

CERAMIC TECH CHAT

Episode 66

Title – “Uncovering ceramic adoption in ancient cultures: Fumie Iizuka”

INTRO

McDonald: “I’m Lisa McDonald, and this is Ceramic Tech Chat.

Archeology may be the study of our past, but we are using increasingly futuristic techniques and technologies to reveal these long-ago cultures.”

Iizuka: “Archeology, it’s a multidisciplinary field. By working with materials scientists and conservation scientists and a variety of techniques, we can expand looking at the technology, interpreting human behavior, combining those aspects to make interpretation out of this micro-detailed materials analysis.”

McDonald: “That’s Fumie Iizuka, assistant professor of anthropology at the University of Wisconsin–Madison. Fumie is an archaeologist who studies the climate and ecosystem factors that led hunter-gatherers and early farmers to adopt pottery, with a focus on Eastern Eurasia. She served as chair of the Art, Archaeology & Conservation Science Division of ACerS, or AACS, in 2024–2025 and remains an active participant in the Division’s activities.

In today’s episode, Fumie will share her journey to studying the relationship between pottery and ancient cultures, describe some of the techniques she uses in the field, and discuss how being a member of ACerS has benefitted her research.”

(music)

SECTION 1

Iizuka: “So, I am an archeologist who’s studying ceramics, and ceramics from the past. And I got my undergraduate degree in anthropology, mainly focusing on archeological aspects at the University of Michigan.

Before that, I went to a fine arts high school. In Japan, they have kind of like a classical education, like in 19th century Europe. So, we had to learn the 19th century techniques to draw and paint and all these things. And I appreciate that today, in some ways, but I was interested in cave paintings of the Pleistocene or Ice Age Europe. So, I wanted to see more of the time covered by archeologists. And I was also into South American, pre-Columbian art and Mesoamerican art. So, I was interested in something related to artsy things in the past. And that was kind of a vague beginning I had.

And then, at the University of Michigan, I received sort of the broad anthropological, archeological education, and I went into the Japan Peace Corps after that. I was working in Nicaragua at the cultural institute there. I had to do cultural resource management there and also surveys, and that involved a lot of collection of ceramics from Nicaragua.

And there, I also bumped into an archeologist with a Ph.D. from the United States who was a very skilled person in analyzing archeological materials and interpreting about human behaviors or change in human societies. And we worked on a project to analyze ceramics and then interpret what was going on in the past in Nicaragua. Working with this person was fascinating, and he was also into studying early part of the ceramic period in Latin America in general. So, I sort of had that in mind, 'Oh yeah, that's what he does, and the time period sounds interesting.'

And then after that, I went to UC Santa Barbara for my master's degree. And there I met with an emeritus professor who encouraged me to write a paper on what ceramics can do for archeologists, to reconstruct human behaviors in the past. And she was a hunter-gatherer time period expert and had been working in lowland Chiapas, Mexico, for the entire career. And after I took an independent course with her, she took me to her field site in Chiapas, and that was like shell midden created by hunter-gatherers. That particular site where we excavated did not have pottery, but at Santa Barbara, I got to take a course on hunter-gatherer behaviors, which made me write papers on hunter-gatherers at shell middens with pottery. So, things were connecting with each other.

McDonald: "That's really exciting."

Iizuka: "Yeah. So, after that, I went to the University of Arizona for my Ph.D., and Arizona was a primary place to go for ceramic archeology. There, the field called archaeometry was being incorporated substantially. So, I got the best kind of education available at that time.

For my dissertation, I went to study this early ceramic-bearing shell middens in southern part of Central America, in the Republic of Panama. The earliest ceramic dates begin around 5,500 years ago, I think, and pots are found not at shell middens but also in interior sites. Sort of like Pacific foothills to somewhat higher elevation sites and on the Caribbean slope.

So, what I was doing for my dissertation was to uncover the entire region with Monagrillo-type ceramics and reconstructing human behaviors and the variability. So, studying the raw material procurement patterns, manufacturing, the firing techniques, and the post-depositional alteration processes.

Panama has this institution, that Smithsonian institution, with scientists working on everything about hot and humid tropics. Geology was one of the divisions there, and I worked with geologists to do the raw material collections. I gathered not just clays but also like rock fragments, and then I thin sectioned raw materials that I gathered and then compared with thin sections of pottery.

So, that was the phase during my dissertation, and then another aspect important for archeologists studying ceramics or technology is that we have to know the theory. So, technology theory was a big part of my education in Arizona, and at that time when I was there, we were very lucky to have theoreticians from every field of technology theory.

Another field is called behavioral archeology. It's about reconstructing production steps and thinking of technology as having like a contextual intended function of producers. So, how producers were thinking of making, in my case pottery, to be basically useful for their own subsistence practices or like mobility routine.

These aspects, basically the scientific methods and also archeological fieldwork and technology theory, they were being combined at around the time I was a Ph.D. student."

