

Video Transcript – Webinar: Defrosting Neanderthals

Briana Pobiner: Hi, everyone. Welcome to our HOT Topic program today. My name is Briana Pobiner. We are going to give it a minute or two while everyone is logging on and getting their microphones or audio working. Hang tight for a few minutes while we let everyone log on. Thanks for joining our program today.

Briana Pobiner: Hi, everyone. Welcome to our program today. This is part of the National Museum of Natural History's monthly Human Origins program. My name is Briana Pobiner. I am a paleoanthropologist and educator **[00:01:00]** at the Smithsonian's National Museum of Natural History. We are going to give it a minute or so while everyone is logging on and getting their videos working, so just hang tight for about another minute or so while all of our participants are able to logon.

Briana Pobiner: Alright. Welcome, everybody. My name is Briana Pobiner. I am a paleoanthropologist and educator at the Smithsonian's National Museum of Natural History. Welcome to our monthly HOT Topic program, and HOT Topic stands for Human Origins Today. These are programs produced by a partnership between the Human Origins program and Office of Education at the National Museum of Natural History.

We just want to let everybody today know that we are using a webinar format **[00:02:00]** for this program. We cannot see you, we cannot hear you. The way the logistics for this program will work is that we will have a presenter who will give a presentation. She will share her screen and go through slides. After the presentation, we will do a Q&A where I will read off questions that you have typed into the Q&A. The presenter will answer them. Speaking of the Q&A, you will see these two chat bubbles at the bottom or at the top of your screen, depending on the device you are using. That is the place to write questions for our expert. We also want to let you know -- while the presentation is going on, I will turn off my video and I will be behind the scenes answering some of those questions, those that I am able to answer. We will save a lot of them to the end. Half of the hour we will be together will be presentation. The other half will be question and answer. **[00:03:00]**

I also want to let you know that this program is closed-captioned. You can click the "CC" button at the bottom or top of zoom to see the captions. This program is being recorded. The recording will be posted within two or three weeks on the National Museum of Natural History archive video website. We will provide a link in the Q&A. Also, this is special for this program, you will receive any mail after this program with a special discount code to order Rebecca's book. As I mentioned, this is part of a monthly program series, our hot topic program series. We are taking off for the month of December because we know it gets busy for everybody. We will be back in January. These programs are generally held on the third Thursday of the month.

Briana Pobiner: **[00:04:00]** Now, we are going to jump in and get started. I will introduce our speaker for today. Dr. Rebecca Wragg Sykes is an archaeologist, artist, and professional. She studied archaeology through to the PhD level. She was especially drawn to the ancient world of the Paleolithic. Her doctoral thesis, awarded in 2010, was the first synthesis for late Neanderthals in Britain. She has since acquired numerous publications on broader archaeology. Following a post-fellowship at the University of Bordeaux, since 2005, she has diversified into working outside of scientific research. Her current projects include the recent publication of her first book "Kindred," which is a deep dive into the 21st century of science and understanding of Neanderthals **[00:05:00]**, together with other popular science writing and creative science. I will ask her to share her screen to start the presentation. I will go on mute and turn off my video. Thank you and welcome, Rebecca.

Rebecca Wragg Sykes: Thank you very much for having me here. I am very excited to speak to everyone today and go full on Neanderthal. I will do my screen share.

Briana Pobiner: I forgot the title of this program is called "Defrosting Neanderthals," which I love.

Rebecca Wragg Sykes: Is that showing up? Is that good?

Briana Pobiner: Looks great.

Rebecca Wragg Sykes: Thanks for everybody being here and I hope this talk is enjoyable. "Defrosting Neanderthals," slightly silly title. This talk is really about **[00:06:00]** shifting our understanding about Neanderthals and how this is emerged from the archaeology and defrosting them into something a little bit more interesting. Let me just check why that is not forwarding.

If some of the audience may not know that much about Neanderthals, let me give a little bit of an intro. This is the past one million years of evolution. Hominids are members of the *Homo sapiens*. If you look at the one million years overall, the origins of where Neanderthals branch off from a shared common ancestor with us is somewhere around this point -- this is the slightly earlier branching with older species you might recognize. **[00:07:00]** At this point here, somewhere between 550 and 760,000 years ago, we branch off, do our own thing, so do the Neanderthals. A little bit later, from the neanderthal lineage come the Denisovans, a holy understood -- wholly understood -- misunderstood group. Neanderthals are actually very recent. The homo lineage goes back to million years. The oldest archaeology we know, the oldest stone artifacts, 3.3 million years. Although 550 700,000 years ago sounds like a long time, the Neanderthals are very recent in the overall scale of things, just as we are. We have sort of a parallel development. That is where they fit in.

