Entre Chien et Loup

NEIL SANDELL (author): Oh, Sadie.

MUSIC

PERRI: Sadie, you are a wolf. Even better, not even from the lineage of wolves that we know of now but of this kind of magical ancient wolf ancestor that is extinct now.

Dogs are the personification of an animal that is no longer alive, and our only link to that animal is these dogs that live with us, like you Sadie.

SERIES HOST: (Nahlah Ayed):

The archaeologist, Dr. Angela Perri, in conversation with Sadie, a dog. Well, not just any dog. The dog of "Ideas" contributor Neil Sandell.

SANDELL:

Well, Sadie looks like she gets out of bed every day and never looks in the mirror. She is a bit like an unmade bed. Long stretch body. Short, stubby legs. Long snout. Messy hair, very rumpled, which is really part of her charm.

SERIES HOST:

Sadie is a wirehaired dachshund. Nothing at all like a wolf. So how on earth did this unlikely creature -- did any of our dogs for that matter - descend from wolves? How is it that dogs were the first domesticated animals?

Neil Sandell begins his story with a curious expression he came upon while learning French. Entre chien et loup. He asked his friend Sebastian for a little help.

SEBASTIAN:

Entre chien et loup. So, what does it mean? “Entre chien et loup” means this moment of the day, where the evening is coming, but it's not quite still there. It's not clear whether you are in the evening time or in the daytime. And it, it describes also the light, which is in between, in between daylight and evening. It's the moment where you hesitate.

The words, if you were to translate it literally, it would mean between a dog and a wolf. So where does it come from? I don't know. Of course, you immediately think that maybe the dog would represent the day. And the wolf being the night, being maybe wilder than the dog.

MAN: Dogs are closer to wolves than they are to anything else.

WOMAN: Dogs were the beginning of everything. Dogs were the beginning of our understanding that a relationship with an animal can be more than wild.

SEBASTIAN:

“ Entre chien et loup” is this moment of the day where things are in between.

SANDELL:

I've been thinking a lot about that in between time. I picture looking across a valley at twilight. There's a silhouette of an animal in the distance so faint that I can't tell. Is it a dog or a wolf?

In the twilight of prehistory, for a very long time, there were only wolves. And then dogs and wolves. What happened in between?

Scientists have been peering into the mists of time trying to understand how it all began. What they know for sure is that dogs -- yes, like you Sadie – dogs evolved from wolves. Another thing they agree on: that dogs were the first domesticated animal. How that happened is a kind of prehistoric who-done-it. For the longest time…

KATHERINE LORD:

…The accepted idea was that humans domesticated dogs. We did it.

SANDELL:

That's Dr. Katherine Lord, an evolutionary biologist at the University of Massachusetts. We'll get to know her a little bit later.

This story of domestication -- that we did it -- comes in two versions. One version says it started with wolves and humans hunting together.

Angela Perri, an archaeologist at Durham University in Great Britain…

PERRI:

So, the hunting partnership hypothesis is that humans and wolves are both social creatures. We both exist in packs. We hunt together. We work together to bring down prey larger than ourselves. We're daylight hunters. And we have this very similar social structure where we go back to the home camp, right? And we work together to raise our young, and communal eating and things like that.

So, the social structure between wolves and humans, especially, you know, ancient hunter gatherer populations in Eurasia is very, very similar. And so that kind of similarity and social structure can really lead you to thinking, “well, why would wolves and humans not work together”?

So, the real issue with this goes back to the idea of humans and wolves were in close proximity for tens of thousands of years without the process of domestication. So, what would it have been that they would have woken up one day and said, “Okay, today is the day that we've decided we're going to try to work with wolves to, you know, take down prey together”?

And when I think about the process of being a hunter gatherer group in ancient Eurasia, living with predators, and dangerous predators all around you is a daily part of your life and a daily worry. Why you would consider creating some partnership with an animal you not only see as a dangerous predator, but also competition for prey, is really hard for

me to understand, as an archaeologist, as a person who, you know, works with wolves and dogs. How that process would have started, thinking about that it's not just a one way partnership, right. You would also have to get a population of wolves to somehow understand that they are to cooperate with you.

I don't know if you have ever tried to take a carcass or any kind of food away from a wolf once it has gotten its paws on it. But it's a very difficult process. So, really thinking through the intricacies of how that would work, leads me to believe that that's an unlikely process.