McDonald: "It is just fascinating to hear how many different disciplines have to be tapped to analyze things in anthropology and archaeology. You really are detectives because you can't just go and ask these people what they were thinking. So, you have to find other ways to really put yourself in their shoes and maybe understand if they had that mindset, how that influenced the artifacts and the samples that you're finding and analyzing."

Iizuka: "Yes. I finished my doctoral dissertation in 2013 and graduated. I was working for a long time writing grant proposals and having like a research affiliation and also as an adjunct faculty of different universities. So, teaching a variety of courses, including some involving ceramics. So now, I'm an assistant professor in the Department of Anthropology at the University of Wisconsin-Madison.

As we all know, the job market is very competitive, and it's not easy to find jobs. I was lucky to get this job because one of the aspects they wanted was somebody who can do archeological science, and archaeometry was one of the main interests they had. And also, they were interested in this foraging to farming period transition. Of course, when we apply, we don't know what exactly the search committee is looking for. But I happened to probably fit well as a candidate."

(music)

SECTION 2

McDonald: "You focus a lot on ceramic transition periods. So, can you tell us a little bit about what is meant by the transition period with ceramics?"

Iizuka: "So, in archaeology, technological change or behavioral change and interpreting why societies change, that's very important. It's almost why archaeology exists, is to understand why change happens.

So, in my case, I am interested in the period of pre-ceramic: period when ceramics didn't exist to the period when ceramics appeared. And archeologically speaking, ceramics were time consuming. Basically, to make pots, you had to be more sedentary or stationary for

some days. They have to gather fuels, and they have to fire. And also, ceramics are costly because if they transport, they break easily. And they're heavy, too. So, if people were mobile, I'm interested in what was causing them to adopt pottery.

Was it because the climate ameliorated or because climate deteriorated that foragers had to do something about the food that's available? For example, food scarcity is related to change in vegetation. So, if the climate changes, the vegetation changes occur also. And then, faunal change would happen. So, animal communities change, associated with the vegetation change. And also, if there are certain natural disasters such as volcanic eruptions, that may lead to some kind of a decision for foragers. So, certain places may not be ideal to occupy for a while. So, basically, I am thinking of kind of contextual changes that affect hunter-gatherer living places and the decisions of foragers to begin making pottery.

In the context that I'm currently studying in southern Japan, the early ceramics are potentially associated with terminal Ice Age sea level rise. Ceramics seem to appear with other technologies, such as adoption of arrowheads or adoption of ground stone axes or use of grinding stones. So, I'm just considering environmental aspects and other technologies that are being adopted and trying to explain the transitions to the ceramic vessel-using period."

McDonald: "So, I know you mentioned that these types of ceramic usage period studies are still a newer, growing piece of the literature when it comes to Eastern Eurasia, where you specialize. So, can you tell us a little bit about your current project, how you got involved with it, and what specifically it's looking to answer?"

Iizuka: "So, after my dissertation period, I bumped into a group of archeologists working in Japan or eastern side of Eurasia, and they had access to early ceramics of Eastern Eurasia. So, I started working there, and now I have a main project in Japan, especially in the southern part of Japan, but I also have a comparative project as part of a bigger group project in northern Japan and also in Mongolia.

So, I explained a little bit about the Ice Age pottery in southern part of Japan. The period before pottery was the period called the Oldest Dryas. So, it was prior to 14,700 years ago in the colder conditions. And then the next period was called Bølling-Allerød, warmer period. And that's when pottery appeared with grindstones and arrowheads, which means like use of archery now. And also, the pit houses started to emerge during that period. So, something related to probably the mobile foraging to more sedentary foraging occurred with the use of forest resources because the condition during the Bølling-Allerød is considered to be denser environments, rich in trees.

I currently excavate on an island called Tanegashima Island, and there, we are collaborating with an ocean scientist who is reconstructing the timing of sea level rise on the island. And my initial assumption was that the sea level rise and disconnection of this Tanegashima Island from the bigger island of Kyushu, that was like a major stress for foragers, so they had to change their behaviors. But we're kind of seeing different pictures

now from our research, and this is going to be answered relatively soon in a more precise way.”

McDonald: “Well, that is really exciting. I’m sure our listeners are going to look forward to seeing some of those results once they’re ready to be published. So, I think like some of these things that you’ve mentioned and talked about, it’s not just the sociological aspect, you also have to have this awareness of highly advanced materials characterization techniques. Can you tell us a little bit about how you find out about the time frames of the artifacts and the samples that you’re finding and analyzing?”

Iizuka: “So, archaeologists have to be sort of aware that we cannot directly take dates provided; we have to know the context, depositional context. So, one way to reconstruct the time period of the past with ceramics is TL dating. It’s thermoluminescence dating. So, they will get the last time of when pottery was being heated; that’s when they can reconstruct dates from that. But if we cannot use TL dating, for example, when we have access to museum collections that we cannot destroy, then we have to take other paths.

