

CERAMIC TECH CHAT

Episode 45

Title – “Clay roof tiles inspire past and present passion: David Jensen”

INTRO

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

Members of The American Ceramic Society will recognize Edward Orton Jr. as one of the founding members of the Society who helped pioneer an analytical approach to ceramic research and development. But few may realize that he helped launch another famous organization at The Ohio State University.”

Jensen: “In addition to his involvement with ceramics, I recently learned that he also had been the founder of what is now The Ohio State Marching Band. So, to anyone who’s an Ohio State football fan, anytime you see them come out on the field, you can thank Edward Orton Jr.”

McDonald: “That’s David Jensen, sample coordinator and glaze production scheduler at Ludowici Roof Tile in New Lexington, Ohio. After joining Ludowici, David became the company’s de facto historian, and his research led to a surprise discovery of more than 800 glass slides created by Edward Orton Jr. kept in ACerS storage that provides a look at the ceramics industry in the early 1900s.

In today’s episode, David will share more about his work at Ludowici as well as the ongoing project to digitize the Orton glass slides collection and make them publicly available through the Columbus Metropolitan Library.”

(music)

SECTION 1

Jensen: “I didn’t actually plan on studying ceramics originally. It really, well, it was a combination of factors. I knew I wanted to be an engineer of some kind when I was in high school, and so I looked at a variety of schools around New York that have really good engineering programs. I visited a few different campuses, and the first campus where I saw anybody who actually looked happy to be there was Alfred University.

As I’m sure you and a lot of listeners would know, Alfred has a really great ceramic engineering program. So after I got there, I went as an undecided engineer, and I decided I’d aim for an engineering program that I knew was a strong program and had really good teachers, really good graduates. And the Ceramics College, it was a great candidate. So that’s what I went with, and I’ve been working with ceramics ever since.”

McDonald: “So what type of ceramics were you studying while you were in college?”

Jensen: “Well, it was really all encompassing. It was a wide variety. And let’s see, I wrote my senior thesis on...we were researching alumina. We developed, I think, it was a calcium hexaluminate platelet within an alumina body. And it was really interesting. But one of the things I like about my current role compared to what I was studying in college is that I can actually explain what I’m doing to family members, and they understand it.”

McDonald: “That is always a bonus.”

Jensen: “Yeah, that’s a big advantage of working with something as simple as clay roofing tile. Because even if they may not understand the technical details of it, you can say ‘clay roof tile’ and people get an image in their head. Whereas if you say liquid-sintered alumina, they might not know what the heck you’re talking about.”

McDonald: “So speaking of the company you currently work with, Ludowici, was that something you transitioned to straight out of college? Or did you find your way there after a few other pit stops?”

Jensen: “No, I joined Ludowici right after I got out of college. It was the company that really jumped out to me when I was looking for jobs. Everything else was very, you know, somewhat technical, really interesting from a technical perspective. But when I saw Ludowici was looking, and I learned about the company and the reputation and what they make and what the job would entail, I mean it just sounded so exciting. I couldn’t really resist that.”

McDonald: “Can you share with us a little bit about that history you just talked about that made it so exciting and enticing for you?”

Jensen: “Yeah, sure, I’d be happy to. So, Ludowici has a long history. It’s really hard to pin exactly where it begins because it kind of branches. On the one hand, it starts in the 1850s in Germany, when Carl Ludowici founded a tile works in his town, and that tile works wound up growing into one of the largest in Germany. It grew so large, in fact, that in the 1890s they decided to branch out and license an American company to begin producing their tile. So that company grew fairly large.

And then separately in 1880s, the Celadon Terracotta Company was started in Alfred, New York, which ties in with the University. And that company wound up growing very, very large and very renowned for their quality of tile. And that company merged with the Ludowici Company of Chicago in 1906 to form Ludowici Celadon, which has grown into what is now just Ludowici.”

McDonald: “That’s impressive.”

Jensen: “So, one of the interesting things that really jumped out at me is that Ludowici’s history ties back in with Alfred University’s history as a clay school. It was really the presidents of the Celadon Company that led to the decision by New York State to start the College of Ceramics at Alfred. So in a way, the company that I work for now played a big role in starting the college that I loved going to. So I just thought that was a great connection.”

McDonald: “You were implicitly being trained for your future without realizing it.”

Jensen: “I was.”

McDonald: “So, what are some benefits of terracotta tiles compared to other materials that potentially be used for roofing a house?”