SANDELL:

If that's unlikely there is a second hypothesis of domestication. The same answer to who-done-it, but by a different method.

MIETJE GERMONPRE:

We believe that humans, modern humans, initiated this domestication.

I'm Mietje Germonpré. I work at Royal Belgian Institute of Natural Sciences. I study fossil mammals that lived here during the Ice Age, here in Belgium and in Northern Europe. And I also look at the interaction between human populations from the Ice Age and the mammals that are living during that time.

SANDELL: Dr. Germonpré has co-authored about 100 papers on these subjects.

GERMONPRE:

If we look at ethnographic data, we see that hunter gatherers, because agriculture did not exist yet, probably there was a special vision of modern humans towards the animal world. And we see that also in the cave paintings where animals, mammals, especially, are pictured.

So, they were very interested in knowing these animals. And they were also interested in using these animals. I think the easiest thing for them to consider to know animals is to bring them home, to kidnap pups, to bring them home, and to raise them.

And sometimes these pups could reproduce between themselves. And so, there was a new generation of pups. And people probably made a selection on those pups that were the most gentle or had the most positive reaction towards humans. And so, step by step, there was a selection on behaviour. And step by step, every new generation more docile, more friendly pups could be selected. So, after a number of generations, the first dogs emerged.

SANDELL: And why would they take wolf pups to begin with? What would be the reason?

GERMONPRE:

Well, there's probably several reasons. So, one of the reasons could be for the fur. We see this in ethnographic data that, for instance, in Mongolia or in Alaska, people capture pups, capture them in spring when they are just only a few days old. So, wolves and foxes for instance. And they raise them until the winter, so when the fur is really well developed and thick. And then the animals are killed to obtain the fur. So, that could be one reason.

We think that they could also do this for rituals. We have some evidence of skulls that are modified, for instance, brain cases that are perforated, which indicate that these animals had symbolic value. So, this could be two important reasons to a kidnap pups.

SANDELL:

...Mietje Germonpré in Brussels.

So, prehistoric humans kidnap wolf pups, select the gentle ones and breed them, generation after generation. Eventually, you get a tame animal that is a dog. Make sense? Well, not to this scientist. She's spent her fair share of time with wolves, especially during the first critical weeks of life.

KATHERINE LORD:

You have this huge problem, which is how do you get from a dog to a wolf on purpose with purposeful breeding. And the problem is that you have to go from a wild animal to a domestic animal.

I'm Katherine Lord. I am currently a postdoctoral fellow at University of Massachusetts Medical School. And I'm an evolutionary biologist. I study, mainly dogs and wolves.

SANDELL: You raised wolf puppies in your research.

LORD: Yes *(laughs)*

SANDELL: How many… how many times did you do that?

LORD: You know, I've done it enough that I've lost count and have to think really hard to remember exactly how many litters it was. I think I now have about 42 pups that I've raised or been involved in rearing. But it's enough that I've lost track.

SANDELL: And about that kidnapping hypothesis?

LORD:

(laughs) So, you have to imagine, here's this person who is hunting and gathering for their food. And, like all other animals that do this, is living on the edge of their ability to survive, right. They have to get more energy than they use. And I believe that they could have acquired wolf puppies. Let's say they could do that. And they got a litter of wolves. So, let's say four puppies.

And then somebody had to feed them somehow. No bottles. People have suggested women breastfed them, which having raised wolf puppies is a horrific idea to me. Even breastfeeding dog pups sounds a bit painful, but wolves in particular, have extremely sharp teeth. And when they don't get enough milk, they start biting really hard. Even their moms are not okay with this. And so the fact that a woman might potentially damage herself when she needs to feed her own child -- for wolf puppies, at that -- who need to eat every four hours on top of her own kid having to eat. That seems a little improbable. But let's say they do.

So, they raise them, and they keep them around them all the time so that they're social. Now the wolf pup is a year old. And it's going to want to go out and look for a mate, but you want it to mate with a specific individual who is more friendly. And you have a population of four right now. So, you don't have a big choice. But you somehow have to convince the wolf to mate with a wolf you want. This is not an easy thing to do.

You have no fencing. You have no leashes, and you can' t just put a wolf on a rope leash. It'll chew right out of it. You need some kind of chain or something to keep them where you want.