[00:08:00] What are they? If you look at the picture on the left, these are two comparative skeletons. This is *Homo sapiens* male, and this -- male, and this is a neanderthal male. There are certainly clear differences. Differences with the rib cage being more flared out, the pelvic area is different, the skull shape is different, much bigger face. Various different things. The bones are also

thicker, but heavier. This is no missing link, no primitive, nothing like -- this is another type of human, parallel on a path with us, just a bit different. You can think of them as extremely capable, athletic and very impressive.

[00:09:00] Just to make the point very briefly that is sort of connected with the title, ever since they have been recognized as another sort of ancient kind of human from 1856 onwards, there was a real trend to understand Neanderthals as creatures of the ice. Certainly, they did live in cold climates during glacial periods, colder than today. They did not really like, truly polar arctic conditions. When you see these animals appear in the record, the Neanderthals tend to not be about. Equally, they also lived in interglacial periods. We are in an interglacial right now. They existed during at least one period in temperatures even warmer than today. Two to four degrees warmer.

[00:10:00] You should be thinking of them equally as creatures on the steppe, but also full forests, like up in Northern Europe when it was warmer, and the Mediterranean, warm woodlands, cross intersectional Asia as well. They are very diverse.

Where does all of the information come from that we are talking about? We have 160 years of history investigating Neanderthals. Obviously, since the days of the Victorians, archaeology itself has transformed. Today, 21st-century techniques, we basically are extremely careful to understand sites as a whole. We want to know about the formation history of sites so we can understand how things got in there, how the layer is built up, how they might interact with each other. Was there ever any disturbance, because if we don't do that, we can't fully understand **[00:11:00]** the reliability of the objects that we are looking out and how they may have related to each other in the past. The way we do that, we can scan whole sites using lasers, we can use proper surveying systems to individually record tiny pieces in 3D. And then, barcode them. Some sites use barcode systems and it all gets shoved into a database from which you can then analyze, but you can also do other cool stuff. You can project holy years in 3D and reconstruct -- whole light-years in 3 -- layers in 3D and reconstruct. We can zoom right in and look at the micro layers in half. These are tiny pieces of wood and bone and flint from within thin sections taken. **[00:12:00]** We can do astonishing stuff these days.

Where does that leave us? Although this is not going to be the main focus of the talk, I want to talk a little bit more about Neanderthals as engaging with materials. And then, I want to talk about aesthetics a little bit. What can we see in terms of any sort of info -- impressions of Neanderthals in an aesthetic sense, and then talk about sort of basically the ways that they dealt with the dead. I will just begin here with material engagements. This is important because so much of the Neanderthals 's world, all of the things they were doing in their lives, has really undergone a revolution in archaeology. We know the range of techniques we have for dating means we have a much better handle on when things happened, **[00:13:00]** but we also have a vast array of different methods and techniques for understanding all of the different kinds of stuff they used in their lives every day. What we see, no matter the kind of

material, is essentially that they were intensely interested in the quality of things. If we begin with stone -- this is the core I just showed you that was 3D. This was back when it was excavated. This is in Italy. This is a beautiful biface. Very different objects. Neanderthals everywhere were highly attuned to the quality of the stone that they used. We can see the same patterns for the place they would select the best rock available and use that preferentially for particular purposes. And then, they would **[00:14:00]** move it into different regions, but only if there was not already decent rock in that region to be moved or already available. They never moved poor quality rock around. That really speaks to an understanding of geological resources on a landscape scale.

Over here, short -- sort of join the plant. On here, is a piece of preserved organic material, which, when analyze, had a very high tannin content. This is probably a tiny scrap showing us some kind of use of oak bark, potentially for oak -- for leather. Then, we have objects. I'm going to move this video screen. We have wooden spears. Amazing, the craftsmanship in many of the wooden objects we see. **[00:15:00]** It has been really fascinating, modern research has shown that there were real considerations of the wood -- itself as a material and how you could treat the wood, if it is very hard, which you could burn first. Also, with spears in particular, they are selecting the hardest parts of the branches and trunks for the tips of these objects also as digging sticks. Also, they offset the way they are carving these objects across the grain. Less risk of splitting. And then, we can see here a very recent, amazing find which seems to be a twisted three-ply piece of thread, some kind of fiber. The analysis of that showed that it is conifer-based. That is either going to be bark or possibly roots. **[00:16:00]** Unique find from France, but like this piece, it sort of pulls out this knowledge of plants that we don't see because it is not generally preserved.