Jensen: “Well, the biggest benefit is longevity. I mean the most common roofing material used in the United States right now is asphalt shingle, and it’s popular because it’s fairly cheap and it looks decent. But the thing is, most asphalt shingle roofs, you’d be lucky if they last you 20 years or so. Whereas a terracotta tile roof, we can guarantee you that the material is going to last at least 75 years. And frankly, in many cases, we see them last a century or longer.

Usually, if a terracotta roof needs to be replaced, it’s not the tiles that have failed, it’s the underlayment beneath it that’s failed. So you need to remove the tile, you can rebuild the underlayment, and then in some cases, if your roofer knows how to remove them correctly, they can put the same tile right back on the roof and it’ll last you another 100 years. When we call it an heirloom roof, we call it that because it’s something where you’re gonna pass it on to whoever has the house next.”

McDonald: “That is a very valuable heirloom. One that is so useful and can be passed through probably multiple generations.”

Jensen: “Yeah, it’s certainly...I find it comforting to think about as I design glazes and design colors for our projects. Because anytime I make something unique, it’s comforting to think that anytime I’m making a roof tile, it’s gonna outlast me. These glazes, these colors, they’re durable. They’re going to endure longer than I will. So that’s kind of a comforting thought in some ways. A little bit frightening in others, but it makes me want to make sure I’m getting it right.”

McDonald: “So, for someone who isn’t involved in the materials science realm, what’s something you might tell them about the terracotta roof tiles that might be surprising or like a fun fact for them to know?”

Jensen: “Well, I guess one of the things that has surprised me learning about it is just the sheer variety of roof tiles and options that are available. I had always pictured it being mission tile or Spanish tile or something fairly simple like that. But since coming to work here, I’ve come to realize just how much roof tile is everywhere. I guess part of the appeal of

clay and terracotta is it's a chameleon of materials. You can make it look like anything. You can make it be any shape, any color.

So that kind of cuts both ways. It means that it can look like anything, but it makes it a lot harder to identify when you see it. We have tile that's on skyscrapers that you'd never recognize as being clay from the ground because it's coated with gold. So you look at it and you think, 'Oh, that's gold,' and you'd never think that it's clay underneath. So I guess I'd just say that roof tile can look like anything. It can be incredibly varied in appearance and texture."

McDonald: "I think that'll probably send quite a few of our listeners to go reevaluate the roofing tiles they see around them. Because, like you said, you just picture the traditional terracotta so often that you don't realize how widely it's being used and in what ways it's being used in current society."

Jensen: "Yeah. I can say that since I've started working here, I've been noticing roof tiles everywhere. The last time I went back to Alfred, I was amazed because if you've ever been to Alfred, you might notice a little bit of roof tile, but once you start looking for it, you realize just how common it is in that town and how many buildings feature these historic roof tiles that have been there for 100 years or more."

(music)

SECTION 2

McDonald: "Can you tell us some more about the job that you do at Ludowici? Like what sector of the company and the research that you do."

Jensen: "Well, I find it really interesting because it's a fairly small company considering the range of territory that we operate on and the reputation we have. But I really like my role because it allows me to work with pretty much anyone here.

I work at our factory, but my role is to both develop our glazes and to maintain them. So that means that I oversee the daily production of them, do our quality maintenance on them, I adjust them, I add stains, add oxides as needed to maintain the colors, get them where they need to be. But at the same time, I also find myself working with architects, working with our customers, working with people trying to develop the colors that they want to have on their final projects.

So, I really enjoy just the wide variety of tasks because sometimes I'm just here at the factory working on factory responsibilities, the next day I might be flying to a project site to work with an architect to develop colors for a multimillion-dollar building they're working on. So, I just really like that variety of it."

McDonald: "It's so nice when you have a job that allows you to do a ton of different things that never becomes repetitive."

Jensen: “Exactly, yeah.”

McDonald: “So, what is it like getting to go on site, work with architects? What are some of the considerations that they challenge you with when you’re going back and developing these glazes for them?”

Jensen: “Well, I’d say it’s different every single time. It really depends on the project that I’m working on. If I find myself involved with a restoration project, we’ll usually first want to start by looking at what was there originally. And you can’t just go off that alone because if it’s being replaced, it typically has some sort of a significant flaw, or it usually provides good reason for it to be replaced. So, you may not want it to look the same as it does now.

Other times you wanna match the tile exactly as it’s always looked but get the benefit of having a new clay body underneath so that it has enhanced durability, strength, the features that you’d want from a new roof. So, the first thing I want to do is in that case, I’ll want to look at what’s there. If I can, I’ll want to get samples, I’ll want to read them with a color meter, find the L*a*b* values associated with that, and then either find an existing glaze that works very close that can get me a color like that or develop a new one that would get me to where I need to be.

