EAC12 Q&A Session 9

2021 March: 12th Experimental Archaeology Conference #EAC12, World Tour

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Hi, everyone. Welcome to the live Q&A session for Session 9 on day 3 of the International Online EXARC Conference. So welcome, first of all, all the speakers. Thank you so much for a range of really interesting talks. We have so many questions from people already.

We will start with Tammy: **You mentioned that ochre is used to tan hides. Could you briefly explain where, when and how?**
So in terms of the Middle Stone Age archaeology, we don't actually have evidence of the hides they have preserved, but we have evidence of how the ochre was used and that it looks like, from experimental use of ochre pieces, modern experimental use of it, rubbing it against even human skin or hide or hair, it gets kind of rubbed - you know, a lot of ochre is quite hard. Some of it is really soft, but you get a really nice shine or polish or micro striations that form on the top of the pieces. And so from that it's quite tricky to know whether maybe people were just handling the ochre and you get it from, from just handling it, but you also get it from, it's likely that it would have been something a little bit more forceful; that they're rubbing it quite hard against tide. And the iron oxide in the ochre actually helps stop the decay process. So it can actually help preserve hides and make a really nice hide. Just the process of either putting ochre powder on it. But perhaps in the past, they were rubbing ochre pieces directly to kind of a dual purpose of scraping the hide at the same time to remove some fat, but putting ochre to preserve it.

Okay. **And is this something that still continues in the present day as well?** (Tammy)
Yes. So there's been cases in various communities and cultures around Africa that they still use ochre as a good hide thing to stop the decay process; kind of a preservative. I mean, there's other methods now that work a little bit better, but it seems like also some experiments that were done by Riaan Rifkin, he found that the red ochres often will have a higher iron oxide content. They will actually stop the decay process better than the yellow ochres. And so it might be some reason that red ochres generally in ethnographic cultures and modern cultures and in the past, it seems that red ochres were just preferably used and we just preferred for some reason. And it might've been the iron and it might've been the colour.

Cool! As someone with red hair I can definitely understand that! Thank you very much. Our next question is for Victoria: **In what position did you put the bone flakes in the sediments? Flat, distal side up, etc.?**
So I kind of just placed them in. I put them around in the whole, there's a 50x50 centimeter block that I made and some of them were distal side up, some of them were flat, some of them were, it was kind of just randomly placed.

Thank you. And we have another question here for you (Victoria). **Are you planning to do more research and if so, will you use a higher resolution microscope next time?** So, yes, I'm actually busy doing some more research currently. And I'm using the information that I found in this paper to study some bones from Klasies river in South Africa and we're trying to get access to a really high resolution microscope. It just depends on all the COVID rules and everything currently.

Did you, by the way, already published the results of this? (Victoria**)**
It's not published in anything as of yet. I'm hoping to maybe get it. Because it's an honors research paper, so I'm not sure who's looking for something like this. I'm speaking to my supervisor to try and get it published.

Okay. Well, it sounds like someone at least is interested in finding out more cause they asked what the name of the paper was. So definitely hopefully if anyone's interested, I'm sure they can contact Victoria for more information. Thanks Victoria.

Our next question is for Fergus: **The variable you didn't mention was thickness of roofing materials. It is often said that buildings are thatched to modern standards, which are thick and make it difficult for smoke to penetrate. Thus making the interiors very smoky and in houses open to the public, creating a considerable health issue. It also impacts the amount of material used, weight of the roof and cost. Is this something you might add to your project at a later date or are you happy that over the years of building at Butser, you've already found the perfect thickness?**
I certainly wouldn't be so bold as to claim that we've found the perfect thickness, but we do find a fairly thin coating works best because it does let the smoke percolate out. In modern thatching, it's quite common to leave the previous coat on there. Sometimes there's an undercoat and thatch on top and we certainly don't tend to do that. So yes, I think we've found something we're reasonably happy with - a fairly thin coating that holds together, but does allow the smoke to escape. So I didn't mention that, but yes, that is a very important factor.

Okay, thank you. I'm not sure if you're also the person to ask about this, it's aimed at Trevor as well, so maybe you can both answer: Absolutely fantastic projects. **In terms of earth walls, will you use different techniques on different parts of the wall or for each wall panel between posts to find out which would work best? The speaker is thinking about earth and cob bricks, raw, for example, that seemed to have been discovered in Early Iron Age context in Northern France and that they never used or presented anywhere. And they also add, I simply can't wait to see how your project evolves. Thank you for sharing.**
Thanks for the question. It's really good. And it's actually a point of discussion. At the moment we're thinking of doing a cob wall. So a sort of rammed earth wall, in which we'll just use a soil which will be bound with probably some sort of organic material like grass. And I have been wondering whether we should do different sections of the wall in slightly different materials. One of the limitations we have is that the soil that we're on is very thin, it's probably a sort of a glacier loess soil so it doesn't lend itself to a lot of uses. So I think that this sort of compacting technique is probably the one we'll go for, but great question. And we are discussing whether we might do some subtle variations on that.

Okay. Thank you very much. I have a question for Basma here: **Have you done, or are you planning to do use-wear comparisons between the experimental and the archaeological amphorae?**
Yes. I intend to do that in [...] because in my research I started a comparison between the style of amphorae which was made in Rome, old Roman province and how the Egyptians tried to do the same shape of the amphorae.

Actually, I'm not sure if you mentioned this in your talk. I'm sorry, if you did. **Are there similar shapes and similar styles being used today as well that you also consider in terms of analogies?** (Basma)
Here in Egypt, we still use the same shapes of..., not like it looks like amphorae, but we still use the pottery storage, big storage and use it to store and transport a lot of goods.

Okay. That's really interesting. **So I imagine you had a lot of feedback as well from locals who were watching the experiment taking place?** (Basma)
Yeah, sure. Yeah.

Okay. Thank you very much Basma. We have the question here for Linda: **Quite a lot of your students seem to have started outside the realms of archaeology and entered the master's program after being experienced in the more practical side of a technology. Do you therefore also encourage people with no archaeological background to apply for the master's?**
Yes, I do actually, because archaeology is one of those things where almost every subject you can imagine, said A Level in the British system, would feed into it. It's about things. It's about people. It's about practice. It's about art. It's science. There's a little bit of everything in there. So whatever your background is, you'll probably have an advantage somewhere in that field. And they'll also be a large area where you don't know so much. And it's really just a question of filling in the gaps and working with kind of a scaffolding really of what you know already and branching out into the things that you know less well. So yes, I do think it actually suits people who want to translate what they have been doing into something that is more archaeological in its focus.