Over here, we get into bone so much more evidence now than there used to be four Neanderthals using bone, not to the extent that happened later with early *Homo sapiens*, but they are doing it. These objects, we believe these are skin working tools. There other things here like some points. They are rare, but there is more than we used to believe. If we can pick out other materials, this is a tool made on shell. Shell seems to be a little tradition going on around the Mediterranean the only Greece and Italy really, there is nothing in Iberia, although we know they are eating shellfish there. There are these intriguing patterns of interest in different kinds of materials. **[00:17:00]** A focus on the quality. As I was saying with the stone in the selection of different stones we can see here, they are actively choosing to use the ribs from the large animals available to them. In some sites, there are tons of reindeer, but they are using bison for these. They are very selective. This is the impression I want you to have. Aesthetics, a big subject to deal with.

I'm going to try to guide you through some of the more recent finds and just the interesting connections that we can start to draw between different materials and different things that Neanderthals seemed to have been interested in doing to materials. First of all, it is important to sort of defined, what do you mean by aesthetics and art? I don't use the word art because for

us, it has quite a specific meaning. We think of a western idea of art as being a thing that you make **[00:18:00]** that is then looked at. Or the meaning is afterwards. That is not necessarily the best way to understand any human culture. Perhaps music is a more relevant comparison when we are talking about aesthetics. Until recently, we could not record music and the meaning was in the moment. There is good evidence that many different artistic techniques, something similar is going on.

Can we see aesthetics in stone tools? It is very difficult. These objects here have sometimes been suggested as being selected because they are rock crystal. To us, they look beautiful. From this particular site, there is no evidence this stone was being treated any differently than all of the objects made from that stone. Similarly, this class of objects called biface. They're strikingly symmetric, most of them. **[00:19:00]** It is a feature that seems to be imposed early on when they make them, but they also re-sharpen these. Quite often, that leads to them becoming asymmetric. It is very tricky to do that, and there has been much more focus on how Neanderthals were making and using these objects and the life histories of these objects rather than the shape these days. We can find aesthetic interests elsewhere. We can look at what Neanderthals were doing in terms of the materiality of substances. The focus on their intentions and the level of interaction and experimentation created -- and creativity. This is something that has really begun emerging the past few decades. We have started to see how they manipulate substances.

Here, this is a piece of birch tar. This is a substance that you have to cook out of birchbark. **[00:20:00]** You have to use a relatively low oxygen atmosphere or the bar just burns. We keep finding more instances of this through time and across space in Europe. They are using this as an adhesive. This one, you have the impression of a stone tool, a wooden handle. Up here, these little lines, that is the impression of a thumbprint. An amazing piece. It gets more complicated and interesting. Birch tar is a great adhesive, but here, this is a piece from Italy where we have residues of pine resin, which is not so great as a material, except, they have mixed it with beeswax, which gives it a very similar good property as birch tar. Here, we can see transformation of substances in the birch tar. The metamorphosis into this tar and the active mixing of substances to **[00:21:00]** create something with new properties.

Then, we come onto the more tricky objects in terms of aesthetics and meanings and all of this. Engravings, markings, this is an area where as archaeologists have gotten more careful about what they dig up and keep and how they look at it, we have started to notice things. In some cases, things on the surface can look potentially interesting, but we are very careful, very conservative and how we analyze them. This is a stone tool where the original skin of the block of stone is over here. You can see these marks. Are they meaningful? Is that just scratching. In this case, it appears this is actually some kind of cleaning of the stone surface before it was knapped. There is no evidence this particular piece had anything other than a functional **[00:22:00]** purpose whereas this piece has been argued to be nothing to do with any sort of making it easier to map. It appears this has been done after this flake came

off and these lines are staying within the margin of the skin of the rock. What is going on there, we don't really know.

You start to take out further the idea of markings and choice and we can see here, this is a vertebra of a bear and where there are markings, there is no explanation for butchery. This is nothing to do with having top of the bear up, this has happened afterwards. But then, as we started to -- you see more of these in Europe. They are still rare, but they exist and there is this spread through time and space.

[00:23:00] This is a raven's wing bone. Here, we have a series of quite regular incisions. Again, there is no clear functional reason for that, but they are clearly incised and regularized. Similarly here, this is an intriguing piece from a French site. Hyena bone, this time. Again, very regular incisions and just here, this is a zoom in. There are more tiny incisions. This has been claimed potentially to be some kind of notation or perhaps a tally system. We don't really know, but this cannot be explained in a functional sense, and neither are either of these markings natural. This is from Gibraltar, found not that long ago. Large couch markings in the floor of the cave in Gibraltar. No **[00:24:00]** natural explanation that makes sense. It does seem to have been -- if you analyze the order in which they were formed, it seems to be something that took a long time. The rock is not that soft. This was a project.

