BONES DON'T LIE

Nancy: They came from across northern Norway. Others hailed from the area around Oslo Fjord. A surprising number died in horrible ways – their skulls bashed, axes or swords cutting into their thighs or backs, arrows piercing their bones.

And they were Vikings. Or more specifically, Vikings from what we now call Norway.
Lisa: Yeah, it was a lot of violence in the relatively few human remains that we had to examine.

Nancy: That's Lisa Strand, who has recently completed her PhD here at NTNU, the Norwegian University of Science and Technology. She's an osteologist, which means she's an expert at studying bones.

More and more, scientists are able use your bones to decode your life's journey. They hold chemical traces of the places you've lived, the illnesses you've endured, and especially clues about how you died. That's particularly true for societies from the distant past, like the Vikings, where there are few written records to help us understand these ancient worlds.

Nancy: Among the records that we have, though, you can get a sense of just how violent the Vikings could be. Alcuin was a cleric and scholar from York who resided at the court of Charlemagne when the first recorded attack of Vikings took place in Lindisfarne, an island on the northeast coast of England, in 793. He described the attack like this: Heathens desecrated God's sanctuaries, and poured the blood of saints within the compass of the altar, destroyed the house of our hope, trampled the bodies of saints in God's temple like animal dung in the street…"

And the Norwegian Viking bones that Lisa looked at certainly support that perception.

But as Lisa and an international coalition of researchers found out, things were quite a bit different when they looked across the North Sea at one of these Vikings' nearest neighbors – the area we now call Denmark.

Lisa: It was kind of incredible.

Nancy: I'm Nancy Bazilchuk, and you're listening to 63 Degrees North, an original podcast from NTNU, the Norwegian University of Science and Technology.

Today, I'm going to tell you the fascinating story about how four experts—an archaeologist, an osteologist, a sociologist, and a specialist in Viking runes—teamed up to challenge the common idea that Vikings were just a single, lawless group of marauding warriors.

Their research took them deep into the past, analysing Viking-age skeletons, deciphering ancient runes, studying massive earthworks, and examining the objects Vikings chose to bury with their dead. And what they discovered paints a far more complex picture of Viking society than most of us imagine.

And that brings me back to Lisa, looking at Viking bones.

Nancy: Lisa looked at Iron-Age and Viking bones that are housed in a collection at the University of Oslo.

Lisa: You open this door. It's very heavy and you go down very steep stairs. And when you come to this floor, you have huge cabinets with craniums. So it's craniums on that floor. It's only cabinets with craniums, if I remember correctly.

Nancy: The formal name of the collection is the Biological Anthropology Collection at the University of Oslo, but everyone calls it the Schreiner Collection, named for the collection's first curator, Professor Kristian Emil

Schreiner. It holds about 8500 skeletons that date from the Stone Age up to the 19th century.

Nancy: The bones that are associated with the craniums are kept on a different floor, in boxes. Lisa would also look at these, after she had examined the skulls first.

As a practiced osteologist, Lisa can look at these ancient skulls and learn a lot. She recorded all of her observations, including whether or not the skulls showed signs of being struck in a way that would have led to the person's death.

Lisa: My main task and my PhD was to examine these individuals further with isotopic sampling and osteological analysis, health analysis. And, so I just added the violence for this, because I could actually do it at the same time.

Nancy: So what does the skull of a person who has bashed in the head actually look like?

Lisa:It actually either looks like cut marks or if it's blunt, you see a depression, for instance, in the cranium. If you've been smashed in the head, you see a crack, almost like a solar crack, you know? It is very distinctive. And if you know how the bone reacts, when it's done in living bone, you can, separate it from when it's been done in bones from skeletal remains, you know? So you have to have learned this, but when you have, it's quite easy to see.

Nancy: And once she was done…

Lisa: You put it back to the place where it should be.. And then go down the stairs and collect the box where the rest of the remains are.

Nancy: When Lisa looked at the remains of the skeletons that were associated with the skulls, she saw clues to how that person lived, and what ailed them during their lives. But here, she also saw evidence of violence.

Lisa: Do we see any types of pathology, diseases? Do we see wear and tear? You know, when you work a whole life, you have enlargements of the muscles, you have may have rips in the tendons, you see where the muscles obviously have some issues, and they make marks on the bones.

Lisa: And you of course have violence. Have they been part of a fight, for instance, have they been killed during a fight? Do we see these axe marks and swords marks and arrow signs of like, everything?