Great. Thank you very much. So, good news for all of you crafters and more practically oriented people who are listening, you can definitely continue in archaeology. We have a question for James: **Fascinating talk. Did the Greeks use sand casting?**
So they used sand casting in the early Archaic if I remember right, but for any sort of large-scale sculptures, they were using lost wax casting. I was using sand casting as part of my research because it was taking away, doing lost wax casting, it's a whole other dimension of work that goes into it. And I wanted to [...] the materials themselves rather than the whole process of casting.

Okay. Thank you very much. So that was a very simple but effective answer. We have a question for Chrissie: It is your time to shine Chrissie. **I would love to hear Chrissie expand on the work that she initially did at Sibudu and then later at Border Cave on bedding. What made you think it was bedding in the first place?**
Hi everyone. Chrissie speaking. Why we actually thought it was bedding was because, well, it started simply because we'd found a lot of sedge seeds or nutlets, and we tried to work out where the sedge nutlets came from and while doing that, we worked out that they must've come in on some kind of sedge culms or stems. And after sort of developing that idea, we also then looked at the micro morphology and discovered that there were stems in the endleaves in the sediments. And so that's how we got to the bedding idea. That was at Sibudu where the bedding, there was no desiccated bedding, it was all either solidified or carbonized. And then when we got to Border cave, it was very obvious because the bedding was desiccated and quite easy to see. Does that answer the question?

Thank you, Chrissie. Thank you very much.

Okay. We have a question for Claire: **Do you think that recycling of building materials might've continued from earlier periods where communities were more nomadic and therefore might've carried a lot with them: tents, etc. Is there archaeological evidence for this during the Mesolithic or Neolithic transition?**
It's a good question. And one can only really speculate. So obviously we know that there is very little in the way of archaeological evidence for Mesolithic settlements. I mean, I know that of Star Carr in the North of England, they have some evidence of stake holes, which would suggest structures. And our experience, with this building at least, is that the previous building that occupied the same

position had materials within it, which are, so it was about five and a half years old by the time we deconstructed it, that the materials inside, despite the fact that the thatch in that building in particular was extremely thin and of quite a low pitch, but it had survived remarkably well. So I would be amazed to think that people didn't reuse any available resources because however effective a neolithic tool or axe might be in collecting new materials or chopping wood to create a new building, it's going to save you a lot of labour to reuse material. And some wood survives, for example ash, survives remarkably well. It becomes more brittle, but as long as you don't want to bend it, it was completely reusable and it has been absorbed into the new building. So I think it's a sensible conclusion that this might have been a continuation of Mesolithic more hunter-gatherer type movements around the landscape that you would have continued to carry stuff with you. And that would translate into building more permanent buildings and recycling and reuse of any material that was still usable.

Okay. Thanks. **Actually, in the converse of that, was there any material that you saw that definitely wasn't reusable? I'm just imagining that the wood that would have been in the ground might not have been as good, but maybe, I'm not so sure myself about this?** (Claire)
Yeah, so we tend to find that oak survives the longest in earthfast structures and the ash doesn't last so well, but as long as the ash is not in the ground, it's a really good material to use. And obviously in the past it would have been readily available. So you're absolutely right, the wood in the ground will rot away quite quickly, regardless of whether you char the timbers or not, it will still decay. So I guess you can reuse buildings in the sense that you can take the bottom off the timbers and reduce the length of the timber and reuse it. And we have actually, we've done that here. We've seen it in archaeological evidence as well, that it looks like people are probably reusing and shortening the timbers and the building just reduces in height over time. I think I've read ethnographic sources, which would suggest that as well, that the building just becomes lower and lower until it's not really an occupiable space. And then you start again.

Thank you for that. We have another question for Tammy: **Do you see any patterns in tool preference from your participants in the workshop when painting with ochre, so sticks versus fingers, etc.?**
It kind of depends. I think it starts out that people go, okay, with painting you need a paintbrush. So they'll stick to the paintbrush. And then I have to remind them that you can use the sticks. And we often get really nice responses that they go, wow we can make a really fine line and other little details. Put the paint on the page and then engrave into the wet paint with the stick. And then it's usually only later that people will be a bit more keen to get their fingers dirty and use their hands. And then kids usually go completely over the top and start painting their faces and their legs, and kind of, it takes a little bit of time for them to get into it. And every now and then you'll get some people that are really keen to experiment a little bit more and they'll try anything that they can find or pick up a stone tool and try paint with that. But generally, and maybe it's how I structure it - that you think of it as a kind of a painting workshop so you think 'paintbrush' but maybe if I suggested fingers first, maybe that's what they would try first.

Would you ever consider doing more kind of in-site workshops, shall we say, so outside, and then you just provided them with the ochre and see where they go with it? If they paint rocks or themselves or things like that? (Tammy)
Yeah. That's actually a good point. We have at Wits University, there's a lot of, we're on a shale outcrop, so it's great. I mean, you can just, anytime there's any building, I'd go scavenging for ochre pieces. And so we could so easily do a workshop outside and then people could pick leaves or find

feathers or whatever and make actually their own paint brushes as well, or their own tools to paint. So, yeah, that's a good point. And especially with COVID it's great - you want to do outdoor things.

Yes. The more outdoor the better. And we actually have a followup question to this from Basma, asking: **If you think of people in the past, what did they use? Did they use their fingers or their sticks?** (Tammy)
So most of the South African rock art is brush painted and they would have, must've been really skilled at making good paint brushes as well, so using animal fur, or feathers and so you get really beautiful fine lined rock art. But then you also find as different groups moved around South Africa as well, there was a mixing and you have finger painted rock arts in different colors, usually, ranging in the ochre colors and the reds and oranges and yellows, and then sometimes whites and black as well. But yeah, most of the South African rock art is brush painted.

That's very interesting. I'm completely ignorant about this topic so I had just assumed that brushes were much, much later. But yeah, that's very interesting.

(Tammy) It is, well, so, let me just put it, so Middle Stone Age, then you don't have any evidence of painted art but in the Later Stone Age, so the oldest dated rock art we have is in Namibia, which is 27,000 years old, but most of the dated rock art in South Africa is from about 5,000 to 2000 or 1000 years ago.