Other kinds of aesthetics. Color use. There has been more and more recognition over the years that Neanderthals were collecting some kinds of natural mineral pigment. This is manganese. Some of the studies of larger percentages have found there is clear evidence they were using them to scrape things or the pigment was being scraped. Sometimes, it looks as if that was used to produce powder. This looks as if it was used on something soft as well. With manganese, there was recent work done that was found that it actually can act as an accelerant for fire lighting. **[00:25:00]** The case is out on that, but certainly, in some of these sites, we can tell from chemical analysis that Neanderthals were really selecting if you of this. It still was not random. They were actively selecting for that quality again. We have other kinds of pigments where things get more interesting. You have a connection here with pigment where there are marks on it again. Incisions that don't seem to be connected to making a powder or scratching to get the color off in any way. In this case, it is the surface itself that is marked.

Here, we have a shell from a Spanish site, potentially over 100,000 years old. The dating is not entirely clear for that. What is interesting is that inside the shell, it may have been for food use, there is a pigment mix. There were two different kind of mineral pigments here mixed with another substance as well. Again, this is similar to the adhesives. **[00:26:00]** We have really intriguing objects where you combine unusual objects with pigment.

Here, this is a natural geode from a site in Romania. Very heavy. It has been collected, maybe from relatively nearby, we are not sure. The outer surface has multiple pigments. Red and some kind of black as well. Next to that, this is from the same Italian site. This is a fossil shell. It had to have come from at

least 100 kilometers from the cave. Nothing to do with food. On the outside, the outer surface only, there is red pigment traces and also traces around here of abrasion of something soft. **[00:27:00]** It is the combination of unusual substances, of the application of pigments to surfaces, that make us reconsider lumps of pigment in other sites where there is no special connection.

Birds as well, there have been increasingly recognized that Neanderthals are eating all different kinds of birds, including birds of prey. In some places, especially on butchery of wings as if they are taking the primary flight feathers out. Some cases, perhaps skinning the wing. We are not sure what is going on, but there is also a thing with feet. Sometimes, talons might have some kind of functional purpose, but most of the time, you can do it equally well with a piece of stone. You could map something quickly. Are they interested in the talons themselves? **[00:28:00]** It appears there is research that shows in some sites, they are after these strong ligaments. Elsewhere, they are just interested in the talons.

There are work claims that these eight different pieces were perhaps jewelry. We don't have any evidence that there was ever an original association because this was a site dug in the 19th century. However, recent analysis found on one of them that there is pigment on this as well. Moreover, it is another pigment mix. The more you delve into things and the more you start to see connections between different realms of activity.

Here, this is a very strange place. This is the site in France. **[00:29:00]** I keep clicking because I am moving the video. It is basically a ring of broken off stalagmites very deep inside a cave in a hill 300 meters completely in the dark. It is 174,000 years old. Quite old even for Neanderthals. There is no natural way these circles could have formed. We can see that theme of quality and selection again because not only have a broken these off, but they select particular lengths and sizes for the ones they are using. Is burning this orange and red? We don't know what is going on. When you look at the structure of this in detail, you can see that there is stacking of pieces and even balancing. These pieces have been balanced inside these rings. **[00:30:00]** It raises questions. Can we call that some kind of architecture? Does it seem to be a living site? We don't know. There will be more work done on this. I will quickly finish because we have to do the death stuff.

There have been claims that Neanderthals made paintings on walls. This is based on three Spanish sites. This line here had a date to date on it from this little concretion that came out in Spain. We do not know if anybody else in Spain other than Neanderthals. Similarly, in another case, same project. This, you have to take a processed image to see it because it is so faded. This is a negative hand. This here, this could concretion, next to the thumb, **[00:31:00]** is the one that was dated. They came out with a date that was substantially older than any *Homo sapiens* archaeology known in western Europe. The issue is, there is a lot of controversy over the dating because there is -- it is quite hard to do dating for particular formations like these. I don't know about

those, but we can say that Neanderthals were very familiar with the shapes made by their bodies. We know they made lines. We can see that and other materials. Neanderthals these are foot -- these are Neanderthals foot and handprints. Perhaps it is not such a stretch if they are surrounded by prints of their bodies and animals all the time, maybe they would be interested in making representations using pigment.

