

## Flake it 'til you make it

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### Publishing Date

2023-02-03

### Guests

Morten Kutschera (NO) and Javier Baena Preysler (ES)

### Introduction

In this February episode of Finally Friday we're talking all about flint! This material is one of the most commonly found throughout prehistory, and so this month Matilda chatted about flint and flint-knapping with two experts from our EXARC community, Morten Kutschera and Prof. Javier Baena Preysler. What are the implications of different ways to learn and teach flint-knapping? How much do flint tools change throughout human history, and why? Can you knap flint with a pen? To find out the answers to these questions and more, make sure to tune in to this month's episode! Morten Kutschera is an experimental archaeologist with experience in many different kinds of technology, although he is particularly well known for his flint knapping expertise. Professor Javier Baena Preysler is professor of prehistory and archaeology at the Universidad Autónoma de Madrid, and director of the university's laboratory of experimental archaeology.

### Transcript

It's the first Friday of the month, which means that it's time for the next episode of #FinallyFriday, bringing you insights and discussions from around the world focussing on experimental archaeology, ancient technology, archaeological open-air museums and interpretation.

**Matilda:** Hello and welcome to #FinallyFriday. My name is Matilda Siebrecht, and today I am joined by two specialists from our EXARC community focussed on flint knapping. Morten Kutschera is an experimental archaeologist with experience in many different kinds of technology, although he's particularly well known for his flint knapping expertise. He's currently working as a county

archaeologist in Agder, Norway, where his responsibilities range between field work, public archaeology and basically everything relating to the Stone Age. Professor Javier Baena Preysler is a professor of Prehistory and Archaeology at the Universidad Autónoma de Madrid and Director of the University's Laboratory of Experimental Archaeology. Although his research covers many different topics, he is especially esteemed for his flint knapping knowledge and expertise and is one of the leaders in experimental archaeological research in Spain.

So welcome to both of you, thank you for joining me today. I have a very quick question to start you off. Both of you are, as I mentioned, extremely experienced flint knappers but perhaps you could take us back to how it all started. What first got you interested in flint knapping? Maybe Morten, if you could go first?

**Morten:** Yeah, it was as an archaeology student. Back in the days there were very few archaeologists. Even like first year students, we got paid field work and I was lucky to join a Stone Age Excavation. I didn't know much about the Stone Age. I was actually there to study the Middle Ages. But then I met this Canadian archaeologist who was totally, really into, not just flint knapping, but refitting and stone technology in general. He was a great inspiration for me and he managed to draw me into his crazy world of refitting and technology and eventually, I got really hooked. And then there was a poster at the university, where some Danish archaeologist would be giving flint knapping lessons. This was long before the internet and stuff like that. So we call this guy in Denmark and both me and David Simpson, who was the guy who inspired me, we went with some colleagues to Denmark, we learned the very basics and, well, went back and applied our skills. So that was the beginning for me.

**Matilda:** I seem to remember, were you a little earlier, Javier?

**Javier:** I really don't know exactly when I became interested in flint knapping, but, I think I was just eight or nine years old or something, similar to this age, because I have some books from my aunt that she dedicated to me, about history in 1969 or something like that. I don't know why I came into the flint knapping, probably I saw a video or something similar at the tv. I just get interested in the ancient things and, in the beginning, I started knapping with a pen in my room. I just find some flint because in Madrid where I live, we have a lot of flint there. I just start trying to knap with a pen in my room and probably because I'm a very geeky person. I was a very strange person in relation to the past things. I was quite interested in fossils and these kind of things, so I started knapping perhaps by casuality. Not at the university, of course.

**Matilda:** Did you also learn from someone like Morten mentioned David, I think he said. Was there someone in your life who kind of taught you how to do it without a pen?

**Javier:** Yeah, but later on. I just start knapping when I was about 30 years old, something like that, with Eric Callahan and also with Eric Böeda, but at the beginning I just have a kind of feedback from two professors at the university, when I started studying my career there, that I just present some of my pen knapping tools to them. One was Concha Blasco and the other one was Charo Lucas Pellicer. They were professors of prehistory at our Department and they just gave me wonderful feedback. 'Ah, you're doing pretty well, continue knapping!'. Because they were not knappers of course, but they have some experience in the past with François Bordes. So they recognized the importance of knapping in prehistoric studies. Later on I had help or support from different people.