Okay. Interesting. Thank you, Tammy. I have a question for Victoria: **I understand that this was a student project. From your perspective, did the experimental component make it more interesting? And so do you plan on continuing doing experimental archaeology and why or why not?**
Definitely. Being able to actually get my hands on practical things, I prefer to, I'm a visual learner and tactile learner. I like to actually work with things. So having it be an experiment did definitely make it a lot more interesting for me. And yes, as I mentioned earlier, I am continuing it into my master's research.

Perfect. Yes. Great. Always need more experimental archaeologists. I was also curious, **did you trample the stones yourself at the ground or was it animals or?** (Victoria)
No. So I did it myself. It was a period of a whole month, 10 minutes a day, stumping, jumping around on a little place in my garden that I had made into a little trampling pit. It was supposed to be on the [Varsity] Campus, but because of COVID I had to do it at home. So luckily I found a nice space to dig up that wasn't destroying my garden completely and I did it all myself.

Perfect. Okay. I imagine you got some good step counts in. Thank you very much. We have another question for James following on from your previous answer: **Would there be a difference in the result of the sculpture in the lost wax method versus sand casting?**
Yeah. So with sand casting, unless you get the sand incredibly compacted, you'll have a little more porosity. With the lost wax casting, you're forming a clay over it, so you can get a very sort of flush surface. So it will require less sanding and cleaning up in the, in the post casting process.

Okay. Interesting. **Out of curiosity, were you already, you sounded like you already had quite a lot of experience with metalworking in casting?** (James)
I had literally none actually. My previous degree was in Classics and I'd spent years studying sculpture without actually having learned anything about producing them because Classics doesn't really focus on production or the more human side of archaeology. It focuses very much on the arts and the sort of styles and the narratives you can draw from various skills. So actually, the reason I got into

experimental archaeology was that I wanted to learn how this was done. And that's why I did the program.

Okay, nice. So we have the other side of things. **Did you then work with experienced casters or metal workers, or are you planning to do that for future experiments?** (James)
I would really like to work more with some experienced people. I got the opportunity to work with Neil Burridge during the master's program for a couple of days where they cast a few axes. But other than that, I was mostly just going off of reading and watching documentaries on castings for the most part. A lot of it was very ad hoc when it came to setting up the process.

That's very interesting, thank you very much. We have a question for Fergus: **Thank you for your presentation and everyone else's. Will the experiment be facing the prevailing wind? Could the thatch at the edges be unequally exposed? Will you be trying combinations of thatch material, for example, a turf base layer and a heather outer layer. Also, what happens to old thatched roofs at Butser and have any been analyzed botanically?** So first part was: could the fetch at the end be unequally exposed if they face the prevailing wind?
We haven't decided yet. That was one of the questions in the presentation. We haven't decided yet whether the test rig we're going to set up will face the prevailing weather or away from it or whatever. We haven't seen a lot of difference on the existing roundhouses. No matter which points of the compass you look at, as long as the thatch layer or whatever material we're using on the roof is well attached, it doesn't seem to be a huge difference depending on whether you're into the prevailing weather or away from it. Moving on to the other one, you were saying about sort of combinations. I glossed over that in the presentation, because you just get so many permutations of things. Something like bracken, for example, which was one of the materials we want to test. My feeling at the outset would be that bracken would probably be perfect for a temporary short-lived shelter like you might put up for lambing, which we're going through at Butser at the moment, something that would just last a few weeks and then would start to break apart. But bracken might be a wonderful material as a base coat to be topped with a thin layer of thatch or something. But there are just so many permutations once you start getting combinations of layers. And specifically turf was mentioned there. The thing with turf roofs, we've done a couple in the past and the actual timbers for the roof structure need to be a hell of a lot thicker, more substantial, because there's a lot more weight with the soil. They're able to soak up rainwater and put a load more load bearing on the roof structure itself.

Okay, thanks. The last part of that question was: **What happens to the old thatched roofs at Butser? Have any been analyzed botanically?** (Fergus)
I believe the last time we had any done was by Reading University. Our previous largest roundhouse on site, they actually came in and they did some analysis on that, but I don't remember what conclusions they came to. They also trenched across the floor and stuff, but I thought they did look at the actual roof. Because of the burning fires inside the house all the time, we do find it really does tend to kill off insect life in the thatch. So there's not really much living in there. But yeah, I'll need to go back and see what Reading University concluded because it's a long time since I've looked at that.

Okay. No, that's an interesting idea though. Also that they dug trenches. That's really interesting to hear. I guess it's a perfect opportunity. There's lots of examples. **Was that also something that happened at Butser in terms of excavations happening during rebuilding or during something to see what happened after five years, 10 years, etc.?** (Fergus)

Yes. I have to say Reading University, definitely on their largest house, they put several trenches across the floor and the wall boundaries just to see what was going on there. Most of the time we tend to take the buildings down and not do that sort of post-demolition work.

Okay. **Out of curiosity, that one, do you know if it was a blind trench dig or did they already know what was there?** (Fergus)
I think it was blind, actually.

Yeah, I would make sense, but that's an interesting concept, thank you very much Fergus. Continuing with Butser Ancient Farm and directionality, Trevor, we have some questions for you here: **Is it correct that the entrance to Bronze Age roundhouses generally faced south-east so they could catch the early morning sun in the winter?**
Bronze Age, I'm less clear about at the moment, but Iron Age, it's generally said that's the case for Iron Age. However, there is an opposing opinion on that. Rachel Pope has done in her PhD dissertation, basically, if you like, disproved that, certainly in Northern British roundhouses and found that there was a bit of selective materials, selective choosing of sites to try and justify an idea that either there was a sort of solar cult or there was a desire to get early morning sun. So there is a tendency for them to [do that] in the Iron Age, and I suspect the Bronze Age as well, a tendency for them to face somewhere between East and South. *Tendency*, but there are many, many roundhouses that face in all sorts of other directions. In fact, there's a whole settlement in Wales where all of the doorways face West.

They liked a stiff morning breeze with their breakfast apparently.

(Trevor) One interesting thing is, because the prevailing wind in Britain is from the West, we find that our roundhouses, most of which face roughly east or the doorways, they perform much better smoke wise. None of us likes to be in the one roundhouse that has a west facing door because generally speaking, the prevailing wind just forces the smoke sort of into your face and doesn't allow it to draw through the roof. So practically, they seem to work very well, but they are not universal in any way, shape or form.

