

EAC12 Q&A Session 2

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

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Okay everyone, welcome to the live question and answer session for Session 2 of the EXARC Discord YouTube conference. Okay, here we go.

For Kirsten: **there seems to be a particular focus on which countries have utilized traditional technologies to create sustainable and modern solutions. Do you think there's a reason why these projects are undertaken in some parts of the world and not in others?** Well, what I presented is just a very small selection of ancient technologies applied in modern contexts. So we do have an ancient technology applied in Austria, the 'Rieselbewässerung' for example, there are projects in Spain too, but it's true, the focus is on dry lands, dry areas in terms of climate conditions. So you'll find more projects with ancient technologies applied in one context in a context of drought and especially of agriculture and water supply currently. Okay, thank you.

I have a question for Claus.

How could the Laresham agriculture experimentation benefit modern agricultural practices?

Thank you for the question. Well, the thing is that when we think about sustainable farming or our kinds of modern approaches to agriculture... With a medieval focus you always have a low impact agriculture, you don't plow as deep as you do on a conventional time today, so therefore there are many similarities to what modern ecological agriculture does as well. And in this case, you can actually, from a medieval perspective, get benefits for these 21st century questions. Okay, thank you.

I have another question for you here. **How efficient were the pigs preparing the ground? Were they good enough for planting a crop?** Actually, they were, we had kind of a steep learning curve on that. What you always have to have to keep and bear in mind is that you don't keep them too long on the same spot, because as soon as they feel too comfortable, they start digging holes. And this of course is a negative aspect of that work they do. So what we did was that we limited their space so that they would just have enough work for half a day. And then we would move the meadow a couple of meters, and then it was quite effective and worked really good. And we could basically plant crops afterwards. So this worked really well.

Thank you, we have another question for Kirsten here. **With the irrigation clay pots, what is the surface like? Are they only fired once to keep them porous or do they have holes in the structure?**

Thank you for the question. Well, basically the surface depends on the material you use generally. So do you apply straw or ash or something like that? You can also roughen the surface, but there is..., I'm aware of one paper where the experiment included three holes in the bottom of the pot, and there's also weak irrigation. So you drilled one hole in the bottom and you use a wick so that you can irrigate with the wick, further away. So you know the area the pot can irrigate increases. But basically, usually you have to take care of the firing temperature to ensure that the water pours through, to ensure that enough water gets through the surface to the soil.

Okay, the next question we have is for Sara. **I noticed in one of your pictures that the potter is wearing a ring. Do you know if the material of jewelry worn during pottery production has any impact on the surface traces?** I think that material... that the clay's a factor for the quality. I have

seen that industrial or commercial material with less antiplastic elements it's better to have a shiny surface [...] natural clay is more realistic for doing experimentation. And finally, it's more real, to compare with the archaeological record. And I think that's an important factor and obviously I prefer the natural material or the natural clay for doing experimentation. Okay, thank you very much.

Our next question is for Ingrid. **You explored so many variations of weights and connections. Were any awkward or uncomfortable for the Weaver? And which was your favorite, what was your preferred, weight or connection?** Yes and no. My favourite connection between loom weights and warp threads was to pull the threads through the holes – mostly because I have done this several times on many looms in open-air museums. But although it is commonly seen on many pictures and although I like this connection, it can only be used when the holes are big enough. It cannot be used when the holes are very small. But in several loom weights in the archives of the Natural History Museum we have such small holes in the loom weights. A bundle of threads cannot have been pulled through these small holes. In that case the connection between weights and warp must have been done differently. Maybe with small sticks poked through the small holes – you saw it on slide 12. Or the threads were wound around a long wooden stick parallel to the ground and the weights were fixed on this stick with leather loops – you saw it on slide 10. It is very important that every experiment is as close as possible to the features of the excavated object and does not follow the preference of the testing person.

Did you have a particular favorite? When I have to work down on the loom weight you have to kneel and there is no other opportunity, but with a small stool, I like it very much, yes.

Okay, thank you. We have some questions for... Oh, another one for Sara here.

Did you by any chance supply any post firing surface treatment during your experiments? Not necessarily with pebbles? If that's the case did you detect any visible trace? Okay, not yet. The current experimental program is only focused in the pre-firing surface treatment. And I would like to supplement with post-firing surface treatment and a use-wear analysis, but I can't answer your question because it's the first step of the research on them. Fair enough. Always, always more experiments to do. This is the theme that we're seeing through this conference that there's always more things we want to do. Thank you, Sarah.