**Matilda:** That seems that then you had quite different approaches to how you learned it, because for Javier it was maybe more just playing around with the practical side, whereas Morten was sort of taught the techniques maybe earlier - I don't know if you would both agree with me in that Morten,

do you have some input?

**Morten:** Yes, I learned some very basic techniques, though, mostly relating to the Mesolithic. Some simple blade technology and making flake axes. So more or less just direct and indirect knapping. Very simple stuff. But I brought it back with me, in my hands and my head and had a look at the archaeological material from different sites. And then of course, I could recognize the features and I applied this knowledge back and forth between the material and my own flint knapping. I wouldn't say that I learned too much, but I learned at least the principles of flint knapping in a way. And I could apply it to other techniques and trying to read the material... But there wasn't too much to learn from anybody, I guess. Especially in Norway, where you don't have a lot of flint, it was very difficult to just start flint knapping or flint knapping on a high level. So it wasn't something I did a lot. It could be months or even a couple of years between each session in the beginning, and then for some reason I got more connected to Denmark and started really taking it to another level. I think it was in '93 or something.

**Matilda:** Javier, do you have anything to add to that from your own experience?

**Javier:** In my case, I was absolutely alone because when I started knapping in Madrid, there were nobody here. We have the French connection. Of course in France there were a lot of knappers, Tixier, François Bordes and some others. Böeda, Pelegrin, et cetera. But in Spain, we don't have any help in this sense. But I just passed a lot of time, just trying to knap with some pebbles and my pen in my room, without learning anything. Perhaps some technical skills, but nothing in relation to methods of knapping. But at the same time, thanks to this long period of my personal lifetime in which I could have a kind of skill in terms of mechanics about knapping, because I was even able to knap with my eyes blind. This is just because we make some proof about that because I spent a lot of time knapping in the same way. So it was amazing, because from the moment I just stay in touch with the archaeological material and have some help in terms of recognitions of methods and modalities in the materials, I discovered a new world in relation to flint knapping, because I have the second step in the learning that was everything you have learned, now you have to apply in terms of following particular roots that you can see in the material, in the archaeological stuff. So I do not consider a wasted time, this first period of my life.

**Matilda:** Sort of going on from that, do you feel that then the theory or the methods or the understanding of the different styles over time in prehistory, et cetera, learning about that or learning the practical skills, the motor skills, having that kind of muscle memory..., would you say one or the other is more important when you're learning flint knapping for the first time? Because you both came from slightly different sides, I guess, in this, and there are those two components, would you say, of learning flint knapping? Would you give one more importance than the other or are they about equal?

**Morten:** I think those two things are inseparable. You have to develop some sort of technical skills and the motor skills or the mechanics of it. It's something that you learn from breaking a lot of rocks, as they say. I learned both of them at the same time. I think that I actually had some advantage of knowing the different technologies and having some insight. I worked as a field archaeologist a lot at the time and cataloguing a lot of Stone Age material. So basically I started trying to make the things that I saw in the archaeological material and I think I benefited from that, from really understanding and trying to understand what I had in my hands and to figure out how each and every individual thing was made, the different types of blades, microburin technique, how to make a tanged point, simple things. I think it would've been a lot harder for me to understand the techniques if I didn't have the archaeological material as a reference or the theoretical knowledge. But it wasn't really theoretical knowledge in that sense. It was more that I had access to the archaeological

material. I worked on excavations and because I had an interest in the technology, the flint knapping, I was allowed to do a lot of the cataloguing of the finds, and we had some really big, archaeological excavations, some big projects going, and there were thousands and thousands of flakes and tools that needed to be catalogued. Kind of became my expertise in a way and I think that the flint knapping and this back and forth between the archaeological material was the reason why I've got..., well, excelled in this.

