tools, the excavators, when they were digging,
they would dig and then one guy actually cut his hand on a stone tool.
It was still sharp 50,000 years later, which is incredible.
And what do we know about how they were living and hunting

the homo-fluorescence?
Yeah.
So we know that they were killing and dragging carcasses back to the cave.
Carcasses of what?
Carcasses of juvenile stagonon, which is a prehistoric elephant.
What?
And also Komodo dragon.
Yes, everything's small on this island,
apart from the Komodo dragon, which are very large.
So bonsai humans are taking bonsai elephants?
Yeah.
I know.
It's crazy, isn't it?
Did you just say Komodo dragons?
Yeah, Komodo dragons as well, which is incredible.
So definitely found bones of Komodo dragon, cut marks on the bones.
So they were definitely taken down Komodo dragons.
I mean, Komodo dragons are very fierce.
I went to Wrencher Island just to go and see Komodo dragons.
And yeah, they are incredible.
We were actually in the ranger station,
and this deer decided to run into the actual village.
And there was about, I just saw this flash behind it.
It was like a Komodo dragon moving so fast.
It was like a bullet.
I couldn't even see it.
And they got this deer, and there was about three, four big ones.
And they basically, over the space of about two hours,
proceeded to eat the entire deer.
And at the end, this massive Komodo dragon picked up the skull, threw it in the air,
caught it in its mouth, and just ate the whole thing.
Oh my God.
I was just sitting there going, oh my goodness.
It was incredible.
And they eat everything.
They eat the hide, the hair, the bone, everything.
They eat everything.
It's incredible.
And are you telling me that these people who were the size of three-year-old children
were hunting and killing Komodo dragons?
Yes.
Yeah, incredible, isn't it?
Maybe they had, maybe they built traps.
Maybe they built pits.

Maybe.
Were they, I mean, how big were their heads,
and how big were their brains?
So, Home of Residence has had a very small head
with a brain the size of no bigger than a chimpanzee.
So really tiny.
So were they, I know these are really subjective terms,
but were they as intelligent as chimpanzees
or more intelligent as us?
I would say more.
Obviously chimpanzees use stone tool,
actually not stone tool, sorry.
They use tools to help them do things,
but they don't necessarily make tools,
do you know what I mean?
And that's the definition.
And so Home of Residence has had adaptions
that helped them to sort of rise above,
I would say, the abilities of a chimpanzee.
And so we think they were quite intelligent then,
by not the same kind of capacity as modern humans
or not, I don't know.
I mean, it's hard to say, you know,
because we don't see them doing the same sort of skills.
They obviously had different skill sets that they use,
but I definitely think that this is one reason
why people really struggled with the discovery
is because it really turned on its head
what everything we believed about being human.
We believed that, you know, your brain gets bigger
and you become more intelligent.
And then suddenly there's a hobbit with this tiny little brain,
and yet displaying signs of being intelligent.
We also believed that we knew that hippos and elephants
could shrink down on islands,
so that when you...
They have this thing called island rule
where mammals will always reduce down
over an evolutionary time, obviously,
down to a smaller, more manageable size
to deal with the limited resources.
And we knew that animals did that.
We had no idea humans did that.
Yeah, you see, I would know how to take out a Komodo dragon.

I mean, my preferred hunting technique for Komodo dragons
is to fire a laser from space at them.
I think that's my...
And without that space laser, I'm not quite sure what I'd do.
So they had to be pretty smart to hunt and kill Komodo dragons.
Yeah, I mean, we don't have any evidence of that, obviously,
but the fact that there was Komodo dragon carcasses in the cave
and it looked pretty premeditated
as in, you know, that was part of their hunting strategy.
So, yeah, it's pretty incredible.
This is a really weird question to ask a scientist.
Did you feel any tenderness towards that skeleton?
I mean, this tiny human, humanoid creature
who lived and died all those years ago
and died where she fell, I assume,
and that's all that's left of her
and nothing of her people remains.
Is that something poignant in that?
Definitely.
I think it's incredible to, when you excavate these sites,
you spend, you know, three or four months there
and you get intimately involved with, you know,
the tools they were using and I used to sit
and just imagine them sitting in the cave
and obviously the entrance of the cave, not further back,
but just imagine them sitting there in communities
and I did a lot of reconstructing
of what the cave would have looked like at certain times
and I could always, you know, at one point
there would have been a little bit of waterfall at the cave,
there would have been definitely a big pool down the side
and when she died, she just slipped down into this pool
which was very, very fine material, like, silty
and literally it covered the entire skeleton
because usually in places like Flores,
you don't get skeletons because the Komodo dragons eat them.
So you think she might have drowned then?
No, I think she died and then the body
just slipped down into the pool
and that's why we think that she was so well preserved
because the body was covered instantly in the silty pool
and then obviously it wasn't eaten by Komodo
because any other fossil that dies on the landscape
will get eaten by Komodo dragon and then there's nothing left, you know?