Okay. Oh, that's very interesting. Thank you for that. Also another question (Trevor): **Is it possible that the Early Bronze Age earth house could have been accessible from a hole in the roof and down a log ladder?**
I saw this question earlier and I love it. There is both evidence and inference on the way roundhouses were accessed. The most clear evidence is that many roundhouses in both Bronze and Iron Age show clear doorways. Often they have a porch feature on the doorway. So it's a clear and well used entrance. The other evidence really is that there is some evidence for the structure of the roofs in both Bronze Age and Iron Age roundhouses which survives in the archaeology, particularly at Must Farm, which is a really important Bronze Age site where we see the structure of the roof. The structures of the roofs are also written about in some of the Roman historians' work. And there is in fact some evidence of Gaulish roundhouses depicted on one of the triumphal columns in Rome, it may be Trojan columns. So we know that the roofs had quite a conical or dome shape, which means that you'd have to basically build a ladder to climb up on the roof and then climb down. So practically, it doesn't make a lot of sense, but what I think is great about the question is the real answer is, I don't know. I've never seen a Bronze Age roundhouse. I'm quite old, but not quite that old. And what we're trying to do is introduce a level of indeterminacy in our interpretation. So we have a wide range of chronologies on the farm now and how structure changes a lot really over the 4,000 years of chronology in our cover. What we want to do for our visitors is to make sure that they're asking those

same questions. We're only proposing a hypothesis with our houses. So we would really love our visitors to come with exactly those questions because we don't have the answers. So it's a perfectly legitimate question. As I say, we do have good evidence for doorways in Bronze Age roundhouses and Iron Age roundhouses, not evidence for our house. The other inference we can make is that if you put a hole in the roof in Britain, it'll get wet on the inside. And that's actually not a trivial answer because it leads me to something else, which I didn't fully answer before on the question about the walling. So I'll just digress and then shut up. But at the end of the Bronze Age, we're getting sort of towards the end of the Bronze Age with the house we're building, the climate appears to get rather cool and wetter in Britain. And through the Iron Age, we get the formation of a lot of peat. Peat walling is very possible in British prehistoric houses. And it's certainly known from historic housing. However, we also dismiss peat walling as there's no peat in the area that we're basing our archaeology from in the South, as I said, very thin soil. So they didn't develop those thick layers of peat. If we were in the North of Britain, we would certainly consider that as a walling option. So hope that more fully answers that earlier question about walling as well.

No. Great. Thanks. I actually just saw that someone has posted a question: **Have you tried using the cob technique for building the walls as this wouldn't leave traces in the archaeological record and there are still old buildings in Devon built from cob?** (Trevor)
Yes. That's essentially what we're going to be using is cob or rammed earth. So it's basically using earth which usually has something added to it, like a fibrous material, to give it a certain degree of flexibility. It's wet, and then it's rammed into, usually into some sort of form work. So it is basically compressed and it forms a really durable wall. It lasts for centuries. And so I think that's my understanding of cob in any event. That's what we're going to be using as far as we know. As I mentioned earlier, we may consider other variations on it, but that will be the main walling technique. What's interesting for us is that I mentioned before that the soils we have are quite light glacier loess soils, and we don't have a lot of clay. And I think clay would form a, it potentially would form a more durable ball. So we'll be interested to see how, whether our earth wall is very durable or whether the material just doesn't have enough clay in it to bind well. We'll actually build the roof, the frame of the roundhouse. First build the roof and then thatch it, and then build the walls up underneath it because erosion we think will be such a problem with the sort of soils that we have around here.

Okay, thank you very much. Very detailed answer. We have a couple of more questions here from our speakers to each other. So our first question is from James to Linda: **First of all, congrats on 20 years of the Experimental MA, I loved doing my master's there. I've had a lot of students from Exeter saying how much they enjoyed doing the Master's program there. I was wondering if you had any big plans for the program going forward?**
That's huge. Thank you, James. I have to say one of the really nice things is just seeing how many people are here, doing things and just, it's giving me a real buzz. And sometimes as you can imagine, you run a program and you get the bureaucracy, but actually, this is the stuff that makes it worthwhile. So there's a couple of ideas I've had going forward. This year, it's been an extraordinary year and I've currently got students that I'm actually teaching practical elements to in Dubai, California, Slovenia, South Korea. It's been such a challenge, but it's also made me really think, there are ways to do things and there are ways to really make the hands-on face-to-face do perhaps even more than we were doing with it already, but there are also things that can be done at a distance. And that's something I'm certainly going to think about. The other thing I have to say is, there are so many people who I kind of just chivied them a little bit, so a kind of a gentle kick and that meant that they've turned their master's dissertations into presentations for the conference. And I am thinking, I'm not going to let them slide back from that. And I'm thinking, okay, how can we have a kind of a

discussion group to kick them into the next stage, the publications arising from that? And how can we make sure that that happens and rolls through so that it's like, okay, well, you've done this. Now you do this. Now you do this. And so I've got ideas about how to incorporate that and habits so that kind of feeds back into the present master's students, because I think everybody will benefit from that kind of intermingling of different years within the program and how they can take it forward. And I guess the other one is my colleagues over the years have changed. And so, my colleagues are influencing some of the things I'm thinking about. So Alex Pryor with fire, and Hajnalka Herold with some of her work with glass beads now as well as pottery. We've also obviously got metallurgy with Gill and forensics with the lovely Laura Evis. She has really opened my eyes to the way in which so much of what is done in the names of forensics relies on experiments. And there is always a way in which there is a crossover between the two subjects and we've been, co-teaching a module this year. And I just think there's lots of ways. And working with people from the Human-Animal-Environment Centre and the Centre for the Archaeology of the Americas, there are ways to make combinations work with your colleagues and they take you in directions that you'd never really planned out for yourself, but which are really interesting ways to be working with people. You find out more about your colleagues, you find out things that you didn't know. And I like that. So more of that stuff I think. More of things we don't know yet.

Okay. Sounds very promising I think, for the future. Basma actually, moving on from that: **What is the status at the moment of experimental archaeology in Egypt from your perspective? Do you see it as something that's increasing in popularity?**
Actually my researches were the only and the first experimental archaeology studies in Egypt and no one here knows too much about experimentation. And there is no one to help to fundraise such research. That's why students here don't prefer to use this methodology in their research. But I started that and I think, I'm doing a lot of public lectures to let people know more about experimentation and how it is useful for museology and heritage. I'm trying to do that my way and without any help.