**Matilda:** Would you agree with that, Javier, in terms of them being inseparable?

**Javier:** Absolutely. I recognize that there is a common sense in all the knappers that both things are quite difficult to be separated. But as a teacher who has to teach flint knapping, I try to separate them when I have my classes, just because when you start trying to teach people who doesn't have any previous knowledge of flint knapping about the mistakes and the problems and limitations, they have to realise that there is a big limitation in the case of knapping about the accuracy of all the mechanical gestures that you apply, because many of them, even if you explain clearly what is the sequence of a discoid production, for example, and we have a lot of Middle and Lower Paleolithic materials in central Spain, if they do not have the ability to have a specific trajectory of flint knapping gestures, it is quite difficult to have a very simple way of developing a method, like discoid. I would not talk about Levallois for example, that from my point of view, is one of the most complicated sequences that you can produce. Perhaps making an axe or a Danish dagger or something like that could be more difficult, but we don't have these materials in Spain. So from a teaching perspective, it's quite important to have a clear difference between what are the mechanical aspects and which are the aspects related with the methods and the sequence in which you have to have a different approach in terms of teaching. We normally have two examples when we explain flint knapping to the students. One is driving a car. You can know all the things in relation to how to start a car and how to press the brakes and all these mechanical things. And another thing is going to the supermarket from your home to buy something. So you have to respect many signals, many different actions of driving that include what we can compare with the method in lithics. The second one is a cooking recipe, is quite similar. You can move the spoon, but another thing is to follow a recipe when you cook. Even if they are clearly mixed, in terms of teaching, it's quite important to have a clear difference between them, in order to correct students when they produce mistakes or they have some limitations.

**Matilda:** Do you have a similar experience when teaching, Morten?

**Morten:** Yes. I teach different groups and with my perspective it's easier, I think, to teach archaeology students in a way, and experienced archaeologists. And most of the people I teach, they're not really planning to become flint knappers. They're mostly interested in understanding more about the technology to see how the bulb of percussion develops the flake attributes, like the technological features, so it's easier to understand them when you start looking at cause and effect, how the different techniques and the different impactors will affect the flint. My favourite thing to do is to work with this group that already knows the material, at least on some level. I do also teach groups from different environments, people who don't have an archaeology background, people who are into bushcraft and survival and these things. Then you have to teach from a very different perspective and point of view, you need to teach them very simple ways of making efficient tools. But I always end up doing the Mesolithic thing with these people, because they've seen these American flint knappers making very advanced things. And for me, flint knapping is about, or at least from a survival point of view, to make simple tools in a matter of seconds. So it's kind of the same things, but it's easier to get my point across with an archaeologist or a student who already knows a little bit about lithic material, from books or lectures or whatever background they have.

**Matilda:** So how do those sort of more modern ways of teaching, for example, flint knapping affect how we understand prehistoric flint knapping technology? Does it affect it? Is it possible to remove yourselves from that kind of modern way of learning the technology? I was curious on your thoughts on that. So maybe Javier, if you want to go first?

**Javier:** I'm not sure to have good answer to this question because it's quite difficult to recognize... When we make an excavation of a Paleolithic site, for example, we just recover chips and flakes and cores and so on. But it's quite difficult to make a relation between different gestures or styles to these pieces. There have been many works that tried to come deeper into the analysis of individual and community styles in the materials. For example, on arrow points, it's possible to recognize tendencies or styles that can be shared across different individuals, but in the material it is quite difficult to find out. What I really appreciate is, when you see modern knappers, where they come from. What have been the school they follow. It is very clear when you study, for example, Middle Paleolithic materials, and you see someone today knapping in what I call Böeda's - Eric Böeda's - style, you immediately recognize that he or she has learned from this expert knapper because the way in which, for example, they make the platform preparations is very particular. It was exactly the same when you appreciate, for example, the case of perhaps the indirect percussion from Pelegrin in comparison with another very good knapper, that is Peter Wiking. They have completely different flint knapping gestures. But how we can get that into the archaeological material is very challenging because when we study archaeological materials, sometimes we are not very clear about if we are just paying attention to individual materials or collective materials. So from the moment we can collect individual information, probably we can just trace this influence in the past, but it is a very difficult question to be answered just in one way. I don't know what is the opinion of Morten.