We have a question for Julia, oh yes, this was my one. I wrote it down earlier because I didn't want to forget it. **I find it interesting that you mentioned the security surrounding the growing of hemp. So I, myself am researching paleo-InuitArctic cultures. So a lot of my experiments are with walrus ivory, which also has a lot of issues around permits and security and it's always difficult to know how much information to give when doing public outreach, for example. So do you encounter a similar problem with your hemp experiments or do you find that people are actually more interested in the topic because of the extra, shall we say excitement surrounding it?** I think there is more excitement because of the difficulty in getting the permits. I mean, it's the first time that we're properly doing it and I should have to see, but when talking to our communications team in the City Museum I think the topic itself has great scope to reach a wider public and not only because of the [...] connotations, but also because of the sustainable usages of the fiber and as building material and and so on. So I think it's a great topic to not only further experimental archaeology and archaeology in textiles, but also to do something for a sustainable future, raise awareness. Okay, thank you. I have actually another question here about the Museum Village Düppel, which I think is also probably aimed at you.

Do you find that the volunteers also do their own experiments and does this inspire any more official experimentation? In the past they were doing a lot of reconstructive archaeology, definitely.

And then especially in the early years, I mean, it was founded in 1975 and they were..., the society, were some founding members of EXARC, they were there in 2001 when it started. There are some groups because they're organized in sort of craft groups. So you have the potters, you have the smiths, smithie and so on. And especially the pitch and tar production team. They did really proper scientific experimental archaeology. At the moment we are trying to do workshops in experimental archaeology so that the volunteers who want to do proper documentation of the experiments can start doing it. But I think mostly what is being done by the volunteers is reconstructive archaeology or archeo-techniques and craft demonstrations. Okay, thank you for that.

Jennifer, we have a question, for you here.

Do you have previous experience with weaving yourself or did you have collaboration with an experienced weaver and how big an impact do you think your own experience, if that is the case, has in these experiments? Hi, thank you for the question. So my personal experience with weaving is mostly with a rigid heddle loom. I think I made my first weaving back in 2013 or so and that has been most of my weaving experience and it's mostly just been for like personal adornment. So in terms of weaving with the work with a loom I did some pilot experiments to test my ideas back in early 2018. So going into this series of full-scale experiments I did have some weaving experience and I had at least one trial of a miniature version of a work-weighted loom before starting this. I should mention that it's not part of my PhD project. I've been examining textile tools. And so this is been in part a personal edification. So just trying to understand what they're capable of... these tools are capable of producing so that I could be more effective in communicating textile production in Iron Age Britain. So I didn't have any collaborators as part of this experimental process, however, I have read and observed from other experimenters who work more closely with the experimentation side of textile production whereas I'm coming at it from a more, textile tool type perspective, trying to understand without having textiles preserved to see what the realm of possibility is. I think I even mentioned that because it's really not clear. So my experiment concluded... the conclusions from my experiment were very interesting. But part of my weaving experience that is lacking is mainly from the warp-weighted loom. And so having collaboration potential for the future would help with anything that turned out to be an oversight from my lack of experience... would be something to explore for the future. So hopefully that answers your question. Great, thanks, I actually have another question for you here.

When you tried the greater weight at the edge and lighter in the middle, did you also find an improvement in your selvage edges and did you use a heavy loom weight only for the selvage thread group? Yes. So the first part of the question, where I was using the heavier than whites on the selvages, I did feel like with the wool, it might have improved the consistency of those selvages slightly. And then the reason why I opted for that was because Marta Hoffman noted from her observations with the Norwegian weavers that occasionally they would use approximately double the amount of loom weight tension on the selvages than they did on the center. And so it was more just trying to conceive of it as a set and that seemed like a logical starting point. And then, the second question, second part of the question. Can you repeat that?

Did you use a heavy loom weight only for the selvage thread group? Yes, I only use the heavy loom weight for the edges. The second thing I was going to say was I did want to experiment with alternating heavy and light loom weights across the breadth of the width. So basically it would go heavy, light, heavy light to see how effective they work as a set or if I noticed anything about the heavy loom weights in the middle causing problems where I didn't notice it on the edges, but I'm about 12 days from submitting my PhD thesis. So I kind of had to stop. So, you know, ongoing experimentation, these are the kinds of questions that I could follow up in the future because it's something that could potentially impact what my results might be telling me in terms of the wool

setup. Okay, great, thank you. It's again, always the case, more questions to answer in these cases. While we're on the subject of weaving, I have another question here for [Ingrid](#).

What is your experience of working with unfired weights? They are working very well. It's not necessary that the loom weights are really fired. Otherwise, when they dropped down from a special height, they will pull apart, it's clear. But the abrasion is not very essential. They lose a few gram of weight during working but that doesn't matter, I think. Okay, great, thank you for that. I actually see that Jennifer has asked a question.