Oh gosh. Sounds like a lot of work for one person. **How does the public in general react to ideas of experimental archaeology?** (Basma)
Actually, they like the idea very much, but once they started to think about money and how much I will spend for this research, they stopped to think about it again. But my lectures at [...], I think they like it very much. They like the way I try to show them how it is important, to any archaeologist, to do practical things to know more.

Yes, no, I think so. Which is also what other people indeed have been saying. **And I mean, I imagine that the research that is happening in Egypt, there's so much archaeological research happening there, there must be many opportunities for different projects to emerge?** (Basma)
Yes, but they do it the academic way, only normal research. But the experimental no, no one uses experimentation here yet, except me.

Oh, okay. Oh gosh, the whole world, the whole world of experimental archaeology in Egypt on your shoulders! Linda had asked a question about Chrissie's **experiments with sleeping on the sedge. So perhaps you could expand a little more Chrissie?**
Well, I did gather cyperus sedges down in the Sibudu river, I mean, the river near Sibudu. Cyperus has a very long and spongy stem and it's quite easy to harvest. And I carried them up to the Cape and I laid down on them and they were incredibly comfortable and I used to make visiting lecturers also lie down on the sedge and everyone agreed, it's very comfortable and fresh smelling. Except for [little] pests, sometimes a tick will crawl out [at you], things like that. It's a very pleasant thing to lie on. In

contemporary society, a lot of people still use those cyperus textilis culms for making mats, which are commonly known as ‘single beds’. They’re quite long lasting and they work very well. So that's at Sibudu. At Border Cave, we recognized, rather than sedges, we recognized that the bedding was dominated by grasses and we didn't have grass seeds, but the phytoliths indicated that they were probably, the leaves and stems were from Panicum. And, in contemporary times, Panicum grows at the mouth of the cave. So two guys decided to volunteer to sleep at the cave one night on Panicum bedding. And they enjoyed it. Well, no, I mustn't say they enjoyed it. They were pleased with themselves for doing it. But they sort of kept on rolling out of bed because the floor wasn't flat and of course they couldn’t flatten the floor because of the archaeological deposits beneath them. So they didn't say that the grass was uncomfortable to lie on. And so, I think that it makes a pretty good bedding because not only the archaeology but the ethnography, quite widespread across South Africa talks about grasses being used for bedding, but often with additives like sweet smelling herbs and also not only one material. Sometimes you'll have a mixture of sedges and grasses. And so, yes, so I haven't spent a whole night on the grass bed, but I have used the sedges and I think it'll work very well for anyone when they’re out camping to try it.

It sounds nice for... when the sun starts to come out here in Europe. People can go out and see if we can start trying to do these things. I have a slightly related question: **You mentioned talking about preventing the pests in the bedding by fire as a by-product of fire activities. Do you think that this was knowledge that was passed down through generations or was it an accidental discovery made as a by-product of lighting fires near bedding?** (Chrissie)
I think it's quite difficult to answer that question because one can't really be sure but, certainly people would have recognized the sanitizing properties of ash. And we find ash quite widely used in Southern Africa for sanitizing. So for example, chili mixed with ash will be used to keep seeds free of pests. And so I think that perhaps at Sibudu and at Border Cave, people were burning the bedding, not only to get rid of pests, and I'm sure it got pretty smelly, I mean, we see little bits of bone, various other things in the bedding that could've made it smelly. And so you burn it and you have this twofold good result. Where you have a flat surface, which is nice and smooth. And then you also have the fact that insects don't like to move over ash because it affects them and deters them. So, yes, to get back to the question, I do think that people would have recognized the efficacy of ash.

Okay, thank you very much. I see actually that you had posted a question in the chat as well to Fergus related to this. So for Fergus, this is for you: **Your observation about smoke from fires killing pests in the thatch is interesting. Chrissie notes that in South Africa, there are ethnographic records of fires with wood that produces poisonous fumes, deliberately being lit in huts that are then shut up. Might this have happened in the Iron Age as well?**
What I said in response to that is that I'm not aware of any use of special woods or plants that could be burned to produce a toxic atmosphere in the house to kill off pests. Just the normal smoke from wood-fire seems to be enough. And I've certainly observed in the past at Butser with our newish roundhouse that we hadn't yet started having fires in, that birds were pulling apart the thatch in order to get out insects that were living in the thatch. But once we started having fires regularly in there, so just normal wood smoke filtering out through the thatch, it clearly killed the insects in the thatch and the bird behavior had then changed and they were no longer landing on the roof and poking around in the roof to find insects. They seem to know that there was gonna be nothing there for them. But it's an interesting question. Coming much further forward in time, I know when tobacco was introduced that that was used for fumigation certainly in Victorian times, but in terms of the prehistoric period, I'm not aware of any special plants being used to produce a particularly toxic smoke.

Okay, thank you very much. We will return..., oh sorry, carry on Chrissie.
(Chrissie) Sorry. I should have put my hand up. What I wanted to say, is that in ancient times, for example, at Sibudu as well as in Border Cave in the Middle Stone Age, we have charcoal of a very, very poisonous wood. And if one burns that wood, and you smell the smoke, you have quite strange experiences, but it will also poison meat. And so the people burning that wood 60,000 years ago, I think also 200,000 years ago, would have known that it was poisonous. And so perhaps there's a history of the burning of poisonous woods for specific purposes far, far back in time.

Okay, thank you very much for that insight. We're going to return now to Victoria: You've had a load of questions come through for you. So first one is **Why boil the bones? Wouldn't people in the past have used them fresh, and how might this have altered the results? For example, boiling possibly weakening the bone, residual grease in fresh unboiled bones causing the tools to interact differently with the work materials, greens in the substrate, etc.?.**
So, I boiled them so that I could take better microscopic images of them but you saw that none of the meat or periosteum is in the way of taking the photos before and after use and after trampling. Otherwise, you can't get very clear images. I'm not sure how it's use with the meat and flesh and everything on it would have affected the experiment because I've always just seen that the bones get cleaned before use.

Yeah, that's a fair enough answer, I would say. Another question is: **How compacted were your experimental substrates? My concern would be that artificial substrates would likely not be as compacted as natural substrates, potentially resulting in more vertical movement within the substrate, perhaps leading to less breakage, but more scratching. So how did you account for the difference in perhaps artificial versus natural?** (Victoria)
So the compaction, I mean, It would only happen over the 30 day period of me trampling. So obviously, it's not going to be as much as thousands of years of trampling in an area. The vertical movement was not, the experiment wasn't necessarily looking at movement within the sediments. So I didn't pay much attention to it other than noting which sediment had more movement than others, but I didn't specifically look at horizontal and vertical movement of the bones in the sediment. But beach sand definitely had the most movement because it's still at least compact and the clay sand immediately just compacted and things barely moved within that sediment.