But even if you managed to get them to breed with the animal you want it to, now their pups are going to be just as wild as they were when they're born because the only thing you changed was the environment. Not the animal, right? So, you didn't change their genes when you socialize them. You only changed their environment. So, they start off right where their parents would have been. And so, it's going to take many, many generations to have any effect on getting you a dog. And you need a lot of animals to go through.

So now you have to multiply this process by hundreds and hundreds of animals. And it just sounds completely ridiculous. I don't see how it could possibly work...when you have this extremely simple -- Occam's razor, right -- you have this extremely simple environmental setup. And they do it for themselves.

SANDELL:

They do it for themselves. Self-domestication. Many of the scientists I spoke to believe this is the most likely answer to the who-done-it. But how would that work? Well, this man had some ideas.

RAYMOND COPPINGER *(actuality)*

I'm looking at behaviour from an evolutionary point of view. I think that all those behaviors, those snarls and growls, and everything else, are genetic. By the way, I don't think dogs are conscious. *(laughter)*

SANDELL: Raymond Coppinger. Biologist, author, provocateur.

LORD:

(laugh) He liked to be controversial. He liked to make people think. I first met him in my freshman year at Hampshire College and my very first semester, I took animal behaviour with Ray. And in a school of -- I think we had about 1200 students at that point -- that class sometimes had 100 kids in it because he was just such a fantastic lecturer. He was really good at teaching undergraduates how to think critically for themselves. I often refer to it as just -- he taught me how to think.

And he was also my mentor. For many, many years.

SANDELL:

In the 1980s, Raymond Coppinger started thinking about dogs from an evolutionary perspective. Working with his wife and co-author, Lorna, the Coppingers expanded on an earlier idea about dog domestication by the German archaeologist, Frederick Zeuner. It came to be known as the garbage dump hypothesis.

LORD:

That idea was that once humans started to settle, we produced a lot of garbage in one place, and that that new niche allowed for the evolution of species such as the dog to take advantage of it. And so, domestication actually occurred when, or the process of domestication occurred when dogs evolved to survive in this new niche.

SANDELL:

So instead of hunting for survival, ancient wolves found they could do better by becoming less like wolves.

LORD:

They became scavengers. And not only did they become scavengers, but they became scavengers who needed to get close to humans, because humans were creating the food

source. So, the ability to not only get closer, but to stay closer to humans, when they brought out trash became a really key evolutionary development.

So, we still have wolves who will scavenge at dumpsites. But they're out competed by dogs because of this one trait. We call it flight distance. So, how close will you let something frightening approach before you start to run? And then very closely tied to that is, how far away will you run once you start running?

And so, wolves classically have this very large flight distance. So, a wolf eating at a garbage dump tends to only do it at night when people aren't around. And when they sense the person approaching, usually because they smell them, they will start running. And they'll stay away. They'll run far and they don't come back for a while because it was scary.

A dog on the other hand, even a dog who grows up in a garbage dump, not a pet dog, a dog who's living in the garbage dump -- because they're so easy to socialize with people -- when a person comes, they just sort of shift over.

It's very much like the behaviour you see in a pigeon in the park. You can't catch the pigeon. You can't pat the pigeon, but you can get uncomfortably close to the pigeon before it starts to shift away from you and fly in their case.

So, they have really shortened flight distance. And that makes them really well adapted to survive in this niche because they're the first ones there. They aren't using up any energy running away from the people. They get the best food right away. And they don't have to lose out when more food comes. When the food comes, they’re right there ready for it. So, we think that may have been the key to allowing them to adapt to this new niche.

SANDELL:

You might have noticed that Katherine Lord mentioned free ranging dogs. These are dogs that just wander around human settlements. They're not pets. They're not abandoned. They’re village dogs. And the Coppingers studied them all over the world. Researchers like Dr. Sarah Marshall Pescini still do. She's with a Wolf Science Center in Austria.

PESCINI:

Free ranging dogs are the forgotten dog if you want. But I think they are a really important part of it, not just because numerically they're much more numerous than Western pet dogs. But also, because in a sense if we have any possibility of thinking about how dogs used to live, that's probably a closer model than our Western childlike way of treating dogs. So, I think they are a hugely important sort of population that needs more attention.

SANDELL:

Rough estimate: four out of five dogs in the world are free ranging. As Sarah Marshall Pescini said, how they live their lives gives us clues as to how prehistoric dogs lived theirs. Just a warning. This next part is kind of gross.