**Morten:** Well, when it comes to the knapping debris in Norway, we have a very fortunate situation that a lot of the sites that we excavate each and every year, they're undisturbed. In the areas where you actually have all the flint, you have undisturbed sites where you don't have agricultural impact later, we can actually follow knapping sequences. We can see individuals in this material. So we can start to think about these questions, about learning. A lot of my colleagues looked into these things, but I don't know if they actually got it right because they can see how a core is almost..., the blades are detached perfectly until something happens and they assume that the core has been handed to a less experienced individual. Mistakes are made and it's been passed back and maybe corrected or something. They think that they can see the individual's or teaching experiences from it. But from flint knapping, I've started to realise a very different thing, from people who used to be around me for a long time. They were just observing, taking video recordings, photographing the way I worked. I had a good colleague and she was following me for a long time, taking a lot of photos and videos, and the thing is that she never wanted to really learn flint knapping, she wasn't interested. But then one day she just sat down and she took a core. She didn't want me to interfere in any way. She struck off 50 perfect blades with indirect percussion. Nobody taught her how to do it. She just observed how I did it and understood it from observing, and I think that's probably how children learn in these societies. Maybe there wasn't really a school of flint knapping where you learned in a few days or where you had this tutor who taught the students flint knapping, or maybe you had it in advanced societies like Denmark in the late Neolithic, for example. Maybe children were just playing around, observing, picking up the knowledge, and then sitting down, experimenting on their own, and then suddenly they just knew how to knap! It happened too many times to be a coincidence. I experienced this a lot of times, just children or people around, they just picked up the pieces after observing me for a day or more and then started experimenting on their own, and then they just did fine!

**Javier:** Of course our archaeological sites have a lot of alterations and they're disturbed by ploughing and many other processes. But we were lucky some years ago, two or three years ago, we had the opportunity to excavate a quarry site. It was a Lower Paleolithic quarry site, in which we can detect more than 300 hand axes there, in different stages of the production. And one of my colleagues is making her PhD about the learning processes that can be read from the material and one of the conclusions was that probably there were a small group of children at the same time where experts were making hand axes there, playing and just watching how the expert make these final pieces and they try to produce them with some preforms or just simply tries of this material. So of course just paying attention is a good way to learn. Playing is another good way to learn and of course with a teacher...!

**Matilda:** We sort of spoke about identifying individual knappers, but I'm also curious, there's so many different styles that you've both kind of mentioned vaguely in terms of over time, so how flint knapping develops over time. I'm just curious, whether those styles..., are they because of the different tool types required or are they the same tool types but different cultural influences, different regional influences, the use that you're putting them to in the end? What do you think creates that development? Why does flint knapping change so much over time, do you think? Does it change more than other technologies? What are your thoughts? Maybe, Javier?

**Javier:** Yeah. I think it's better I start because I used to work with Lower and Middle Paleolithic and then Morten probably has a similar or maybe a different point of view. We have periods of time in which technical and technological aspects didn't change so much. We even have a millennium of periods in which things are going more or less in the same way. Is the case of the Neanderthals that perhaps during the 70,000 years BP, till even 60,000 years BP, 50,000 years BP, they just start knapping in the same way in some particular areas of Europe. The case of the Quina facies described by Bordes. So they make the same for a long period of time without changing, but suddenly things change very fast, very quickly. In terms of evolution, you have this gradualist perspective. The other one is a step perspective. But in terms of culture, we have periods of very static evolution and some other in which the changes are very fast, probably because we are dealing with different movement of populations in which new styles, new cultural resources are just sharing in a very short period of time. Communication in the past has to be very, very efficient in terms of changing experiences. I personally still miss a new perspective about how we learn prehistory because we learn prehistory in a very typological way, particularly in the initial periods of our history. Probably what we need is a more technical and technological history, as in manuals and these kinds of things to see how techniques changed across time. Until now the typological approaches are still very, very strong. And of course in more recent periods, types are more clear than in the beginning. But probably Morten has some other ideas...