Sounds like her life would have been pretty good
if it weren't for all the Komodo dragons
trampling around the place, but then...
I mean, life would have been in some ways,
aside from the Komodo dragons, quite ideally coming there
there's super abundance of food in the area, warm,
fresh water, rain, you know, all of those things.
Yeah, exactly, yeah, and we did a lot of looking at, you know,
when they were occupying the cave
and when they were sort of more on the landscape
and we discovered that when it was really raining a lot
they tend to occupy the cave, you think,
oh yeah, because it's raining, but it wasn't really that,
it was more because of the rainforest.
The rainforests are quite difficult to live in
and quite difficult to hunt in.
So when the rainforests were quite advanced
they were living in the cave, and then when it was much drier
and it would have been more open plains,
that's when they were coming out more
and not really living in the cave so much, so it's quite interesting.
So can we now assume then, on the basis of your dating
and other people's dating as well,
that there was a time when modern humans were walking the earth
at the same time as homophoresiensis, the hobbit,
and at the same time as Denisovans.
We were all wandering around on the planet at the same time.
And the homo-luzonensis that they found in Philippines as well.
That's another kind of human.
Another one, yeah.
So is it, I mean, how many different kinds of humans could there,
I mean, we don't know I suppose, but is it possible
there could have been like 20 or 100 different kinds of humans
walking around?
I don't know about 20 or 100, but definitely I don't think
this is the last chapter in understanding what was around,
I mean, Southeast Asia has been pitched as this hotbed
of human diversity and human evolution.
And the more we dig and the more evidence we're finding,
it's showing us that, you know, this is the area to dig.
This is the area to look for this incredible evidence.
Is it too simplistic to say this, but is it possible
to sort of construct a theory that says when homo sapiens,
us came out of Africa and wanted to cross, we pretty much

wanted into these areas and displaced all those people.
Like when we got there, they stopped being there after a while,
like Neanderthals.
Yeah, I think rather than like we would, I don't, you know,
it's not kind of a driving them out in any way.
I just think that modern humans were much better adapting
to specific niche environments.
So they were very good at hunting for marine life
around the coastal areas and they were very good at adapting
to rainforest conditions.
And I think that they just out competed any other sort of humans
that know this happened to homorectus in Java
and may well have happened to other species
they encountered as well.
Because I think the story I was given when I was a teenager,
when I was a kid was, and it was the kind of the bad news story,
it was a bit like Lord of the Flies, you know,
the humans are basically bad and that when we come into an area
where you perform some sort of genocidal practice
upon other people, I wonder if that was coming,
it's kind of in response to the bad news when we got out
after the Holocaust in a way that we knew suddenly
this unthinkable thing had been perpetrated
and we knew now that humans for sure were capable,
could be this evil, that we were inherently this evil
and therefore wherever we go we perform mass murder
on anything that looks a bit like us
but it might be a bit different.
But that's not really the case, that's changed now,
the conventional wisdom on that's changed.
Yeah, I definitely think it's more about modern humans
being able to adapt to certain conditions
and other hominins just not being able to adapt in the same way
so kind of out-competing them rather than, you know,
going in and taking over kind of thing.
So much of your work is done in caves?
Yes.
Kiro?
Yeah, I love caving.
You do?
Absolutely love it.
Really?
Yeah, I recently just a couple of weeks ago took all my students caving
and for some of them it's the first time they'd ever even been in a cave