PESCINI:

If you will look at village dogs today, one of the biggest sources of foods that they actually utilize is human feces. So, we are effectively generating dog food machines in a sense. And if you do the analysis of the kind of nutrients that are in human feces, you discover that they're actually very good. So of course, we don't know exactly what the diet was then compared to what it is now. It could be that now we have much richer food. But still, the human feces I think played probably a considerably big part in all of this story.

SANDELL:

The story, if we're talking evolution, is what changes when wolves go from hunting, to scavenging. And one of the most remarkable changes is how they raised their young.

LORD:

Once you get rid of that hunting behaviour, and you switch over to scavenging, you no longer need as much parental care. So, wolves? They don't get really good at hunting till they're two or three years old. And then they only have a few good years in them

to really be the top hunter in their family. And then they rely on the younger animals after that.

So, they don't have more than one litter a year. Sometimes they have less. If it's bad year, they just keep taking care of those babies. And those babies stick around mom and dad for two years. So that's a lot of parental care.

Dogs have their pups, and then they're done with them at about 10 weeks of age in a free living population. And at that point, they're old enough to walk off and eat a rotten melon on their own. They still have a lot of competition with the bigger dogs, but they can do it. Moms can, on average, in a free living group have pups every eight months or so.

SANDELL:

Now, when you hear about all of these changes that happened in the past, you might think: “wait, are we talking about a wolf now or a dog?” Well, what we're talking about is that in between time, which gets us to some tricky questions, like when did domestication happen? And what do we mean by domestication anyway?

Angela Perri, Durham University…

PERRI:

Wolves reach the point where they are depending on humans for many parts of their survival. For example, they're depending on humans to make the final kill of prey and then to feed them that kill or to provide shelter, or protection or things like that.

The key point to really think about when it comes to domestication is that …domestication is not an event. It's not a thing that happened at a set point in time, and after that, you have a dog. It's a process that may have taken thousands of years to reach the point where both the wolves and humans identified themselves as kind of co-domesticating. *(MUSIC)*

That kind of process of moving from kind of a skittish scared animal to a shy but interested animal, then to an excitable, happy to see you animal is not an event that happens with a snap of the fingers but a process over time.

X-FADE MUSIC. SFX: Wolves howling.

SANDELL:

The evolution of the dog was a process that likely took thousands of years. And that makes it hard to pin down to a precise date. But at least maybe we can get closer. The first line of evidence: the ancient bones unearthed by archaeologists. Angela Perri…

PERRI:

For many, many decades now, we've been relying almost exclusively on the size and shape of bones to help us identify, what's a dog? What's a wolf? And it is subject to interpretation. One of the main issues that we have with this is we don't have a really great understanding of what wolf populations in Eurasia during the time period of dog domestication looked like.

So, we find remains at archaeological sites that are fairly old, somewhere around 40 - 30,000 years ago. We have a number of specimens, a number of bones from sites dated in that time period that are suspicious. They look potentially interesting, like they could potentially be something “not wolf”.

But it's not quite clear what they are. They could very easily be a wolf that's just a little bit different. Some kind of sub-population that we haven't identified previously. You know, they have a little shorter legs or little smaller teeth, or their snout is little bit shorter. Or their head is a little bit wider, or one of these indicating factors to us that triggers this idea that this might not be a wolf. But we really don't have enough evidence just from the bones alone to tell us. We've kind of reached the point in dog domestication work where the bones are not enough.

SANDELL:

The science of genomics could bring us closer to an answer. It's a field that's advancing with breathtaking speed. Greger Larson is a professor of evolutionary genomics at Oxford University, and he told me that when he was getting his PhD, sequencing ancient DNA would yield 80 base pairs. 80 points of data. That was 15 years ago. Today?

LARSON:

I just got off a meeting this morning. And we are talking about -- we've just generated from a single ancient dog, we've generated about 300 billion base pairs. So, in 15 years, we've gone from 80 to 300 billion.

SANDELL:

A firehose of data. You would think that would get us closer to answering when domestication happened. But no. There is still critical evidence that's missing. Gregor Larson's take is that the best science can do is set out a range of when it might have happened.

LARSON:

At about 40,000 years ago, it's fair to say that there were no dogs, that we had a lot of different wolf populations, including many that are now extinct all over Eurasia. But there were no dogs at 40,000.