I have not got very much longer in terms of my time. The death question **[00:32:00]** for Neanderthals is fascinating and extremely complex. People have been focused on the notion, are there burials, they bury their dead? A bit like the word art, burial has a really specific connotation of a nice, straight, laid out grave. We do not see that in Neanderthals. We see whole bodies or almost whole bodies preserved in a way that seemed to suggest that there was some kind of protection of the body simply because of its existence. We don't see whole animals' bodies in the sites. Some old sites have been reassessed in modern excavation or re-excavation. So this La Chapelle-aux-Saints. This was first dug up in 1908, one of the first Neanderthals planned burials. This was the pit as it was dug in 1909 when they took the photograph afterwards. **[00:33:00]** It was revisited in the 20th century by archaeologists. They took all of the rubbish out the had been left and found this depression again. Very subtle arguments about the layers and presence of sediments suggest that could have been dug -- dug, but it is not clear. Whatever happened in the cave is odd and interesting in the condition of the bones themselves are different to almost all of the animal bones. Other sites have not really clearly held up claims to burials. This is a well-preserved child, which seems to have somehow slid down into a cavity in the cave. The jury is out on what went on with that, it is an unusual preservation situation. This individual was **[00:34:00]** claimed to be covered with stones, some kind of actual chamber burial. We can't really tell. We can see there was most of a body in there, but perhaps, it fell down through a sinkhole. Then, we have new work happening. This is in Spain. Really impressive site. A massive hole inside a hill. The material was stuck on the side. From this huge slope of material, there are bodies from at least 10 Neanderthals. At least two which are quite complete, including a female. She appeared to be in a similar sideline posture.

Shanidar, a site strongly linked to the Smithsonian has been known since the 60's. -- 1960's. They found more remains **[00:35:00]** from individuals already known. This is the skull that was found next to the jaw. This is a famous burial. Claimed as a burial, but you can see, there is the head, the arms, the legs drawn up, a very interesting posture. Straight underneath that, was found another individual. Again, apparently laying on the side. This is the arm and hand bent over like that. There is going to be tons of analysis done on this. Interestingly, next to the hand, there is the fingers, is this. This is a stone flake. We did a little reconstruction as if the deceased is holding it. We don't know that for sure, but it is interesting and I'm interested to see what is going to come out of that. **[00:36:00]** Just to finish up is other things that were going on with the dead. Neanderthals were not just putting bodies in the ground or leaving them or somehow protecting them. They were also taking bodies apart. This is a new thing that has come out of modern work. We did know,

since the late Victorian period this was going on in some places. It seems to be much more widespread than was believed. In some cases, there is evidence they were eating the bodies, but not always. Certainly, there is an impression they were carefully taking them apart. Sometimes it seems to match what animals are doing, sometimes you get percentages of cut marks that it is a bit more intensively done. We do know in particular places, they are using some parts of the bodies. You start to have this interesting idea of the dead being brought back into the world of the living.

In particular sites, we can see real complexity and what is happening. That is the hyena bone with the markings on it. This comes from a French site. Hyenas are here, Neanderthals are doing something interesting with a hyena bone. Hiding these -- hyenas are also eating some of the Neanderthals' bones of the -- also eating some of the bones of the Neanderthals. There is real complexity in terms of what is happening with bodies.

We come out to very interesting, rare, but quite significant cases where parts of bodies are being used almost in spite of their ability. This is a French site, La Quina, where you have a butchered skull. This piece here is, again, **[00:38:00]** one of these toolmaking objects that has been used even though it is not very good for that. It is the only piece of skull used -- skull from any species used to make tools with. That seems a very interesting choice when almost always, Neanderthals are choosing leg bones for this. If we come to the site from the 19th century where they knew they were butchering Neanderthals. Cut marks here for taking tongues out and things. On this skull, appear, there are more than 30 tiny little cuts. Nothing to do with butchery. There is no explanation for that. Again, they echo a lot of the market-making, very regular, very clearly done intentional. Something is happening with the treatment of the dead in some places that goes eons and expectations we might have about how one should bury the dead or anything. We have to open up our own understanding of what we should be looking for. The more that you look at different realms, you start to see these connections between surfaces and marking and color.

I want to finish. For me, Neanderthals are everything we see in the archaeology. All of the more recent work done and the different techniques. It all comes together to bring out this view of them as skilled. They are curious about materials, adaptable, hugely different environments and climates. They were flexible and experimented. They were aware of different material properties and were creative enough to try and actually manipulate substances **[00:40:00]** to create their own substances. Birch tar is the first synthetic substance ever made. This is the impression I want to leave us with. Moving away from these early images of Neanderthals as very apelike, aggressive, almost depressed to be alive, this one over here. This is where we are with 21st century understanding of Neanderthals. They are sophisticated, they have rich, emotional lives. They are humans of a different kind and they would be looking back at you curiosity. Thank you very much for listening.