The question for [Kirsten](#): a very interesting talk, very inspiring.

What periods and locations do you know of with archaeological evidence for clay irrigation ceramics? You hit basically the core question. I've been discussing with colleagues recently, the problem is we are not aware of archaeological evidence for clay pot irrigation. We only have historic... so like in books, and we were thinking about how would you, how could you prove that the findings you have actually in excavation, derive from clay pot irrigation and a colleague from the Roemisch Gemisch zentral muzeum said, well, you would have to raise awareness beforehand, so that people conducting excavations on finding sherds or clay pots are aware of that this could be evidence for clay pot irrigation. You consider the area around, is it..., of course when the sherds are from within a settlement or within a castle, it's unlikely that that is clay pot irrigation. What if you find them in the field that this possibility should be taken into consideration. And that has not been done. So I think that..., or we thought that the first thing basically we have to do is to make colleagues aware of the possibility that finding sherds and pots could be evidence for clay pot irrigation, but still, even if you consider this, we're still wondering how would you actually prove..., it's very [challenging]. So it's, it's great question. If you find a good answer, if you have an idea I'd love to hear it.

We have a couple of questions here for [Claus](#).

Has Laresham experimented with different methods of preparing fallow or previously unworked lands such as burning off the vegetation. Not yet so far. What we did was we measured the draught requirements when we think about a one-year fallow or a two-year fallow and basically saw the differences there when it comes to the draught power involved, but we didn't try out anything else yet. Thank you, next question.

With comparing the growth in the ridge and the furrow, the photo seems to show more careful placing of the seeds rather than broadcast. Was that the case, where the seeds covered after, or just left? What we always do when we're sowing is that we..., so we've widespread them by hand and then we harrow them over. Of course it's... but this is also a learning curve we have to go through... the problem with the original furrow system is that when you harrow of course the tendency is there that the harrow itself will go down the ridge a bit. And so there can be... if you're, for example, not skilled enough, the problem that you have an accumulation of seeds more in the furrows and on the ridges. What we changed after a while is that we use a set of harrows for... put to each other, so we can basically cover a wider part of the field and therefore don't have that problem anymore.

Okay, thank you very much. [Igor](#), we have a question for you.

Talking about the difference in a sort of pottery approach versus a science approach. Do you think, therefore that previous studies looking at different aspects of pottery might have been biased because they were looking at it just from one approach?

In my experience, when we started to do this terra sigillata research with Milko, it happened that this scientific approach to solving the problem was very difficult for us because we were looking for so many different deflocculants made out of all kinds of different ashes. And, when we, because we couldn't find the solution, then the second part of our research was more chaotic, on one way, because we tested also urine and a lot of different, strange materials that we thought that in the Roman times they were easier to access them. So at the end we find out that it was only the procedure which was the key to find the right terra sigillata. So we met two different approaches, how to solve the problem. Okay. Thank you.

I can't remember if you mentioned this in your talk - sorry if you did - but the, for example, you just mentioned a couple of different products that would have been accessible. Was there also written documentation that these things were used or was this more a thought of... okay, what are the possibilities, let's just try it? Well, I'm not an archaeologist, I'm a potter and my access to written documents was very much limited. So, I saw the problem only with the information which was accessible for me. And I think I used, like I say, common sense, that could be the right way to solve the problem. I was experimenting with the seawater and my idea was that seawater is a sort of colloidal suspension. So the happening physical, happening in the seawater could be similar to physical occurrence since in a solution with the clay, so I find the way by comparing these two things. Yes, we actually have a follow-up question for that from a fellow potter, saying:

The egg test that you demonstrated was very interesting. How did you come up with the idea for this test? This idea came, because when the colleagues, I know that they are producing soaps, they are usually using egg to measure the density of the solution with the floating egg and just by doing the experiment I find out that the egg in solution, which is suitable for the right density of terra sigillata is when the air is floating about one centimeter above the surface. And I do plenty of tests and when I saw this one, I thought it may be that also the potter in Roman times was using something practical, so that could be the egg maybe. Okay, great, thank you very much.

Actually, I'm just curious, as a sort of more general question to all of our speakers.