Nancy: In the end, Lisa looked at 30 skulls and skeletons in Norway. All told, 60 per cent showed weapons-related trauma. Many were healed injuries, which suggests that it wasn't that unusual for people to be subject to violent attacks during their lifetimes. But what was even more impressive was that 37 per cent of the skeletons showed evidence of violent injuries that killed them.

Nancy: So ….does that mean that Norwegian Vikings were extremely violent? It kind of seems like it…

Here I have to quote what the Yale professor and data visualization guru Edward Tufte likes to say, "compared to what?"

You need to be able to compare this number to other relevant information to know if it's a big number of not. Because…maybe that's just how all Vikings were!

Nancy: And here's where fate comes in, in the form of one of Lisa's PhD supervisors, the archaeologist Jan Bill, who also happens to be the curator of the Viking Ship Museum at the University of Oslo.

In 2017, Jan met an American sociologist, David Jacobson, at a reception. David, who is a sociology professor at the University of South Florida, had just come to Norway as a Fulbright scholar.

They got chatting. One of David's areas of expertise was on patterns of violence in societies, globally and especially in West Africa.

David: I was looking at some extremely violent groups around the world and seeking to understand the factors that, not so much about the groups themselves, but the social economic, political environment in which they won support from the populace. In particular, I was looking at Boko Haram in Nigeria.

Nancy: At the same time, Jan had been working on the Gokstad ship burial, holding possibly the most famous Viking ship in the world. You've almost certainly seen a photo of it, with its sleek overlapping planks curving up to the bowsprit. I'll post a link to a picture in the show notes. The ship was buried containing the bones of 12 horses, six dogs, two peacocks. And… one man.

Jan: So we have a man apparently dead in battle and we have this magnificent grave, which highly indicates that he was on very top level society, a king or something like that. **Jan**: (06:08) I was interested in what kind of situation would have brought about this ship burial.

Jan: And that's when I met Dave. …And he then told me about his research, which was very much about how violence in society was not just a random thing, but was a consequence of the social structure.

Nancy: Now here's the tantalizing challenge facing archaeologists like Bill and his colleagues, trying to learn about the social structure of a society that is more than 1000 years old.

Think of it as equivalent of looking at an elephant through a straw. You can see little bits and pieces of something consequential, but it's very challenging to fully put the pieces together.

One critical point is understanding violence in Viking culture overall. Was it the same across Scandinavia? David says there is strong research showing that societies that are more structured, with stronger political authorities, have become less violent over the centuries.

David: Do we see that pattern playing out in the case of Scandinavia, and comparing the regions of Norway and Denmark in this regard?

Nancy: Lisa had already documented the percentage of violent deaths in the Norwegian Viking age skeletons. And remember, that percentage *seemed* VERY high.

David: The scale of the differences in skeletal trauma, that was extraordinary, close to 40%, based on that sample of Norwegians, in the Viking age were dying of violent death. I mean, those numbers are extraordinary.

Nancy: So they decided to use Denmark as a comparison, because a Danish researcher, Pia Bennike, had already looked at hundreds of skeletons for her PhD research in the 1980s and had thoroughly documented the cause of death.

Nancy: Of the Danish Viking Age skeletons that Pia had looked at, 82 had skulls that she could examine. And here's the thing: Just 6 showed evidence of a violent death! That's 7 per cent!

David, who you will remember, studies violence in different societies, was just blown away by this difference. And he knows the numbers that can put this level of violence into perspective.

David: If we look at pre-state societies, there's a broad range, but it averages around 25% from skeletal studies dying violently. In the modern world,our data for parts of Africa is pretty thin, but of those where we have good records, the worst case is Honduras, where 7% of males will die of violent death. That's the aggregate. So you've gotta think (that for) young males in poor areas in the cities, the numbers are a lot worse. In Denmark, it was Honduras levels, right? About 7%. But in the context of Scandinavia, in the Viking age, that's very low.

Nancy: And even more surprising was that virtually all of those Danish Vikings had been executed – by having their heads cut off! That's not something you do in battle, Lisa told me.

Lisa: It's quite time consuming to decapitate someone, even if you are in a battle. You don't take time to cut their head off. No, no. It's quite grim, but it's true.

Nancy: This was a critical clue for the research team, because it suggests that there were people in Denmark, people who were a strong leaders, who had enough power to order an execution.

David: The fact that in Denmark, we're seeing mostly executions, points to the idea of a more centralized authority.

Nancy: But could the team find other evidence to support this idea? David knew that the more powerful that state authorities were in a society, the less violence there was in that society. Could the researchers find evidence of this in Viking culture?