So, AMS [accelerator mass spectrometry] radiocarbon dating technique is currently the most important technique I adopt. And what we do is that when we dig, we record from where charcoals were being collected, and then we match the charcoals that closely associate with ceramics from the time period. I’m being lucky to collaborate with this lab at the University of Tokyo, which has probably the best resolution in the world right now in getting the dates with the AMS technique.”

(music)

BREAK

McDonald: “The American Ceramic Society’s Art, Archaeology & Conservation Science Division aims to advance the scientific understanding of materials found in ceramic art and to provide information that aids in the interpretation and preservation of traditional ceramic art and artifacts. Learn more about this Division at www.ceramics.org/aacs.”

SECTION 3

McDonald: “When along your journey did you become aware of like, ‘Oh, there’s The American Ceramic Society’ and become involved as a member?”

Iizuka: “So, my colleague from the University of Arizona in materials science was involved with ACerS. And she’s like, ‘It’ll be a good idea for AACCS [Art, Archaeology & Conservation Science Division] to have archaeologists who work on technology or archaeometric aspects.’ So, I kind of got involved in 2021 through her.”

McDonald: “Because we all needed new hobbies during the pandemic, right?”

Lizuka: “Right! It was good, though. It was a new hobby to get to know people involved with ACerS. A geologist, a materials scientist, a conservation scientist.”

McDonald: “So, what has been do you think your favorite part of getting to know the ACerS community?”

Lizuka: “Oh, they have access to very effective instruments, for example. If I work only within archeology, I would have access to instruments that are more commonly used within the archeology field. But through ACerS, I get to know all kinds. Like conservation scientists have tricks to not spend a lot of money but to identify materials. And I really enjoy discussing about effective methods for materials characterization. So, this is one great aspect. And also, when I moved to UW Madison, I had to quickly set up a lab. And to get the most useful instruments that are not going to be high maintenance, it was great to discuss the potentials with the ACerS members. So, these are things I really like.”

McDonald: “It really is great when you can branch out of just your own discipline and realize, ‘Oh, there’s something that’s happening over in this other discipline that would be super helpful in mine.’

So, I know you’ve had so many experiences, you’ve literally traveled around the world doing your research. Are there any specific experiences that you’ve had that really resonate or like stand out strongly in your mind? And that can either be because it was very serendipitous, and it was like, ‘Wow, this was a big discovery I stumbled on.’ Or alternatively, maybe it was a mishap, but from that mishap you’ve learned something very important that helped guide you on your future direction. So, do you have a story along those lines that you think would be inspiring for our listeners?”

Lizuka: “From my experience, during the dissertation, I was incorporating those technology theories, especially the behavioral archeological theory, and studying the production steps of the earliest pottery in central Panama. And at that time, I was interested in how each biome, like environmental zones, affected producer decisions.

And it turned out that the lowland producers did not make pottery that was as impact resistant as potters who made pots in the Pacific slope area. And also, pottery that was used on the Caribbean side, it was a highly weathering condition with like heavy rain; it’s almost always wet on the Caribbean side. So, reconstructed technology, like harder, potentially higher fired materials, were used in this rugged terrain in the wet condition. So, they were weathering and impact resistant, and my interpretation at least was that was in the mind of the producers. And then the lowland had thicker vessel walls and less impact resistance. So, these [findings] were an interesting surprise for me, combining like these archaeometric techniques and archeological theory or technology theory. So, that was my discovery or the surprise I had.

And other aspects, like today, because I study the first ceramic adoption period in East Asia, I see like a different decision made by the first producers. It’s good to have not just a regional knowledge, but I think to know completely different, probably unrelated adoption

contexts. Even though they were both having hunting and gathering within their lifeways, but pre-ceramic period makers made different decisions because the technologies are distinct. Even though, I have to say like in Central America, or southern Central America where I studied pots, they were farmers as well. Like the broad spectrum food was being made by people.”

McDonald: “That is just a great story to really show like, it’s just so fascinating when you kind of have these people over here, these people over there, and how growing up near similar time frames, but because of their local climate and access to things, their paths kind of diverged in how they evolved. It’s so fascinating.”

Iizuka: “Right, right. Anyways, I’m looking forward to putting together some of my research results and making archeological interpretations.”

(music)

CONCLUSION

McDonald: “By learning more about how humans responded to climate changes in the past, we may be inspired to reflect on how we will face the changing climate today.”

I’m Lisa McDonald, and this is Ceramic Tech Chat.”

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“Visit our website at ceramics.org for this episode’s show notes and to learn more about Fumie and her research. Ceramic Tech Chat is produced by Lisa McDonald and copyrighted by The American Ceramic Society.

Until next time, I’m Lisa McDonald, and thank you for joining us.”