Briana Pobiner: Thank you, that was wonderful. I appreciated all of the detail that went into that and we have a bunch of questions. I have been able to answer a few of them, but I decided to ask you more. I'm going to combine some. The first is a question that was also asked similarly by someone else. Did they have language and wasn't as complex as our modern languages are? Nona asked, what do we know about their way of communication?

Rebecca Wragg Sykes: Basically, we don't know anything about the complexity of the language, specifically. What we can say is that they were able to vocalize. We know from the inner ear anatomy that their hearing is tuned into the same kind of frequencies ours is tuned into, which is human speech. However, in terms of what they may have talked about, that is where it gets difficult. What I'm doing now, I am thinking ahead in my sentence structure, it is very complicated, I'm stringing different ideas together and controlling my breathing. Could they do that? We can't really tell for sure. **[00:42:00]** It does look like they were not as poorly anatomically equipped as we used to believe. The other argument is what does the archaeology say? We can see where there are high levels of skill. Could you learn how to make birch tar without some sort of communication on that level? Collaborative hunting, that is going on. How do you plan a hunt? Lions managed to do it, but they are equipped with very different weapons than us. If you are ambushing, can you do that without communication? I don't think it is going to be anything like what we are doing now. That is where I will leave it.

Briana Pobiner: I think that is one of those questions that is so difficult to answer about the past. Do we know what the total population of Neanderthals was at any one time? And then, is there any indication of the size of groups?

Rebecca Wragg Sykes: First of all, with total population size, we would expect it to be very small, these are hunter gatherers living very dispersed across the landscape. Probably, based on genetics and things, this probably was no more than 10,000 odd Neanderthals in Europe. They were into West Asia as well. In the thousands. Low tens of thousands. I don't think people would argue for 20,000. It is very few. In terms of the group size, super difficult question. I dedicate a lot of the book in one chapter to that because it is such a hard question to answer. Everything we see, we don't see any clear sites where there are obviously large numbers of people at the same time. **[00:44:00]** But we have to assess that in really careful ways. If you have a cave where you have got 60 hearths in one excavated layer, which of those are contemporary? How do you work that out? You basically do it by trying to get the finest separation in terms of sediments between the hearths and try to look for connections between them by objects, broken pieces of bones. The amount of analysis and work the archaeologists do to answer the question is huge. The answer seems to be in some sites, there may have been two or three hearths

we can see that were probably active at the same time. Maybe a group of 15 or less. In other places, they are repeatedly visited and it is only ever one hearths. Sometimes, the number of stone artifacts is less than 100 or even less than that. Maybe three or four people staying for a night and going again. There is diversity. It looks as if perhaps they may have been splitting the group up sometimes and coming back together exactly as we see hunter gatherers do.

Briana Pobiner: Also, prehistoric demography is hard to get out. Thank you so much for the great talk. I wonder what your thoughts are with evidence of caregiving such as the elderly and potential implications for interpreting some sort of concept of community among Neanderthals.

Rebecca Wragg Sykes: I think there would definitely have been a community sense. Neanderthals are very close to us. However, we don't have any other living homonyms to watch, so we have to look at our closest living relatives. Their lives are absolutely based in emotional connections to each other. Chimpanzees, there's a lot of aggression. They understand [00:46:00] to which community they belong. In terms of active care, it is quite surprising how much damage and how many teeth a chimpanzee can use and still stagger on and survive. Things like saying, this one had lost all of its teeth -- that is not so sure. There are definitely cases where individuals have been so unlucky, basically. He encountered many different injuries. Not all Neanderthals are completely battered, but he had a terrible injury on the face, was probably limping for much of his life, but we can see you maintain high activity levels. He never would have been able to hunt. He potentially could have adjusted his mapping technique. I think him and a couple of others would have needed some kind of provisioning. A cut on the head would have been a serious injury and they would have struggled for a week or so to feed themselves and things. That is as far as I want to go.

Briana Pobiner: How do you determine if an object was crafted by Neanderthals or *Homo sapiens*?

Rebecca Wragg Sykes: That issue is becoming more problematic. After 50,000, it can get a little bit difficult. What we have to do in those cases is look at the similarity overall of the technologies used and make a judgment. If you have fossils or DNA in your layers and say you are in France 200,000 years ago, [00:48:00] it is pretty likely that is going to be Neanderthals. There are debates between the later age range where we see sort of *Homo sapiens* inching into Europe 43,000 or 45,000 years ago at the same time Neanderthals are in western Europe. At that point, the question of who is making some of the final industries comes down to a question of can you see mixing of techniques? That has been claimed for a long time that there was what was called transitional industries.