Jan: And then David asked me how how do we see social stratification and the social pyramid? How is that reflected in the sources?

Nancy: Just a little translation here: when Jan uses the phrase "social pyramid", he means how structured a society is. A strong social pyramid has many layers, with the most privileged and powerful individuals at the top and the least privileged at the base, reflecting unequal distributions of wealth, power, and status. So societies that are based on clans would have a smaller, less developed social pyramid than those with a king.

Nancy: Figuring out the actual structure of these two societies would require finding puzzle pieces that all fit together in the end – except that the researchers had to do some sleuthing to figure out what the pieces were!

David: The next question is what are the proxies for getting at violence on the one hand and getting at increasing state authority and centralization on the other hand? So that's the way we went in.

Nancy: But….

David: As you think through these proxies, it's not self-evident necessarily what to draw on.

Nancy: Some evidence showed up almost by chance. Like runestones from both Norway and Denmark.

Here, Susanne Nagel, who had previously done a master's degree at the University of Oslo and the University of Iceland on homicide and suicide in Viking societies, had some surprising information to contribute.

Runestones are actual stones with runes, or inscriptions that are erected to commemorate someone. But the someones were different in the two places.

Jan: Suzy actually came and told us that she had been going through the runestones from Norway and Denmark, and she had observed that in the Danish runestones, you had a feature that you did not have at all in Norway. And that was mentioning the titles of the people who were either erecting the stones or being commemorated on them. Here we suddenly see a difference between a Norwegian society where your family relation was always on the stone, but never your office or your social position. But when you looked at the Danish material, you would also have the family names but then in some instances, you would have their social position.

Nancy: That *might* mean that Norwegians were more informal, *or* that they didn't have a social structure where it was common to have titles attached to your name. But the researchers took this as evidence that the Norwegians didn't mention titles because what was most important to them was family members or clans.

Jan: And that was for me kind of revealing that this was not just an interesting theory that we were working with, but we could actually go back to the runestones as a written source and see that they were suggesting the same thing.

Nancy: Okay, that's two pieces of the puzzle. But what else could the researchers find that might support their hypothesis that Norway was more violent, and Denmark less so because Denmark had a stronger social organization?

Nancy: The answer turned out to be... DIRT.

Or more precisely, structures built from dirt and stone. Not buildings in themselves, but the things that the Vikings constructed as burial mounds or for other purposes.

These last were perhaps most indicative of how strong the structure of a society was, because if you want to build something really big, you needed to get lots of people to do the work.

And it wasn't easy work, as any Norwegian farmer will tell you now. The last ice age scoured lots of topsoil from Scandinavia and deposited it much farther south. What was left was poor soil with lots of stones.

Nevertheless, burial mounds were really a big thing in Norway. The Norwegian State i administrative databases for protected monuments reports more than 40,000 mounds, although only about 1000 have been dated.

Jan: Building all these burial mounds was a big task. It required a lot of labor. You could say that in Norway, really a substantial amount of labor was put into building memorials for families, from persons from many different layers of society.

Nancy: A lot of the Norwegian mounds that were dated were from the Viking age and the Late Iron Age. However, when Jan looked at the

trends over this period for the big mounds, more than 40 meters in diameter, he found that their size *decreased* over the period.

Jan: (17:15) So I just wondered what did they do in Denmark, were there any places where they were putting in a lot of labor? And the good thing about mounds and earthworks is that they're very resilient. So very many are preserved even today, or we can find traces of them. So it was possible to make a comparison because they would not just have disappeared.

Jan: So I looked for mounds, and I looked for other structures of Earth in Denmark. And that was of course the mounds and ditches, the fortifications. And, interestingly enough, it turned out that you did not have much of that in Norway, almost nothing, which is kind of understandable because, the people are living so far apart and there is not such a big population, and so on. But in Denmark you have quite a lot of them with a higher population, but also with a, perhaps, more prominent threat, from the outside.

Nancy: While there are many examples of these kinds of earthworks, one of the most striking is a massive structure built by the Danes, the Dannevirke. This was a line of fortification crossing the Schleswig (Schles- vig) isthmus, which separates the Jutland Peninsula in Denmark from the rest of the European mainland. The idea, of course, was to keep armies from the south out of what is now Denmark. It was built over many centuries with many building phases, but at least one phase during Viking times involved moving roughly 450,000 cubic meters of dirt. That’s enough to fill 36,000 dump trucks!