And then there's a site of Bonn-Oberkassel in Germany, where has for a long time, there has been a dog that's been claimed there. And I think for the vast majority of the field, that's a pretty decent dog. It had some diseases that were then taken care of. It was cared for by people. It was intentionally interred. It looks more and more like a dog than it does a wolf. And so, there's a whole series of lines of evidence that suggests that 15,000 years ago in Germany, that you have a dog.

All the data that we have now -- and we're up to, I think 32 ancient genomes -- all the data right now is consistent with a single wolf population, leading to all the variability that we see in modern dogs.

So again, that population is now extinct. And what we'd really love to do is find some members of that wolf population, find the wolf that is actually closer to modern dogs... because at the moment, when we look at all ancient wolves and all modern wolves, none of them -- not a single population -- is any closer to all the modern dogs than any other wolf population. (*MUSIC)*

As of yet, despite lots of effort and lots of bones and lots of sequencing, we haven't found that smoking gun. We don't have the earliest dogs. We don't have the earliest wolves that lead to dogs. So, everything that we're doing is in this empty space.

SEBASTIAN: ...in between.

LORD:

I think what's really interesting about it is partly... this amazing shift that we've gotten between the dog and the wolf behaviourally. And that it happened with very little genetic change. So, there's a really complex interaction that gets us from gene to behaviour. How does the evolution of that small change in genes interact with early development and environmental change to get us this really very different animal.

FREDERICKE RANGE:

(German) Komm...komm...komm.

It's quite warm for them so they are hiding. We have to find them because they are hiding in the bushes. It's very green at the moment, and it's warm, and it's mid-day. So, they are taking their mid-day break.

My name is Fredericke Range. And I'm a professor researcher at the University of Veterinary Medicine in Vienna.

Now I see a wolf. We have one over here.

At the moment, we are at the Wolf Science Center in Lower Austria.

Nanuk. Nanuk-o. Hallo.

Nanuk and Una is also coming. So, these are tundra wolves. These two really like each other.

SANDELL:

Nanuk and Una are members of a pack of nine wolves. There's also a pack of dogs here. They live separately. Both packs roam around a forested enclosure of about two acres. Fredericke Range co-founded the Wolf Science Center in 2008. Her goal: to study the behavioural differences between wolves and dogs, side by side. I'm here to learn about the research. But there's another reason.

SANDELL: *(actuality)* Give…give me a moment. This is the first time I've seen wolves.

RANGE: What? Really?

SANDELL: Really. This is the first time I've seen wolves-

RANGE: -- but let's go to the other wolves because they are much more impressive. *(laughs)*

SANDELL: Okay. I'm already impressed.

SANDELL: Moments later, I'm standing two metres away from a large white wolf.

RANGE: Let's see if she greets. *Nanuk. Nanuk …Nanuk. Komm. Hallo. Hallo.*

I hand raised Nanuk. I didn't hand raise Una. I was hand raising my son at that time. But Nanuk knows me quite well.

SANDELL:

Hand raising the wolves and dogs allows the researchers to study them up close…to understand what makes the two species different.

RANGE:

The wolves are more self-secure in a way. They know what they want. Whereas the dogs are more… they need the human more in the sense that they are more comfortable if the human is around. I think they are more dependent on the human.

SANDELL:

The researchers here are interested in how the wolves and dogs cooperate with other members of their pack. So, they've set up experiments. For example, will they work together to pull a rope to get a reward?

Their findings? Wolves cooperate with each other really well. The dogs? Not so much.

RANGE:

The reason for that is not that the dogs are cognitively not as advanced. So, it's not that they don't understand what the whole thing is about because if you give them a human as a partner, they, for example, have no problem to solve the cooperative tasks. So, it's not about cognition. It's really more about these tolerances accepting each other, seeing each other as a cooperative partner.

And having said that, I don't really see that dogs see the humans as a cooperative partner in the sense that "OK, you tell me what to do, and I do it."

So, if I think about my children, for example, if I tell my son, please, can you set the table? And he does it, I very often say, "oh, you're really cooperative today". Right? Whereas what he did is basically, he followed my command, if I put it like that. And I think that's also characterizes in very many aspects the dog-human relationship. Wolves, on the other hand? They very often ask the human to come and follow them. Whereas the dog usually waits for the human to say, okay, follow me. Let's do it together,

SANDELL:

These differences between dogs and wolves: if it's not what you expected, you're not alone. Sarah Marshall Pescini started at the Wolf Science Center eight years ago. Looking back, it's been eye opening.