Do you also find that there are ideas that come to you because of the experience that you have with your particular technology, which should not necessarily...academically proven, shall we say, but just common sense, like Igor just mentioned. So for example, Claus, I know that you have some experience with farming and agricultural techniques. Are there some things that you just think, well, you know, this works, let's give it a try and do an official, shall we say experiment? I'm producing pottery now for more than 30 years. And, I was also in my young time, I was a scout. So maybe, this idea how to... I could imagine the situations in the Roman time I compare with my experience. So, that is also what leads my way of thinking about that, how to solve the problem. So yes, Claus...same question. Yeah, I mean, that's exactly what happens. Basically I always say, I first had to become... at least, a quite experienced medieval farmer in order to even understand what questions I could ask from a scientific point of view, and also from the practical experience looking at for example ridge and furrow excavations. I now understand the shape of the ridge and furrows more. Sometimes for example, they end in an s-shape manner and this comes from, or I instantly saw why I see that there are two, because with our practical experience, we go through to same as you have to turn around your team of oxen in an s-shaped manner, because the first two furrows are very, very steep curves you have to go and this makes this s-shape. And if I wouldn't have had this experience before, I would have never understood what I saw in the field again after. Okay, thank you. I have, I guess the same question I may as well ask all of you have...

Do you have, so for example, Ingrid, do you have a similar, any similar experiences of how something that you know from your weaving experience has influenced how you have done archaeological experiments? Yes, I tried to build a warp-weighted loom above layers of loom

weights, which have been found in excavations. This was my first idea to have an excavated layer of several loom weights. And, build a loom above them, and try to weave, and try to destroy the whole thing and to look how the loom weights fell down and will be preserved in the earth for further excavations. That was one approach and the other approach was my work in the archives of the natural history museum because there are so many differently shaped loom weights, and sometimes the hole is so small and sometimes they are so heavy and sometimes they are so small that the question arises 'what have they done?' and weaving..., for the weaving itself, you'll need sometimes an expert but you have to translate what a recent weaver tells you about the weaving process and you have to translate and transform it, for the warp-weighted loom.

Just on this theme, while we're waiting for some more questions to come through, Julia, I'm not going to ask about your experience with hemp production, but, do you have any other examples of how, I guess you sort of mentioned it earlier with the volunteers in terms of experiments being influenced by inspiration, but were there any other ideas coming from experience, more than, shall we say technical scientific experimentation? Well, my background is... I wouldn't call myself

proficient in any one technology, although my PhD..., experimental PhD at Exeter was on mentality, copper metality, but what I always found is that only through practice that a lot of questions properly come up. So even if something is well thought through theoretically, it's when you start doing it practically that some things don't work that you thought should be working or vice versa. And so there's, you know, I always say that you need to work with really experienced craft people. And this is why Düppel is also so great with the volunteer craft groups. So for the hemp experiments, I will be able to work together with the wool, textiles group in the field who have a lot of experience with hand spinning and also weaving because it is only through practice and experience that you can have or you can get meaningful results really. Okay, well, and I think that's actually a perfect note to end on for today. Oh, Kristen. Sorry. I see that you just wanted to say something. Yes, thank you. I just wanting to add something. I was lacking the vocabulary with the last answer. For clay pot irrigation, we rely on literary resources. So not archaeological sources and archaeological research is missing, in terms of the application of clay pot irrigation and of the ancient application as well as traditional application. You read in most of the papers... you read it's a traditional technology that has been applied all over the world, but basically there it ends. So we definitely need more research and archaeological research into clay pot irrigation. So thank you for the chance to add this.

There is a point raised by I think Natasha, that might've been skimmed over. **Could it be possible that you need more heavy weights for linen than for wool in weaving?** It may be directed at me (Jennifer) since that's what I sort of considered with my set of experiments. Basically this was one of the questions I asked myself, initially before I started doing any experiments whatsoever, because I was confronted with so much literature saying that heavy loom weights weren't loom weights, that they were for weighing down thatch in roundhouses, sometimes used to prop open doors that might be heavy. And so the weights comparatively weren't loom weights, but door weights that needed to be heavy to keep doors open. But what I found from this weaving experience is that the mass almost doesn't matter in the way that it's been discussed previously. So linen can tolerate approximately twice the amount of tension that wool can, before it snaps. So if you, if you look at the gauge of the yarn and you compare wool versus linen, then whatever the tensile break strengths point is for wool you could say generally that flax is double that. So with the [...] experiments, they only considered wool. And so one of my initial thoughts was to consider heavy loom weights and flax or linen weaving. But with my wool experiment, I've been able to show that tension from heavy loom weights is actually not a closed book, that there are more parameters that we need to explore with the tensile strength of these various masses of loom weights. So I can't say that linen and heavy loom weights go hand in hand, that if you find heavy loom weights, then you can assume linen was being woven because I could also do that with the wool. So I just wanted to clarify that question.