Jan: Most mounds in Norway, burial mounds, they are focused on the individual and the family. So very often you have farms, you have mounds that are on the farms where the family lived and that are kind of the ancestor mounds that gives you the right to hold on to this land according to medieval Norwegian legislation. So it's something about the family or the clan, or whatever you want to call it. In Denmark it's on a completely different level. You do not invest in these individual

monuments, but you invest in communal infrastructure that provided safety.

Nancy: This is one of the proxies that David was talking about earlier. It takes centralized power to get people to build these massive earthworks.

David: When you have these immense structures, like this enormous ramparts and wall between Germany and Denmark, large fortifications, et cetera, you need significant command and control. You need the ability to control a lot of labor, which in a regular clan system would not be there.

Nancy: OK, let's take a step back and recap:

We have evidence of very different levels of violence in skeletons from the two areas.

We have runestones from Denmark with people's titles, whereas runestones from Norway just reference family relationships.

We have construction of different kinds of earth structures in the two areas, with Denmark far ahead of Norway in terms of large earthworks that would require coordinated labor.

But there was one other piece of the puzzle that could provide evidence of violence. It relates to the question that Jan Bill was initially mulling over, back when he first met David Jacobson.

(Fade out at end…) Jan: So we have a man apparently dead in battle and we have this magnificent grave, which highly indicates that he was on very top level society, a king or something like that. I was interested in what kind of situation would have brought about this ship burial.

Nancy: Grave goods! Many of these skeletons were found buried with personal belongings from their lives. Could the researchers find differences between graves in Norway and Denmark?

Jan: We are looking for the intensity of violence in the presence of weapons in the two societies. This is of course not… a direct expression of violence, but we know from the modern period, for example, that there is a very close co-variation between the amount of handguns that you have in society and the amount of murders that you find in the same society. And you could kind of say that the Viking sword is the handgun of the Viking age, because you couldn't really use it for anything else than killing other people, or threatening to kill them.

Nancy: Here's what they found.

Jan: We saw that in both places, both regions, there were burials with weapons, but the proportions were very different. While in Norway, it's a very, very common thing that males have weapons in the burials, in Denmark, only a small part of the burials where you would have weapons.

Nancy: One factor that plays into this striking difference is the availability of iron. Jan says Norway had much more iron available as a raw material than Denmark, so it was easier to make swords to begin with. Nevertheless, there were still a LOT more weapons in Norway.

Jan: I was surprised to see how extreme they were. ..Looking at Norway and, and Denmark, you have reason to believe that there were about 50 times as many weapons available among the Norwegians if measured per capita, so to speak, compared to Denmark.

Nancy: there was another interesting clue about these weapons in the two areas.

David: In the burial graves, weapons, particularly swords, tended to be more closely correlated, not a hundred per cent, but correlated with skeletons that had skeletal trauma, suggesting that the swords and other weapons represented a warrior. It was quite extraordinary.

Nancy: *When we first started our chat*, Lisa told me how she had been studying the Viking remains for other aspects of her PhD dissertation.

She also contributed in the background to the team behind this sensational article that was published in Nature magazine in 2020. That article, based on DNA analysis, that showed that Vikings were much more heterogeneous than was previously believed. Some “Vikings” actually weren’t even Scandinavian.

And for a paper that was part of her dissertation, she also found isotopic evidence that Norwegian Vikings travelled all over the place, with northern Vikings even heading far to the south to the European continent. The point in all of this is that Viking societies are far more complex than we previously have understood.
And of course here, that Vikings in what we now call Norway were far more violent than those in what we now call Denmark.

Even though they were different, David told me, their societies were shaped by violence in different ways that remain universal over the ages.

David: So in the Viking age context, and these different proxies, everything is marked by violence. We are talking about graves, we are talking about swords. We are talking about skeletal trauma. We are talking about fortresses, defensive walls, or ramparts, et cetera, are marked by violence. The material culture that's left over is marked by violence. There are two things that one can take out of that. There was a lot of violence, or people feared it.

David: But I think there's a more profound dimension to it, that every society through time has to grapple with the issue of violence and a sense of security.

Nancy: I’m Nancy Bazilchuk, and you’ve been listening to 63 Degrees North, an original podcast from NTNU, the Norwegian University of Science and Technology. My guests on today’s show were Lisa Strand, Jan Bill and David Jacobson.

If you want to read more about the research that we’ve discussed in this episode, check out the show notes!

And if you've enjoyed today's episode, feel free to leave us a review, and even better, tell your friends.

Interviews, writing, editing and sound design by me, Nancy Bazilchuk. Thanks for listening.