With most of those, the cases where it did look like there was neanderthal type technology mixed with *Homo sapiens* are from older sites we dug up a while ago where there is evidence of mixing. When you excavate with modern techniques in clean conditions, that becomes much less obvious. The distinction is clearer. It is one of the biggest debates as to what is going on at the end.

Briana Pobiner: That is fair with two species being in the same place at the same time clearly coming into contact with each other. One asks, could the markings be a signature of sorts, a mark to show who it belongs and another asks, could they be some kind of time marking like the larger ones are days and smaller ones are ours? -- hours?

Rebecca Wragg Sykes: I think the idea of the markings being notational, in that sense, actually signifying information [00:50:00] is interesting. There has been a case made as to some kind of tally system rather than a number system. That is probably an older way of doing things. Amounts of stuff is innate. It emerges in children. Even, we see that in other animals. The idea that Neanderthals had some kind of interest in the amount of things or the day or number of things, I don't necessarily see a problem with that. That hyena bone where you have big marks and little one, is that signifying a different kind of information? Don't know. The idea of ownership, it is possible. Sometimes there is a lot of commonly owned stuff, other people have their personal gear. Sometimes, you have things that are marked to show affiliation. I don't think we can say that about this material because it is rare. I've showed you all the good stuff, basically. It is a lot more prevalent than it used to be. It is not anywhere near as common. The marking of things completely explodes in terms of frequency. [00:52:00]

Briana Pobiner: Speaking of ownership, this is a twist on the ownership question. You mentioned a thumbprint on one of the tools. Were there any attempts to analyze fingerprints, if possible to compare to one of a modern human fingerprint?

Rebecca Wragg Sykes: I don't think that has been compared. It is pretty partial. I don't think there are any other fingerprints cases. There is the handprint, that is the only handprint. There are other sites where there are footprints. I don't think there is anything that is preserved fine enough or you could do it. I'm not sure why you would do it either because we know from the skeletons that Neanderthals hands are a little bit different. The final joint, they have much more flared fingertips. What that looks like in the flesh, we don't know. We can see the impression of it, but I don't know what you would learn by doing it.

Briana Pobiner: James asks, have they been additional neanderthal cave art identified similar to that found in Spain?

Rebecca Wragg Sykes: No. There is only that one line with the date over it. All the rest of the flow stone dates from that cave are younger than 40,000. That really stands out in that cave. It is odd. Within another cave where there's tons of handprints where the dating is **[00:54:00]** much later. Those are all minimum dates. There is one other place where there may be some red pigment, but very small blobs of it. From a French site. That has indirect dating and the cave was filled after 40,000 years ago and this stuff was on the wall and had already been covered. That implies it is older than that. It is minimal in terms of the amount of pigment there and it is not ideal in terms of claiming it as a Neanderthals site. There is nothing else where we can see pigment on walls. Equally, we should remember that in South Africa, we have early Homo sapiens, 40,000, 80,000, 100,000, they are really interested in pigment again. Getting pigment powder off. Sometimes, it is sizing. We see more complicated geometric incisions. There is even a little paint kit from a site in South Africa where there are lumps of pigment and it is inside a shell. There is no cave paintings from there. Is that because they didn't do it, or because the preservation is not enough? Our expectations for what one should see in order for pigment used to be meaningful we are questioning.

Briana Pobiner: We will do a few more questions. Did they wear clothing?

Rebecca Wragg Sykes: Good question. I think the general opinion would be now that during some of the colder periods, they pretty much had to have some kind of body covering **[00:56:00]** and a loose skin flapping in the wind is not going to cut it. There had to be some kind of broad tailoring to the shape of the body. We have abundant evidence they were really into working animal skins. We can see they are doing the first gory bit where you get all of the skin and fat off. They are presumably moving them elsewhere to process. In some places, we have evidence of polish on tools, which has to be from dry skin working. This is a secondary phase. There are hints of a couple of fires in some sites. With a burning properly rotten wood? Which they don't normally do. That is exactly the kind of wood you need to smoke. There is that one site in Germany where you have got that tiny little piece of organic stuff on that stone flake and it is oak tannins. That is exactly the best kind of tree to choose in a forest environment for tanning. I think overall, it makes sense to imagine, what are they doing with all of this hide working we can see? Also baby wraps, carrying babies around is a real pain. Maybe partly, all of this skin working is to help people have their hands-free as they are trying to lift -- live their lives. We assume there is no reason why women would have not been involved at least

in some level of hunting. We can see evidence for this indifferent hunter gatherer groups. Perhaps baby wraps as part of it.