and yeah, they loved it, absolutely loved it.
You're not claustrophobic?
No, I love it.
Can you wriggle through those tiny spaces?
Yeah, I feel very at home, I feel kind of,
it's kind of safe and warm and I love it.
I love the feeling.
Tell me about the Lida Ajit cave in Sumatra
and what you were looking for when you went there.
Yeah, so this is a cave that we didn't primarily excavate it.
It was all been excavated by a Dubois
like over a hundred years before
and he had found some modern human teeth
and he'd found evidence of this rainforest fauna
suggesting exactly the conditions for modern human dispersal
through Southeast Asia
and yet because it hadn't been properly dated
it just wasn't really on the map.
It wasn't on anyone's radar.
It was never even considered when they talk about human dispersal
and the models of human dispersal
and it just wasn't there because it hadn't been dated
and this is why dating is so incredible.
So we were determined to go back and find it
and so we had a copy of Dubois original map,
a hundred-year-old map.
It wasn't the actual original one, it was a photocopy
but we were kind of armed with this map.
We were kind of walking through the forest
trying to find the cave
and everyone had a different idea of which was Lida Ajit cave.
The locals all were like, oh, this one is it.
No, this one's it. They were all arguing about it
and they said, oh, look, there's one more we want to take you to
and I said, okay, so we headed up the hill slope a little bit further
and we walked into the entrance
and I literally had a eureka moment
because there was this big calcite column right there
and then you kind of go around this column
and then there's another chamber behind
and that's exactly what he drawn on this map
and I was like, this is it. This is the cave.
So we went back through to where we thought the fossil chamber was
and we found all these sediments, started picking around

and we instantly found an orangutan tooth
and that to me makes, okay, it's old.
There's something. This is the right kind of age.
So we picked around and we found all the same fauna
that Dubois had described from that cave.
So we took some samples for dating
and yeah, we came back and we dated it.
We got 73 to 63,000 for where the fossil had been deposited.
That's almost 20,000 years older
than any other age that had been established in Southeast Asia.
You mean a human fossil?
Yeah, so he had found the human fossil.
So we were able to reconstruct exactly where he had found it
in the cave and then go back 100 years later
and take sediments for dating.
And what does that tell you about human migration in this area?
Yeah, so it basically tells us that they left Africa much earlier
than had been anticipated
because to get to Sumatra by 70,000 or 70 to 60,000
they must have left Africa earlier
because some people were saying, you know,
they left Africa about 60,000 or so.
They have to get to Sumatra by 60,000.
So they had left Africa earlier.
They had come across to Southeast Asia
and arrived in Southeast Asia much earlier.
And was there a land bridge to Sumatra in those times?
Yeah, so if you look at what we call the continental shelf
or what we call Sunda, that's all one big land mass.
So especially in periods of low sea level,
you can walk straight down to that point.
So yeah, they could have got there quite easily.
And then that kind of opened up.
Well, that then has implications
for the timing that they got to Australia.
And luckily, a few months earlier,
Chris Clarkson had published the exceptional work
on Maja Bibi in Northern Ireland,
and they had a date of 65,000 of arriving in Australia.
And all of a sudden, it all just made sense.
70,000 in Sumatra, 65,000 in Australia.
And suddenly we had a pathway of modern humans,
an early population of modern humans
that arrived in Australia by 65.