Okay. **And is this something you're planning to then look at further in your future work?** (Victoria)
Possibly. I'm not entirely sure about the whole trampling aspect, but more of looking at the actual marks that I found from these experiments and then comparing them to actual bones and bone flakes from sites that we found such as Klasies in South Africa to have a look and determine possibly if any of these flakes are actually utilized bone or just the result of trampling.

Okay, so Victoria, one more question for you, then I'll let you take a break: **You talked about picking the function of the bone flakes based on their shape, rather than trying to create a specific shape based on a planned function. Do you have archaeological evidence for this, or why did you use this approach?**
So I kind of looked at it, I don't want to say logically, but to pick a bone that's sharp and easy to hold would be easier for cutting than to pick a bone that's randomly shaped, odd shaped, and not easy to hold. So just kind of based on an assumption of what would have been easier to do. I didn't particularly shape any of the bones to use. I used just the raw, whatever came off when I used a hammer stone to break the bone flakes off. So I just decided to do what seemed easiest.

No, that sounds reasonable. Especially with the amount of work to do, it's always nice to not always overcomplicate things. Okay, great. Thank you very much, Victoria. We have some more questions here for Tammy: **Wonderful work and stunning material. Apologies, many questions from another ochre lover. The participants in your ochre painting workshops don't seem to wear any cover to protect their clothes. It sounds silly but I had questions from parents and participants for my workshops asking if ochre with water will stain their clothes which sort of happens with red ochre. Did you have similar questions? Do you work with people around Africa still processing ochre traditionally and using it who would know more about this?**
Yeah, there's definitely a lot of mess and ochre is awesome. And I always tell people they have to embrace ochre, but I think the reality of it is that most parents are not going to want their kids coming home with stained clothes or stained school uniforms especially. But it doesn't stain. It can mostly, where if it's just mixed with water, even the darker red ochre powder, it washes off pretty easily. Even on your hands you might need to take a few washes, but on clothes I've never had issues. And often I get ochre all over me and I can wash most of it out. We do sometimes do experiments where you're mixing with egg or with coconut oil or something that you might have a little bit more staining properties, but on the whole, we haven't had issues with that. And then the thing on working with other communities around [Africa], South Africa more is where I've done any work. And it's more incidental for my own work that when I see someone that is using an ochre paste or red paste on their face, I will always ask them, where do they get it from? Are they getting it from a river naturally? Are they getting a clay that they're just mixing with a bit of water and putting on their face and, but a lot of it's all, just asking them where they got it from. But a lot of the time people are actually just buying store-bought iron oxide. It's really cheap and mixing it with water and using it as sunscreen. It's used richly here with many of the cultures in South Africa, but a lot of the time when I've chatted to people, it's just used as a very cheap sunscreen basically. And it's pretty effective as a sunscreen as well. But I would love to do more work. I know again, Riaan Rifkin has done some work with the OvaHimba in Namibia. And I think generally in terms of Middle Stone Age research, there's been lots of ties with how the OvaHimba process their ochre and what they mix with the ochre. There, you'll see beautiful images of people completely covered in an ochre paste there, their hair and jewelry and clothes and their whole bodies. And there's been some ethnographic research done on what are they mixing with it? They mix animal fat. Or what kinds of ochre are they using for this ritual? And it's as a skin protection. But me, myself, I haven't done much.

It sounds like it's the only thing you need, really. I mean, if you have ochre, you have everything, you don't need any other material. **For people who are interested, we've had a couple of comments from people saying they're interested in learning more about it, tools and techniques etc., because I think especially here in Northwest Europe, ochre was used as well for many, many thousands of years. But there's not as many sources, perhaps. Can you recommend any sources? Someone has mentioned apparently Riaan Rifkin's experiments with ochre and hide tanning. But yes, if you have any more that you can suggest for people?** (Tammy)
Yes. There's so much. I think everyone is welcome to contact me. I do go by two names: I'm Tammy Hodgskiss but my married surname is Reynard. So just in case there's any confusion with that. But yeah, please contact me. I'm happy to give papers. I'm happy to send ochre with love from South Africa and I'd love to connect with more people.

Perfect. Thank you, Tammy. Okay.

Linda: Can I comment on that point, sorry to interrupt...

Yes, go for it...

Linda: So, I found Tammy's talk wonderful, but there's been so much about ochre at the conference. It's both colorful, but it's got this unique quality of drawing people in somehow because of the color, but then there're all of these other useful things. And so, Tammy, we'd love to have a chat with you. My colleague Teresa Emmerich Kamper is speaking later on today and both she and I do a lot of work with hide tanning and I have used ochre and done work with it. And so has Theresa. So we'd love to be part of those discussions.

Tammy: Cool, that'd be wonderful. I'd love to as well. No, it is an amazing, an amazing material. And it is like you said, it just is so versatile, which makes its interpretation in the ancient past very difficult, because we don't know, were people choosing it just because it's red or were they choosing it for the various other uses. I mean, it can even be eaten as an iron supplement, you know? So it's an amazing material.

Linda: It's also… I don't know if you've found its smell is so distinctive and in the same way, if you cut yourself, the smell of blood is a particular smell. It's because of the iron and the ochre smells the same way.

Tammy: Yes. That's interesting. I suppose,... there's different sources and you get some really nice… like almost [wet shales] that would..., feel almost fatty, you know, and they've got like a nice shine to them and it would depend on the source. Some are very clayey. But it's a very good point actually. Yeah. That it is that, that connection with iron and with our blood. It's cool.