**Morten:** I totally agree with you on the need for a technology-based perspective. I think that the way people have been looking at typology..., there are some flaws with that and mastering the amount of retouch without understanding, for example, like why the retouch is supplied. Each piece is unique. So I think that it's very important to know the technology in order to approach a lithic material. I think that's really essential. So I totally agree that we need a bit of a change. Actually in Norway, we are working towards that change and especially at the university in Oslo they're pretty good at it. They kind of changed the focus a lot away from this typical typological studies towards understanding the technology. Let's see if I can remember exactly what the question was...

**Matilda:** A long time ago ... your thoughts on the development of different styles or techniques over time in prehistory.

**Morten:** Okay, so I will use examples from Norway because that's closest to my heart, of course. I've been working mostly with Norwegian material and of course we have a very limited prehistory in a sense. We don't have anything predating the later Paleolithic. So the first finds that we have they're between 11 and 12,000 years old. We don't have anything older than that. So we can more closely follow the traditions. What we can say from a technological point of view is that the first people to enter this wasteland after the Ice Age, they come from the south. We can see that clearly on the technology. It's the same as the Ahrensburgian culture and pretty much everything coming from the south, the replicas and the tanged points and all these things. And then we start seeing other influences. A thousand years later, we get a Mesolithic element coming in from the northeast more clearly. And from the same place we get the micro blade technology, doesn't come from the south, it comes from the Northeast, and it even spreads to Denmark. We are Norway and Sweden, so it's kind of like the other way around, not the way people expect. These more elegant technologies, they're developed probably because of necessity, because in these regions as well as in Norway, you don't have a lot of raw material. You have to be careful with the raw material. The first techniques to enter Norway from the south, they're wasteful technologies, direct percussion blades, you make flake axes out of flint, and you see how this changes when you get technologies that come in from areas where you have poorer lithic resources. They start to make axes from diabase and greenstone and similar materials, ground and pecked stone axes. And you get microblade technology, where you can actually start off where you would discard the blade core. They would actually start with a piece that size and take off maybe 50, 100, 200 microblades that can be applied in a different way. So you can follow these traditions and they kind of make sense. And also from the major influences that you have in Europe, when agriculture comes, you can see they influence the same technology of course. It kind of relates to the North European situation in general, you get most of these technologies that you see in Denmark and Sweden as well, to a more or lesser degree. The agriculture doesn't have this big impact in Norway. With the Funnelbeaker culture you just have small pockets where you have this technology. But yes, you can follow the influences and it's probably both due to contact and immigration and other things. People carry new technologies when they come in contact, they will either take over or inspire other people for different reasons to pick up the new technologies. How these things spread is not always good to say, but maybe with the new genetic research where you have grave material where you can take DNA samples, you can probably connect, to a certain degree, these things to real life populations. But it's also a dangerous thing to do...

**Matilda:** So it seems that indeed, from what you're both saying, that it's sort of a mixture of external influences, but also just changes in technique over time as well. Sort of relating a bit as well to what you were both saying about the fact that we maybe shouldn't just look at typologies, but should understand the techniques more. Would you say that it is essential for anyone who wants to study flint technology to have their own experience of flint knapping or to have that practical understanding of flint knapping?

**Morten:** That would be a great advantage, yes.

**Javier:** I agree, absolutely. I have the experience with some people that were not really active knappers, but stay behind good knappers, is the case of Iluminada Ortega. She was always together because she was a couple with Laurence Bourguignon and she didn't knap, but she stayed all the time around one of the best knappers of Middle Paleolithic technologies, and she was really, really clever in the recognition of the material and the lithic categories that are related with particular knapping methods. So it is not absolutely necessary, but is a big advantage if you have the opportunity to knap, because you have not only the personal experience of the sound, of the touch, the feeling of the flint, of the tools, of the hammer stones, some other personal or sensitive aspects,

but also the opportunity to have your experience of the fails, of the mistakes or the success, gestures or actions that can be somehow compared with the archaeological stuff. And I think that's a big advantage. Yeah.