If I’m working with an architect, I guess one thing I like to do is I like to try to talk with them to figure out what their vision for the project is. Because color is a very subjective thing, in that every architect will have an idea of what they want, but they’ll always have a different way of communicating that. So, if I can, I like to try to see a physical reference for what they’re aiming for, or I like to see images of the kind of roofs they want to match. I like to just work with them, talk with them, and try to figure out a way to meet the final goal that they’re aiming for.”

McDonald: “Since you work with architects and companies that are spread over such a large geographic area, you probably are having to design glazes that can work in a variety of climates. Is that ever a challenge for you, having something like a very rainy climate, or very hot climate, and how that influences the type of glazes you’re able to use?”

Jensen: “Any glaze that we designed for a roof would hold up in any environment. So that’s not really very much of an issue for us in terms of developing them. I’d say the thing that really varies depending on the area is the style that people might be aiming for. You think of an area like Florida, you’ll find a lot more Spanish and mission tile in use. You know, the tile that everyone thinks of when they picture a terracotta tile. Whereas if we’re working on a roof somewhere in, I don’t know, New York or a different area, you might find these English style shingle tiles or flat interlocking tiles.

It’s just different regions have different associated colors, different associated textures that people really tend to steer towards a lot more often. So, we’ll find different colors are more popular. But frankly, in terms of quality, we don’t really run into any issues with that. It’s more just that people prefer different things in different regions.”

McDonald: “Which is why it makes it so much fun to get to go traveling to the work sites when you do because you get to see so many different things.”

Jensen: “Yeah, yeah, one of the things I really enjoy is when I get to see an older building that has an older style of tile. Because since I’ve been with this company, I’ve dug into the history of terracotta tile manufacture in the United States. And it’s amazing because there had been so many different companies in the United States that had made these kinds of tiles, and sometimes not even companies, just small operations where it would be someone literally making it in their backyard. But nowadays it’s really limited to very few companies, and I’m happy that we’re one of the few ones that can make them at the quality that had once been very common. We can make that wide of variety of tile.

But I always find it amazing just to see the things that were made by our former competitors because every one of them had brought something different to the table, and everyone had had a unique style or something that made their tile distinct. So, it’s always really interesting to try to see those tiles and then see maybe the results of how they were fired, the different patterns that they made, the different manufacturing processes that they used. I just find it amazing to look at them, and bear in mind the context of how they had to be made.”

McDonald: “And as we’ve seen like with, say, Roman concrete or some of the Mayan plasters, looking back at what people produced previously, you can learn so much and adopt some of those techniques moving forward to make it even better.”

Jensen: “Yeah, yeah. I mean, we’re somewhat limited with clay tile because historically, they were frequently coal fired. And for obvious reasons, we’re not going back to firing our tile inside of an old beehive kiln, thank goodness. But yeah, we found a lot of ways to try to imitate some of the effects of coal firing, try to imitate the visual look that that would result in without having any of the negative environmental effects or safety risks for our workers. But I always find it really interesting just to study the different effects that would have occurred and try to understand what caused them. So, I can see how it might give me a better understanding of how to match that if we want to do that for a certain job.”

McDonald: “Yes, definitely. So, I know we mentioned the words like glazes, engobes, coatings, I guess. Can you give me a little bit of a rundown of the differences between those different things that you’re creating to put on top of the tiles?”

Jensen: “Yeah, and I’ll try to keep it fairly simple. But the basics are that a glaze is a glassy coating that you apply to the outside of a clay body. When you picture something like a plate or a coffee mug, they’ll typically have a glaze on the outside, which is what gives them that shiny, glassy look over top of the clay underneath. Whereas an engobe, it’s a clay slurry that you use to coat the clay body. So sometimes this can be harder to see, especially on a roof tile or something from a distance because it really will just look like the clay body itself. That’s why we tend to use them in our tile because that way we can

maintain our consistent clay body and its durability. But we can achieve the look of different clay bodies over top of that.”

McDonald: “That’s really useful to have that in your tool kit.”

Jensen: “Yeah, it’s very handy because the firing temperature would be the main thing that you could vary that would adjust how your clay body would look. But the risk that carries is if you fire at a lower temperature and your clay body may be somewhat porous when you fire then, so you’d find that something like a roof tile wouldn’t be as durable. It might soak up water. If you’re in an area with freeze–thaw cycles, then it might soak up that water and fail after a few of those cycles. So it’s really important that we maintain that clay body. But an engobe allows us to have a nice variety of appearances we can achieve on the outside while maintaining the durability within the clay body itself.”