Okay. On that happy note, blood, I will move back to housing. So Fergus: **In regards to, also Trevor mentioned in his presentation, the terms of what was the most practical and that side of things, but do you also take into account, for example, stylistic influences? Also maybe status materials? I can vaguely remember learning somewhere about how different tile colors during the 1600s in the Netherlands would have represented the owner's wealth, because some were more expensive than others. Do you know of any similar examples to this or hypothesized examples for earlier roofing materials as well?**
Simple answer, no. It's a really interesting question. And I got some information yesterday that came through from some of the archaeological excavation at Must Farm, the site I mentioned before, where they've discovered the roofing materials included clay, turf and thatch, which kind of confirms my long-held belief that I think most roofs in prehistory or many roofs in prehistory would have actually been a composite of a lot of different materials. If I use one example of a roundhouse that we have on site, to thatch it to a waterproof standard, it's a large building, it's 15 meters around with a 45 degree pitch on the roof, so a large cone, it would take somewhere between, let's say about 10 hectares of land all under a cereal crop with good length cereal stalks to thatch that roof. And that gives you some idea of the sort of resources that are needed. So I think in many cases, a lot of the issues surrounding roofs will be resource-based. So, imagining someone in the Bronze Age planting 10 hectares of a long straw cereal, just to harvest it for a roof seems to stretch credibility. But that said, I suspect that there were status differences in roofing that sort of became evident. But my overall belief is that the vast majority would have been a composite of different materials based on convenience.

Okay. **So also a mixture of both convenience and choice in that respect one might say.**

Yeah. I don’t want to take human agency out of the equation altogether. So I'm sure there are preferences, but I think often the sheer practicality of the sort of resource management meant you're often sort of dictated to a little bit by circumstances.

Okay. No, that's very interesting. I have another question for you while you're here: **Do you think there were separate work buildings for tasks such as metalworking, green storage, processing and other things that would not work well in a dwelling?** (Fergus)
Yes and yes. I don't actually like the name roundhouse, because in general, we had no idea whether it was a house or whether it served some other function. So often onsite, we'll call our buildings house, neolithic house, Iron Age roundhouse, that sort of thing, Anglo-Saxon house, but we often don't have evidence like hearths or other material evidence to suggest that it was used as a house. And in fact it may have been a room. So the houses may have been sort of deconstructed. As I think in some African villages, you often find small unit buildings that serve as, one is a bedroom, one is a kitchen and so on. So even within the scope of a roundhouse, I think a lot of them weren't houses. They were used for sort of craft functions or processing of materials, or maybe just sort of lounge activities. And also in the Iron Age archaeology of Britain, for example, there are vastly more rectangular buildings than there are circular buildings. The general consensus is that circular buildings were domestic and that rectangular buildings served other functions, which could be craft manufacturing and storage, grain storage, and things like that. So, yeah, I think there was. I hope that answers the question. I think I sort of wandered off the scene, but I think, I think the term house, as I was using roundhouse, it's a term that historically we're stuck with like Stone Age and things like that, Bronze Age, that no one particularly likes. But we're stuck with it. But I think it's a misnomer. It certainly can't be applied universally to all buildings that happened to be round. I'm sure they serve different purposes.

Hmm. No, it’s also an interesting point as well. Perhaps things should be reconsidered in terms of naming conventions and this side of things. While we're on Butser, I have a question for Claire: **How was the first neolithic structure damaged by the storm you mentioned? So the walls, the roof, the overall structure, how was the damage spread? Do you think the orientation of the house and/or the surrounding environment, so trees for example, impacted on the damage, making it worse or saving the house? Thank you for the presentation. It's a very interesting example of accidental damage.**
Okay, so to go back to the beginning, if I can remember all of these questions correctly, the way in which the building was damaged by the storm is partly I think to do with the materials from which the building was originally constructed. This is the previous building, not the one we've recently constructed. So the previous building was based on some archaeological evidence that came from the North of Wales and that archaeological evidence suggested very very small postholes. In other words, this was a quite large structure of about 12 meters length by six meters with upright posts for the construction of very small diameter, only about 10, 15 centimeters maximum diameter. And it was really an experiment by one of my colleagues to demonstrate that this could have been a viable structure and that it could have been roofed. So I think that fact that it lasted for over five years before this damage was really a testament to his building abilities. But that said, obviously because of the small diameter of the timbers, when this storm hit the building, as one of the questions says, was the way the building was situated, partly why it was damaged by the storm? And my answer is probably yes. So a combination of the direction from which the storm would have come and the angle which the building faced that prevailing wind, played a large part in making the buildings start to twist. And this has to do with the way the building was constructed inside and because of the small timbers, we couldn't really, we braced it, but there's a limit to what you can achieve. So the first thing we really noticed is that all of the daub on the building had huge cracks across the back wall. And that back wall was actually facing directly into where the prevailing wind would have been hitting the

building. So that's really what happened is that over time, I think this was the, excuse the pun, the final straw. And it's really exposed to the weaknesses of the building.

Interesting. And so I suppose, similar to the Trevor's answer earlier about orientation, **do you think that where they would have been structured, in terms of wind and things, would also have been taken into account in that respect, in terms of how much damage there would have been?** (Claire)
Yeah, absolutely. I mean, the doorway in that building faced nominally south which was based on archaeological evidence, but I think that must've played an enormous part. Of course, our interpretation, the three-dimensional interpretation from the archaeological footprint, is simply an interpretation. And that applies to all of the buildings we construct. So that building had a gable end. What I mean by that is a vertical wall of door right up to the top of the building with a small gap at the top for smoke to travel out of. So what we did is create a single face against which the wind would have blown. And our experience at Butser Ancient farm showed you that a round building survives bad weather much better than these buildings with large gable ends. So a huge advantage to building a round structure is that there's nothing for the wind to blow against. It travels around the building. So I guess if you look at this, the previous building, we only interpreted it in one way with this vertical gable wall, but there could have been other interpretations. Perhaps the roof could have been hipped; so the end as well as the sides could have been at a 45 degree angle, that could have been a different interpretation. And perhaps it would have responded differently to that storm. But I guess we'll never know now.

Are you planning to build any more with that in mind? With those different, alternative interpretations, shall we say? (Claire)
Yeah, it's a really interesting thing. Of course you build a building in one way and sometimes you do remedial work. You repair things as the building travels through its lifespan. And again, my colleague did this with one of the buildings. We have more than one Stone Age building, there are two smaller buildings. One of them is called enigmatically 851, and that's from Durrington Walls, which is a site just near Stonehenge. And after a few years of its existence, it too was starting to suffer from possibly, damage by wind. It also had a gable end and actually my colleague revised the roof structure midway through the building's lifespan and created a [hat] feature on two more sites so that all of the roof is actually on a slope now. And the building has continued therefore to… it has given it a bit more longevity. So we, in a way we kind of, we explored that concept through doing that.