Briana Pobiner:

I like that idea of using baby wraps, myself. I'm going to combine two questions and several people have asked questions like this. What happened to Neanderthals? Did they die out or mingle with *Homo sapiens*? [00:58:00] Another asks, given how similar they are and because they interbred with us to produce fertile offspring, why do we still consider them a separate species?

Rebecca Wragg Sykes:

What happened to them, I will do that after. Species definitions are quite complicated. One of them is interbreed. In terms of biological reality, it is a bit more nuanced. When you have two populations that separated the same amount of time ago as ours did with Neanderthals 700,000 years ago, that is the same as chimpanzees and bonobos and they are physically different. They have remained separated for the whole time. Are they different species? Presumably, they can breed. It is about how long ago your population separated. The word that is used to sometimes is this idea of a cow can breed with a yet and think -- yak and things like that. If there was interbreeding, and we know there was, we now have multiple different strands of evidence telling us there were phases of time when interbreeding happened going back before 200,000 years ago. If this was going on, why did Neanderthals, all the way through to 40,000 years ago, still look like Neanderthals and why do we still not look like Neanderthals. It is because the amount and scale is not enough. It is not an assimilation, basically. We know it is happening early, and again, there seems to be the period of interbreeding that explains the genetic legacy that is in most living people today around 55,000 years ago. [01:00:00] There is other interbreeding happening later, probably around 40,000. We can see the signature for that only in some of the early *Homo sapiens* fossils. Their descendants did not carry on and contribute to living people. There was never an assimilation, but it happened all the way through. There seems to be an openness to not only sex, but raising babies is also the other thing we have got to remember. You are talking about hybrid children who have to be able to survive in whichever group. We know some of them are in Neanderthals groups and some are in *Homo sapiens* groups. The wet happened to them, the horrible question nobody wants to answer. I think overall, although everything we see about them says they were very successful for a long time, and much earlier *Homo sapiens* in Southern Africa and things, there is not that much different. There are some small differences behaviorally, but really, something I think is outweighs the claims for the climate was terrible, Neanderthals have coped with fluctuating climates before, as we know, it was around 40,000 years ago. What we can see in terms of a real difference comes from the genetics where although it looks as if Neanderthals and early *Homo sapiens* were existing in tiny numbers in the landscape, what we see is that overall, it appears Neanderthals were more genetically isolated from each other. They were probably living in smaller commuting populations. In some cases, they

appear to be actually inbreeding. We have **[01:02:00]** incest level relationships in one individual. We cannot say that for all of them, but when we look at the few early Homo sapiens fossils from 45,000 to 40,000, we don't see that same impression in very small breeding populations. It looks as if they are more interconnected with each other. There may be some kind of new or more intensely organized society that led to some kind of greater success and ability to perhaps support each other or be in particular places when it is needed. Perhaps they were able to plan and predict things to allow them to take advantage of herd or things like this. I think it comes down to degrees of difference. The climate is going to be part of that because we know the animals were being affected. It was not a great time. It was deteriorating. It is multiple threads, I think.

Briana Pobiner: I would have ended on the last question, but I'm going to exercise interviewer privilege to ask one of my own. I apologize for the 40 questions that are still waiting for you. My question, because I got this question before and really enjoyed it, if you had a time machine, what would you want to go back and witness about Neanderthals? Is it something mundane like them all sitting around the fire eating dinner? Is it them burying their dead? Making tools are making art or jewelry? What would you want to see?

Rebecca Wragg Sykes: We have got quite a good understanding of what they did with substances. We're getting a better understanding of what they did with the dead. I would like to see what they did when they were just chilling out. There is always some downtime. **[01:04:00]** What were they doing sitting around the embers of their fire in Spain 50,000 years ago? Their bellies full of red deer from the woods. What did they do in the evenings as the stars were coming out and stuff? I think that would reveal so much about the experience of being a neanderthal.

Briana Pobiner: I agree, the daily things that don't preserve.

Rebecca Wragg Sykes: I want to know what they carried in their pockets in their bags. What did they have on them every day?

Briana Pobiner: What was so important for them to carry around? Thank you so much. This was fantastic. Thank you, everybody for joining us. I apologize for the dozens of questions we were not able to get to. As a reminder, this talk has been recorded and will be posted to the national museum of natural history video webinar archive page within two or three weeks. Everybody who is here today will get a follow-up email with a special discount code to order Rebecca's

book. Excellent. Thank you all for coming and stay tuned with -- about an announcement about when we pick back up again in January. Thank you so much.

Rebecca Wragg Sykes: Thank you, everybody for coming. It has been a pleasure.

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