McDonald: “That’s really great, especially with weather becoming sometimes more erratic and different than it was in certain areas before, where you’re having to take into account freeze–thaw cycles that may be different parts when the tile was originally created there, it didn’t have to withstand.”

Jensen: “Yeah, it’s definitely a benefit in certain areas. Some of our markets have been changing a bit because we’ve been getting demand in areas where historically we hadn’t had it. Not so much for freeze–thaw as I believe wildfire risk is one that’s been making a lot of people consider clay tile. Because something like asphalt shingle or wood shake really won’t provide you much protection at all from a fire, whereas terracotta tile, I mean, it’s already been through the fire, so it’s fireproof by that point.”

McDonald: “Yes, it is. This question is maybe a little bit outside the normal, if you know, but rooftop solar panels are becoming a lot more of a common thing. How does that work with the terracotta? Are you still able, on top of those types of tiles, to mount solar panels on your roof?”

Jensen: “People are able to. It hasn’t come up on many projects that we’ve been involved with. However, I know that some of our colleagues in Europe have tiles that are designed in a way that you can set a solar panel on top of it, and not affix it to the tile, but have the tile provide a gap for its support structure to go through. Really just work with the solar panel instead of trying to fight against it or something. So I know in Europe there have been significant developments in making tiles a bit more friendly to installing rooftop solar panels. But within the U.S., we haven’t done as much to develop in that way.”

McDonald: “But that’s really great that it’s been happening over in Europe. And so if that demand starts coming in North America, you’ll be able to take what they’ve learned over there and apply it to your projects are taking place here.”

Jensen: “Yeah, there’s definitely a lot of overlap between the products that they make, that they apply that to and the products that we make. So if that came up on a project, it could be something that we could easily apply.”

McDonald: “So, during your time working at Ludowici, are there any projects that stand out to you as like serendipitous experiences or, on the other hand, very funny experiences that just stick in your brain?”

Jensen: “Well, I don’t know if it would count as a single experience, but I guess the one memory that really jumps out to me is, I’ve come to realize when I was really young, one of the things that I always, I guess my first encounter with engineering of a sort was playing in the stream near my house and trying to play in the mud and build a dam out of the water. Me and my brother, we had this goal of trying to force all of the water in this stream into a narrow pipe that I think had a diameter of about two inches. So, in retrospect, it was a pretty unrealistic goal, and we never achieved it. But now I have to laugh because, after all this time and all this time studying in college and working, I’ve come all this way only to find that once again I’m still playing with mud.”

McDonald: “Sometimes you just can’t get away from it. It follows you.”

Jensen: “You can only do so much.”

McDonald: “That’s really a great story. And it is fun sometimes when you reflect back and you’re able to see how much your life has changed, but in other ways it really just stays the same.”

(music)

BREAK

McDonald: “*The American Ceramic Society Bulletin* has served as the archival record of the Society for more than 100 years. ACerS members can access all past *Bulletin* volumes through the fully indexed digital database Bulletin Archive Online. Learn more about BAO and dive into the Society’s history at www.ceramics.org/bulletinarchive.”

SECTION 3

McDonald: “You know so much about the history of Ludowici. I would love to learn like how is it that you came to know so much about the history of your company?”

Jensen: “Well, I didn’t know very much about the company’s history when I joined. I knew enough to make me be interested in it, and I knew a little bit about the connections to Alfred. But once I got here, I found I wanted to learn more. And the more I looked into what we had, the more gaps I found, the more I got to wondering other questions.

So with one thing and another, I wound up doing a lot of research of my own and trying to fill in those gaps, understand what happened when, and what developments led to what. And, over time, I really just came to be referred to informally as the company historian.”

McDonald: "As the company historian, you've actually gotten to have a very interesting project going on through The American Ceramic Society with our old Orton glass slide collection. So can you tell us a little bit how that came about and how you discovered it?"

Jensen: "Yeah. That was a bit of a surprise to me. I had been looking through a book on the Centennial of The American Ceramic Society, and it was a very interesting publication. And on one page an image jumped out to me because I recognized this photo of our company's former tile plant in Chicago, and the only other time I had seen this very photo was in a book published in 1910 that had contained many other photos of our other tile plants from that time.

So immediately when I saw it, I thought, 'Oh, my goodness! I have to find out where they have this photo and how they have this higher resolution version of it because I'd love to digitize it if I can.' So I looked in the back of the book and it listed that particular photo as being property of The American Ceramic Society. So after I learned that, I contacted the Society, I reached out and asked if we'd be able to view or digitize any of the images.