Part of the thrill of this when you're telling me this
that sort of makes my imagination light up
is this feeling of deep time.
This feeling of trying to imagine how it was
in this time when humans travelled so far,
bit by bit by bit, and there were other kinds of humans.
These other kinds of humans that were there,
I think we know their head language,
or they would have had, I wonder if we can't tell from the fossil record
whether they had anything other than a grunt
or anything that was more complex than that.
I don't know.
But we know they have tools.
Is this the pleasure of you imagining
what these people did when they lived?
Like I said, it's like being in a time machine,
going back to a time.
And I strongly believe that humans dispersing
across Southeast Asia down into Australia,
it's our greatest human achievement.
It's incredible what we achieved all that time ago.
We go on about, oh, we've invented the wheel
and we've done this, and yeah, that is incredible.
But to me, it's still human dispersal.
I still think it's incredible
that we made it across the world.
From Africa to Australia.
So long ago, yeah, I mean, it's incredible, really.
And yet, we don't really know much about it.
We don't really know, you know,
we're still establishing when they arrived in Southeast Asia.
We're still arguing about when they first got to Australia.
And there's no real, I mean, there's, you know,
lots of people sort of swayed one way or the other,
but still it's not a huge consensus
on exactly when things happened.
And that's when dating just comes into play.
It's all about timing
and when things arrived in certain areas.
That's why human dispersal and dating go hand in hand.
They really do.
So now, Kira, I need you to tell me finally
about your next major project, The Hunt for the Giant Ape.
Tell me about this giant ape, please.

So there was a very large,
the largest ever primate to walk the planet.
Gigantopithecus blackie.
Gigantopithecus blackie, yeah.
Blackie, that's his name, yeah.
How big?
Three meters tall.
Oh.
Yeah.
Most closely related to an orangutan.
So it kind of branched off from the,
the Pongine sort of branch of the tree
before orangutans.
So you're saying if that ape walked into a room,
it would be crouched over to it.
Very much so.
It wouldn't be able to stand fully erect in...
I mean, it could stand erect,
but definitely would have probably walked around more
on its knuckles like an orangutan.
No, I'm talking about the height is what I'm saying.
Oh, yeah, no, three meters.
Yeah.
Absolutely massive.
Right, and where did this ape live
and what happened to it?
Yeah, so we know it was in Southern China,
or China mostly,
from about 1.5 million years ago.
And then it sort of had a range reduction.
So it's kind of the range reduced down.
And within its last few thousand years,
it was mostly in Southern China.
And so we've done a project the last three years
looking at sites.
We've excavated hundreds of caves,
but dated about 22 of them.
And looking at what happened to this giant ape,
it was the only primate to go extinct
in the last 2.6 million years.
We survived.
So why did we survive?
And this massive ape, very robust looking ape,
didn't survive.

So that's what we've been looking at the last three years or so,
trying to work out exactly when it went extinct
and looking at the causes for extinction,
which is really a story for all of us
about megafauna extinction.
Yeah, and that big wouldn't take a lot,
wouldn't be of a mind to take much back chat,
I would have thought.
Not a lot of back chat though.
Giganto, I think you're calling him.
Giganto, the giant ape.
Is it possible that humans hunted this ape to extinction
like humans did to so many megafauna?
We definitely know that humans were around at the same time.
300,000, they probably were,
definitely humans in Zikudi and in Northern China,
but we don't have any evidence
that spatially they were in the same area.
This is completely fascinating.
Are you looking for an entire skeleton of this beast,
or what are you...
No, so we only know Giganto because of a mandible,
so jawbone, and we've found about a thousand teeth,
but nothing else at the moment.
So we don't know anything about it, apart from a jawbone,
which we've made to rescale to work out its size and its height.
So at the moment where the big hunt is on
is to try and find something post-cranial,
something outside of the head area.
You see, I don't care so much about the Jurassic Park project
for dinosaurs, I want the megafauna to come back.
I know.
That would be so much cooler for me, I think,
to see these giant diprotodons, you know,
huge wombats, gigantic lizards, anyway.
That's just my thing.
I don't expect to get much purchase with that.
Kira, it's been amazing speaking with you.
It's a fantastic story. Thank you so much.
Thank you.
You've been listening to a podcast of Conversations
with Richard Feidler.
For more Conversations interviews, please go to the website
abc.net.au

slash Conversations.
As a combos fan, you love a cracking good story
and I've got one for you that's the kind of wild tale
that's told over a beer in the bar.
Only this one is all true.
This is sinking and this water's going to come in here
and drown me.
I'm Pia Wursu, the host of From the Dead,
season two of ABC's Expans podcast.
After a ship called the Blythe Star
sank without a trace 50 years ago,
10 crewmen were thrown into the most extreme fight
for survival and pushed beyond endurance.
I am stuck in a life raft. What did I do to deserve this?
From the Dead.
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