PESCINI:

Well, I guess there are some things that have surprised me or that when I imagined wolves and dogs before studying them. I wouldn't have suspected. There is this kind of idea that from wolves to dogs, dogs are kind of a nicer version than wolves.
Less aggressive, more tolerant, kind of more fuzzy, cuddly kind of animal. And I don't actually think that's true.

So, if you then look at and compare them, what you find is that wolves are outstandingly cooperative. Pretty tolerant with each other when it comes to sort of sharing food, which makes sense if you think that they have to hunt together and then share carcasses. Whereas dogs can actually be quite possessive. And there is this pretty strict hierarchy that dictates who has access to food.

So, this more tolerant version of dogs and sort of "big bad wolf" thing really just falls apart. And I think it's interesting it falls apart because it's… I mean, even in my head, that stereotype of the Big Bad Wolf and the nice fuzzy dog, still was there, even coming and working here. And that's radically changed. I think the levels of cooperation that dogs seem to reach are… For the moment, I really haven't seen it in dogs.

RANGE:

I think for the wolves, it's really important to keep the pack cohesion. Right? So, they are more or less dependent on the cooperation that works. So, I cannot just bite somebody else because that animal might then leave. So, I have to be careful about what I do. I have to think about my consequences to a certain degree. Whereas in the dogs, *pfft*, it doesn't matter. So, I mean, they don't need each other to survive.

SANDELL:

They don't need each other to survive because they depend on humans.

For wolves, though, pack cohesion is critical. And that means keeping their aggression in check with each other…and it seems with the humans who raised them.

RANGE:

They escalate slowly. So, they will first try to get out of the situation. Then they will growl. Then they might snap into the air just *(mouth sounds)*. And then I had one wolf at one point, when I didn't listen to all these signals, he was just really holding my arm with his jaw. He didn't bite. I didn't have any mark on my arm afterwards. He just holds it. But it was a clear warning. Okay, it's enough now. Stop it. It's enough.

So, they escalate very, very slowly. And this is also... it's not just towards humans. It's also within packs. So, they have a real nice escalation thing. And if you pay attention to the behaviour of the animals, you see it very clearly.

Dogs are very often much more reactive. They don't communicate. They don't communicate in the small steps. But very often, they just escalate, which then becomes dangerous.

SFX: dog snarling and barking

GIULIA CIMARELLI:

It seems that one of the earliest elements that changed in a dog in comparison to a wolf is the ability to bark. And it seems that humans are very sensitive to barks.

So, I'm Giulia Cimarelli. I am a postdoc researcher at the Domestication Lab of the University of Veterinary Medicine of Vienna, in Austria.

Many different canid species can bark, but dogs are the only species that seems to bark so much and have so many different types of barks. So, it is possible that one of the reasons is that this was something that brought some advantages to them when living alongside humans.

Humans seem to be even nowadays extremely sensitive to barks. They are as sensitive as when they hear children's crying. So, it seems that it's really triggering in us attention, and the willingness to stop the bark or to do something about it.

SANDELL:

Imagine this. It's a long time ago. And there's an early dog living at the edge of a camp of hunter gatherers. And an intruder approaches. The dog barks furiously.

For the humans, those barks are a warning.

CIMARELLI:

Basically, it is possible that there was a sort of parallel evolution of the fact that this kind of vocalization in dogs were most perceived by humans. So, they were then selecting, even indirectly, dogs that would bark in comparison to dogs who wouldn't bark. Because this was bringing an advantage to them.

MUSIC

SANDELL:

At some point, our ancestors figure something out: that these dogs just hanging around the camp could be useful for something. And when that happens, it's the dawning of something profound.

PERRI:

Very quickly, we learn that a dog can do things for us, that make our lives easier. They are the gateway to animals as biotechnology, to the understanding that a cow not only serves as a delicious hamburger, but also can pull your plough for you, and provide milk, and provide bones and horns for raw material resources.

So, this idea that, like an animal is not just an animal, but it can do stuff for you, is something that started with dogs, and that we figured out early on with dogs. And we kind of mutated to every other animal that we went on to domesticate.

SANDELL: And this gets at this underlying notion that you can somehow chart the evolution of humans by their use of tools.

PERRI: Exactly. And I think we focus a lot on physical tools that humans create. You know, bone tools and stone tools and, and things that we can see and touch and kind of manipulate. But the idea of the creation of living tools, of living biotechnology in the animals that we've domesticated, and our coevolution with those animals to use them.