And after going and viewing them, we realized it wasn't just one or two photos. It was a collection of around 800 photos that Edward Orton, Jr. had taken during his time as secretary for the Society."

McDonald: "That is like you just saw the tip of the iceberg, and then once you started digging, it was an entire treasure trove underneath."

Jensen: "I know, I was blown away. It was amazing to see."

McDonald: "Once you realized there were 800 of them, trying to digitize and archive all of that on your own would be very difficult. So, how are you going about trying to do that project?"

Jensen: "Well, luckily, that's a project that I've been able to find a lot of help with. Once I realized there were so many photos, I mean, obviously, if they were just a few of them, it could have been something our company might have been able to justify and say, 'Okay, these are a few photos of our company's history. We'd be willing to pay to have them digitize.' But when it comes to 800 photos that are all dating to the early 1900s, you want to take a certain amount of care and handling them and making sure that you're preserving them in an archivally sensitive way.

So once I realized there were so many, I reached out to a few archives around the Columbus area and asked them if they could refer me to any services that were good for digitizing archival material that would be prepared to handle this type of glass slide. And one of them put me in touch with the Columbus Metropolitan Library. So I reached out to them, and they not only offered to help digitize them, they offered to help digitize them for free and make them publicly accessible as part of a Columbus area history project."

McDonald: "That was just wonderful. So that means anyone would be able to go online now and start seeing the ones that have been digitized so far?"

Jensen: "Yes. And they're working through them bit by bit. Last time I checked, they had only gotten through a small fraction of the 800 photos total. But still, they've been doing a phenomenal job of digitizing them, capturing incredible detail in these, making sure that they have the correct meta metadata to provide context for all these photos. And it's just amazing to look at them. They really do a great job of capturing the industry as it was at that time."

McDonald: "And as we talked about before, it's so important to remember where the industry was so that way we can go forward into the future, learning from the past techniques, past people. It was such a great finding that you're able to realize that we have this hiding in the background of our storage units."

Jensen: "Yeah. I have to say, that's part of what has blown me away about this. Edward Orton, Jr. did a great job of capturing the entire ceramic industry as it was at that time. To the best of my knowledge, he likely used a lot of these as lecture slides during his presentations as a professor at Ohio State at that time. And these photos just do an incredible job of capturing every variety of ceramic industry that existed then. So, he traveled to potteries, he traveled to, weirdly enough, a lot of sewer pipe companies, roof tile companies, floor tile, every clay industry that existed then. And he documented every aspect of their production that he deemed relevant.

I can't tell you how many photos he's gotten of shale banks just showing the big pile of shale and documenting, 'Oh, I like this section of the shale bank. I don't like this section of the shale bank.' It's great commentary, and it's incredible just to see how thorough he was in analyzing this and documenting the production, their manufacturing, their storage techniques. It's just great to see."

McDonald: "And you know you've got a true scientist on your hands when they can look at a picture of a shale pile and say, 'This part's good, but not that part.'"

Jensen: "Yeah, he certainly had strong opinions on shale."

McDonald: "So, is the Orton project, when you discovered this picture, you got in contact, is this your first time learning about, knowing about The American Ceramic Society?"

Jensen: "No, I'd known of The American Ceramic Society since my time at Alfred. However, I was involved in so many clubs and so many organizations on campus, I didn't really have the time to be involved as much as I would have liked. But since graduating, I really learned a lot more about it and was excited to kind of become more involved, renew my membership, become more engaged in the organization than I had been prior."

McDonald: "So, besides the Orton project, I guess how else has The American Ceramic Society helped you personally and professionally?"

Jensen: “Well, I’d say the biggest benefit has just been in terms of professional networking. I mean, it’s a great way to meet other ceramic engineers in the area. It’s just a great way to meet like-minded people who understand the material and understand, I guess, the semi-obscurity of ceramics. It’s definitely a niche field, so it’s neat to meet others who kind of work within that and have their own areas of focus but all have that same sort of shared goal of getting a better understanding of the possibilities of what we can achieve with ceramics.”

McDonald: “And that’s one reason that I’ve been at The American Ceramic Society for five years myself now, and just getting to work with members and seeing those tight connections and not just collaborations but friendships that grow out of it. It’s really great that we’re able to provide this network for such a niche field.”

Jensen: “Yeah, I sure appreciate it.”

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CONCLUSION

McDonald: “One hundred and twenty-five years after the Society’s founding, Edward Orton Jr. is still finding ways to inspire the current generation of ceramic engineers and scientists.

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 David Jensen, Ludowici, and how to access the Orton glass slides collection. 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.”