**Morten:** And there's also another thing. It's not just the knapping but it's also this thing that, when you start using the tools, it also gives a bit of a perspective that you lose if you never try to use the tools. If you use a burin, you can see which ones are flawed. When you start making and using the tools, the combination of the two, you understand the lithics and the material in a much better way. So it's not just the production, but it's also understanding through using the tools.

**Javier:** Exactly, I absolutely agree with you, Morten. It is a global perspective of what is related with, in general, the production, the activity, economical activity of the group. Is quite important to have this experience.

**Matilda:** Good to know that experimental archaeology is still essential then in this field. We spoke a lot at the beginning about your own experiences in experimental archaeology, and you're both very experienced, you're very well known experimental archaeologists, especially in flint knapping. But how has that field of experimental archaeology developed since you started? Would you say it's easier for people to get into now? What are your thoughts on that? Perhaps Javier, you can go first?

**Javier:** Yeah, I talked to you about my beginning with the flint knapping without anything around me. So of course the things have changed completely. Now it's so easy to have different approaches to flint knapping. I would say that this is like the Star Wars series, because you can be in the dark side of flint knapping, and you can be in the better side of flint knapping. Yeah, I mean that if your purpose of knapping is just to produce nice tools, it's okay, I don't care about that, but try not to include the term archaeology, experimental archaeology. You're simply making reproductions. That could be a very complicated area. If you knap outside and you live in the country, all the chips and all the flakes, you are not doing well. You must be careful about these kind of things. From my point of view, things have changed a lot. Absolutely, you can just connect through YouTube with people who can make marvellous arrow points and see how they just prepare the tools, but perhaps they are working with different modern materials into these reproductions. And it is just simply a hobby. It's not experimental archaeology. So we must be careful because things have changed a lot, but not always in the right way.

**Matilda:** Would you agree, Morten?

**Morten:** Yes. to a certain degree. When I started flint knapping and working with experimental archaeology, we were probably three or four, sitting in an attic or a basement in the university in Bergen, making and using tools. And for quite some time, almost a decade, I was probably the only flint knapper, serious flint knapper in Norway. And I felt really alone. And then I started, of course, discovering that there was a whole world out there with people like me sitting on their own, doing their own little experiments and working in a serious way, like Javier says. And then of course, suddenly there's just an avalanche and internet is connecting us to this American environment where you have sometimes brilliant knappers and it's a huge hobby with thousands of people, big knappings where people meet and they use their brass or copper tools to make the most incredible things, but it's not reproduction always. And it's also very far from experimental archaeology. These people, they're not really interested in that. They come from a point of view sometimes from the arrowhead collectors. They've been growing up picking up arrowheads from the Native Americans and they want to learn how to make these beautiful things and they make frames and they put them up on the wall and it has to be colourful and just plain flint is not good enough. I don't know, it's a very different perspective. I can understand this. Sometimes I get some of this raw material and I

just love working with it. It's like knapping candy. It's so soft and smooth and easy to work with and sometimes you get carried away. In the end for me, flint knapping is about making useful tools and weapons in raw flint that makes sharp and durable edges. It's important that we try to understand the prehistoric flint knapping and technology and I don't like to stray too much outside of that.

**Javier:** Because I spent some years in the United States and I have contact with many knappers - in the way that Morton has described, and they were really nice people - I would not say that they are doing wrong because it's a different context, but I personally appreciate that if you are knapping, you can have different purposes of your activity. If you just simply want to spend the weekend just trying to produce the best and the nicest piece in the world, or just simply you want to answer questions about the past, the human past. I personally really appreciate knapping provides me some clues about how to answer questions coming from the past. Of course, they are really expert in some aspect. But yeah, I agree with Morten, most of them came from these collectors of arrow points and want just to know how they were produced.