I mean, we are still doing it now. Think about, you know, at Durham here we're training dogs to smell Covid. Right? And when you go to the airport, you have dogs that are sniffing out whether you brought back oranges with you from whatever place you were at. Or dogs are sniffing out cancer.

So, we're still doing it. We still use dogs as really important technology. And that started with hunter gatherers in the Paleolithic. So, it's just kind of amazing the evolution of our technology and understanding of using animals that began in the Paleolithic is still going on now.

SANDELL: What we're talking about here is the value that we humans put on dogs. Yes?

PERRI: Yeah. Yeah, of course.

SANDELL: And there's an arc to that. It's not like that you get more and more and more valuable.

PERRI: No, no.

SANDELL: Tell me about that.

PERRI: So, I think it's a sad story for dogs once agriculture comes along.

You know, once people figure out, we could settle here in this valley. We could just start growing some wheat or corn. And all this moving around, it's kind of a bummer. Why don't we just stay in one place, grow some crops, get ourselves some livestock, and just build a village from here.

Once the idea of food production moves away from wild hunting, the value of dogs seems to plummet at that point. So, you get dogs moving from being an important part of a tribe or a group, and almost being personified as another member of the group -- like a human member of the group... because we see burials of dogs associated with hunter gatherer groups, where there are very elaborate burials. They are very clearly cared for and put in these prepared pits. And they've got grave goods and all kinds of things. So,

there's clearly an association in hunter gatherer period that dogs in places where they're being used for hunting are important and treated very much like humans.

Once agriculture comes in, you start to see a bit of a shift. And I think when you're no longer depending on hunting for your primary source of food, then an animal who is important for that also goes by the wayside.

So, dogs move from this important person-like position to kind of pests and pariahs and they're kind of annoying under foot, and always begging for food and barking and biting your children and being generally a little bit annoying. Maybe you could have been okay with some of that when they were going out and hunting and bringing home food, but now they're not. And they're just being a little bit annoying. So, the treatment of dogs over time diminishes. You see them being used more often in ritual for sacrifice and things like that. So, this idea that a dog is really important, because it's doing something really important for you goes by the wayside.

SANDELL:

But all is not lost for dogs, because they weren't just useful as hunters or sentries, or bed warmers on a cold night.

PERRI:

We have some evidence of this pet-like treatment of dogs. Certainly, in the Roman period, you have evidence of people having pet dogs, lap dogs. But it was definitely when the Victorians came along. The Victorians had a great love of breeding and creating breeds. And when you watch for example the international kennel competitions of the toy breeds and the hunting breeds and the sporting breeds and things like that. This idea of creating very specific lineages and breeding of dogs is something that really came along not long ago with the Victorians.

And I think we're to the point now in Western culture where a dog does very little for the average dog owner aside from a deep, important emotional connection. And we shouldn't poopoo that. That's an incred- It's an incredibly important thing, right?

But we've gone very far from the creation of dogs as a sledding or hunting tool or sentry. Yet, they fulfill this important emotional attachment that we have with them. And that's almost unlike an attachment that we have with any other animal.

SANDELL:

That day we spoke, Angela Perri sat in a studio in England, and I was at home with Sadie at my feet. I had one last question, one that had been tugging at me since seeing those wolves in Austria. By accident or design we humans had changed wolves into dogs. They'd gone from hunters to scavengers, from wild to dependent. We'd changed them in a dozen ways.

SANDELL: How have dogs changed us?

PERRI: Wow. How have dogs changed us?

I think that…that dogs were the beginning of everything. Dogs were the beginning of our understanding that a relationship with an animal can be more than wild. That an animal can be part of the domestic sphere. That an animal is not just to be hunted or feared in the wild but can be part of our everyday lives–

SFX: dog grunting

SANDELL: --Can I ask you to pause just a moment because my domestic animal is making a lot of noise right now.

PERRI: *(laughs)*

SANDELL: -- rubbing her bum… *(laughter)*…So I'll be right back… just pause for a sec… *(MUSIC)*

…I'm back. I'm just putting on my earbuds again. Hang on…

PERRI: …I mean, when you talk about why would you domesticate a dog, I mean, look at their lives now. We feed them. We clean up their poo. We buy them really expensive toys and food. And I mean…they've like, they've really figured it out.

SANDELL: Like, they won.

PERRI: They really won.

MUSIC RESOLVES.