Okay, great. Thank you very much. So we have a couple more questions and then I'll wrap up. So a question for Basma: **We had another talk yesterday I think, about the use of animals in experiments, so using horses this time. You mentioned already that there are vessels of a very similar shape that are still used quite often in Egypt. So were the camels already used to carrying this kind of load, how did they react to carrying the amphorae? Did it seem to bother them more or less? Did it not really make a difference?**
Yes. As I told you before, is that the people here in Egypt, [are] still using the same pottery storage in their life. We call it [...] . It's something like, it looks like the amphorae. We still use also these animals like camels, donkeys, but not all over Egypt, only in the South of Egypt and in farms and they still use the same shape of this pottery storage in their life.

Okay. **So the camel was probably just like, oh, it's another day, nothing special?**
Yes. That's why I went to another government. I actually live in Alexandria. I went to Qena because there they still have the same old life. They're still still using the same technique and everything. And I started my experimentation with an ethnographic study to know more about that society and how they're still using all the techniques and everything.

Okay. Great. Perfect. So will there be, as a followup to this question, **will there be more experiments done with different animals or do you think that camels would have been the principal animal used in the past?**
Actually, I'd like to do more experimentation with the animals but here in Egypt we use only camels, donkeys and sometimes oxes to push and pull the big parts of rocks.

So there's only a few options, really?
Yeah, I think.

Okay. Thank you very much Basma. So another question for Fergus: **How many different people did you consult or do you generally consult about the best way to build the roofs? What kind of experiences did they have?**
I've quite deliberately actually with this, not done too much digging into other research people have done. I wanted to come at this fresh and just try out some of the materials first and then compare it to other people's experience. Going back to something Trevor said a few minutes ago talking about the amount of land you'd need to grow thatch for a roof, I'm aware for example, that there have been experiments done with using spelt straw for thatch which have been pretty successful. But I didn't want to contaminate my thinking by reviewing all these previous experiments. Our just wanted to try out some materials over a period of time and then see what other people's experience with them was. Does that sort of answer your question?

Yeah, it's a good approach I think, an interesting approach rather than being too overly influenced perhaps by other things. Thank you for that. Two more questions. Last one for Trevor: **Do you already have insights from the social prescribing project or know of any other similar projects that have been successful?**
I do. There was a project called Human Henge and it was conducted out of the University of Bournemouth. I think it was led from the University of Bournemouth, which was a collaboration between the archaeology department and the the health department or the health sciences department at the university, as well as involving some other outside organizations and it involved engaging with a group of long-term mental health suffers in engaging them in the landscape, well archaeological landscapes, specifically at Stonehenge and Avery. And what they did was, used sort of art based and performance based interventions in the landscape or engagements with the landscape and they found anecdotally significant benefits to people's sense of wellbeing. So I think the premise is that archaeology is in Britain anyway, relatively nonpolitical, although we can debate that, but, in terms that they were engaging nonpolitical, it was non-current, it doesn't have the stresses associated with day to day life. So they found a, as I said, anecdotally significant enhancements to people's sense of wellbeing. And that was an inspiration for me. That was really the sort of wellspring for doing this. Now, that project can be accessed as a publication that can be accessed online. And if you just type in a Human Henge Project, you should be able to find it as a free PDF download. It's really worth reading. They didn't get a huge amount of data if you like, hard data, from the process. So what we're going to be doing on this project is we're engaging a specialist who will use some metrics which have been developed precisely to study wellbeing across time using activities. So we're going to actually be able to gather data on it.

Okay, perfect. Thank you very much. I look forward to hearing more about it. So the last question is for Linda, it's a two-part one: **So you have a lot of experience with experimental archaeology centers. Could you maybe explain a little bit, so for those who are wondering maybe, do all centers usually have the same form of experimentation? Are there specialized ones? And also as a second**

part to that, what advice would you give to students or professionals who wish to conduct an experimental archaeology project in countries or in institutions which perhaps do not have such a strong experience or not as keen to continue in experimental archaeology?

Well, that's two really quite huge, really interesting questions and what a note to finish on. So in terms of the centers, I've worked a lot with different archaeological open-air museums. And in fact, one of the things that I know Roeland had to do first, when he was tackling his PhD was just come up with a term for them. And whilst that term archaeological open-air museum is now accepted, there are farms, there are centers, there are heritage interpretation centers, there are parks, some combine working with archaeology with an ecological perspective like the Steinzeitpark Dithmarschen in Germany that we worked with. Some are very much education-orientated like the Parco in Modena. And others are about a place and a time. So although Butser, obviously it's grown so much, but it started off as an Iron Age, but it now does so much more. Val Senales, the archaeo park there, is very much centered on Ötzi and that particular find because that's, if you like, how they were set up. So the models for all of these different centers are incredibly varied and some actually close during the summer because they are orientated towards the school year and others it's completely the reverse. And if they shut at all, it's during the poorer weather season of the winter. And many have a mixed sort of mosaic of approaches and all of those offer different opportunities for experiments. I've never met anybody from any of those centers who was not interested in experimentation in the broadest sense. Some would like more opportunities to publish, but obviously if their main job is education and interpretation, then that's where their focus is. But the way in which EXARC in particular has been opening up opportunities to publish on these sorts of topics so that people can learn from each other and the world of the internet is both minefield out there, but it's also got these absolute treasures, repositories of information. And EXARC certainly acts as a channel for all of those. And each one of the speakers is also a resource in themselves, and there's a couple of ones where I'm going to go and I'm going to look for their websites and find out more because I know it will be there. So it's a treasure trove and one size does not fit all. And that is just brilliant. It's a mosaic of different opportunities and places. What that means for the second question, which was really, what advice would you give for people who are not perhaps in places which do a lot of experimental archaeology, is squeeze it in where you can, because I really think that it's a way of engaging with practical primary data generation and all kinds of resources, centers, academic, or educational, love the fact that you are engaging directly with material and generating original ideas, original prospects for them. And I really think that there will be ways. What I think gets in the way of that sometimes, is something that I feel like I've been fighting against for my entire archaeological career, which is the privileging of academic knowledge over, if you like, the craft knowledge that so often comes into, or hands knowledge. And so one of the things that I think experimental archaeology can really help do, is give a greater precedence and an increased importance for the role of physical hands-on crafts and craft learning, and engagement by doing as much as with your head, because you don't leave your head behind when you use your hands. You really don't. And I think putting the two together are exactly where students working all over can really make a difference. So go for it.

Thank you so much, Linda. I think that's a lovely place to end.