**Matilda:** Yeah, I think that's a really good point to make, the difference between experimental archaeology and just having fun with replication, basically. They are indeed different things. I think we'll wrap up now. I do have one final question. Do you have any exciting plans for the future with flint knapping? And also, do you have a final message that you want to make clear to the EXARC community in relation to flint knapping? Perhaps, Javier, you can go first?

**Javier:** Plans? Well, one of my biggest challenges now is, I have still many working years, but I'm planning to do the right things in order to have continuity in the experimental lab. Now is one of the things that is more challenging for me because I just spent most of my life trying to establish an experimental lab at the university and it's quite difficult to find someone that can continue this work and to maintain the lab because even if you have a lot of facilities coming from the administration of the university, it is quite important to have someone that produce movement in the way of the lab. So this is my most important thing for the next five, ten years. But at the same time, we have workshops and I'm very interested in trying to improve the connection between Central Europe and of course Northern Europe, with the southern part of Europe because I think we have a lot of asymmetries in terms of communications, transfer of information, even activity. In the United States you have these knappings in which hundreds of people just mix together, coming from different states of America and they just share a lot of information. But we still in Europe miss these aspects. So this is another challenging aspect for me. And advice, just be very serious in the work they can start if they want to become knappers. I just recommend them to have questions all the time, archaeological questions, I mean.

**Matilda:** Thank you, Morten?

**Morten:** I also struggle a little bit with the same thing that I'm getting older and I'm also worried about passing on my knowledge to enough people. Luckily of course, I have a few good colleagues here. We're a big archaeological staff in Agder where I work, but, since I kind of went back to mainstream archaeology, to regular excavations, so going back to my roots, sort of straying away from experimental archaeology, at least as a way of making a living, I feel that I'm not able to teach as much as I would have liked to. I'm not able to follow up students all over Norway or any part of Europe. So I'm a little worried about that. I quite enjoyed that part, where I could teach and I could see that my students were excelling and I felt that I was passing on the skill, or at least the knowledge of flint knapping. I'm not sure that I can actually say that I do that to the degree that I would've liked to. But on the other hand, being in this position where I am now, I sort of get to do applied experimental archaeology. Because of the drought and some maintenance work on hydroelectric power plants we have a lot of inland lakes, where the water level has been lowered for

different reasons. We've been able to investigate these lakes and the lake shores. When you walk on the original lake shores, we find enormous amounts of, not just Stone Age tools, but Stone Age sites from different time periods, pretty much all time periods of Stone Age and prehistory. The only thing we can date these after is if we can find something that is typologically or technologically relevant. So we're going to make a big project focussing on the technology where we will try to replicate the technologies without looking at the material and see if we come to somewhat the same kind of waste material or the same blade attributes and stuff and compare, where we have different knappers, blind tests and other things so we can be more sure that we actually can start dating these finds based on technology, because that's primarily what we have, we don't have a lot of arrowheads. That's probably one of my bigger projects in the near future.

**Matilda:** That sounds very exciting. Well, it sounds indeed like any young and upcoming flint knappers who are listening in..., there're potential shoes to fill in the future. So don't hesitate to continue practising and continue experimental archaeology. It sounds like there's a lot to do and labs to take over, projects to do... Keep going with your flint knapping practice! Thank you very, very much, Javier and Morten, for joining me today and sharing in your experience and your expertise, I definitely learned a lot. Hopefully our listeners did as well. So thank you very much to both of you.

**Javier:** Thank you, Matilda, and thank you Morten. It was nice to share this time with you.

**Morten:** Yeah, it was really great, thank you both.

**Matilda:** And thank you to everyone else for listening in to this episode of #FinallyFriday by EXARC. If you would like to become more involved with EXARC, after all, we have all these really cool technologies we do, like flint knapping, you can become a member. Alternatively, you can also make a small PayPal donation through the website to help support EXARC and its members in all of our endeavors.

Join us next month for another episode of #FinallyFriday and learn more all about the world of experimental archaeology, ancient technology, archaeological open-air museums and interpretation. Don't forget to follow the show through [exarc.net](http://exarc.net) and our associated social media channels. See you soon!