RioTinto

Transcript

# Things You Can’t Live Without

## Episode 4 – Shelley Roden’s Trash

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**Dr Anna Ploszajski** [00:05]
From the moment we're born, we accumulate stuff. Some of it comes into our lives briefly some of it we hold on to for years because we want it or need it or just absolutely love it. But of course, all of this stuff has an impact on our planet. On Things You Can't Live Without, I, material scientist, Dr Anna Ploszajski ask a guest each episode to tell us the one thing they can't live without. And we interrogate a host of experts to find out the true impact of our obsessions. Joining me today is an award winning Foley artist who has performed sound effects for over 200 live action and animated films and TV series, including Black Panther, Disney's Encanto and Glass Onion: A Knives Out Mystery, and her name is Shelly Roden. Welcome, Shelley.

**Shelley Roden** [00:52]
Hi, Anna. I'm so happy to be here talking with you all.

**Dr Anna Ploszajski** [00:55]
I'm so excited too. So tell us, what is the one thing that you can't live without?

**Shelley Roden** [01:02]
As a Foley artist, I cannot live without other people's trash.

**Dr Anna Ploszajski** [01:06]
Right, okay. So other people's trash. Now, this is not an item that I expect many listeners will be able to directly relate to, but we'll be digging a little bit deeper into that in just a second. Today, we're also joined by Saskia Duyvesteyn, Chief Adviser for R&D in Copper at Rio Tinto, who will be taking us through the science and engineering of the stuff that we often don't like to think about, which is waste. So welcome, Saskia.

**Saskia Duyvesteyn** [01:31]
Anna, it's so great to be here today to get to talk about one of my favourite topics on how can we actually reuse waste?

**Dr Anna Ploszajski** [01:38]
Yes, I'm so excited to get to that. But first, Shelley, tell us more. Why can't you live without other people's trash?

**Shelley Roden** [01:47]
My daily life is spent walking in sync with imaginary characters, and creating the sounds of the objects they're handling on the screen. So I need to collect all these objects. And the way we do that it was we go to thrift stores, we keep an eye out for things left on the street. We go to salvage yards and collect anything from everyday objects, such as tea cups and saucers to odd objects

that are thrown away like old beat up car doors, or car hoods, and anything that can create a sound that will convey that what you're watching on the screen is real. And I can share some of my favourites with you. But we'll get to that.

**Dr Anna Ploszajski** [02:34]
So what does a typical day look like for you?

**Shelley Roden** [02:36]
I work on a stage, a Foley stage, that is similar to working in a music studio. So I'm the performer, I'm the musician, working on one side of soundproof glass. And there is a engineer on the other side, sitting in a mixing console, recording and mixing from all the microphones on our Foley stage. And myself and my partner work as Foley artists performing live in sync to what you see on the screen. We have a gigantic movie theatre sized screen that we can see all the detail, all the texture, all the action, so that we can perform it like mimes, or dancers, or musicians. We are all the above and I need items that, like I said, range from old ironing boards, old rusty ironing boards, to pine cones. I mean, if you can imagine in your everyday life, we have that on the stage. It's a yard sale, gone crazy on our stage.

**Dr Anna Ploszajski** [03:38]
That's incredible. I'd never heard of this before we started talking. So we're talking about like footsteps and clinking glasses, you know, all the kind of sound effects basically that are nonverbal in the movie, is that it?

**Shelley Roden** [03:53]
Exactly.

**Dr Anna Ploszajski** [03:54]
So why can't they just use the sounds that they're recording, you know, that they're picking up in the scene with the actors themselves?

**Shelley Roden** [04:00]
That's a really good question. They do use the sounds that they record on site. They have quite a few microphones positioned. However, they're primarily aimed at the actors and they have to record the actors dialogue because that is the most important thing. Foley is confused with sound effects because they overlap quite a bit. But if you imagine sound effects recorded in the field, like jet engines, or gunshots. We would not do that on this very contained stage. We specialise more on movements of character and bringing animated characters to life. They don't have any sounds. Animated characters only have voices. They don't have surfaces they walk on. The things that they're handling in their hands aren't real. So we are making them sound real so the audience can connect with them.

**Dr Anna Ploszajski** [04:50]
Can you play us some of your favourite sounds?

**Shelley Roden** [04:56]
Oh, favourite sounds. Gee, well, I happen to have a bunch of items set up around me. And one of my favourite setups is what I used for Black Panther, Chadwick Boseman, who I very fortunately had the pleasure of walking. And the sound that I'm going to demonstrate is when he is coming down off of this spaceship. We had to create the sound of spaceship stairs. So I'm going to do for you and then you can guess what I might be using.

**Dr Anna Ploszajski** [05:27]
Okay, we'll guess the object or guess the material.

**Shelley Roden** [05:30]
Here we go. [sounds]

**Shelley Roden** [05:38]
What do you think I have underneath my feet?

**Dr Anna Ploszajski** [05:40]
Oh, my gosh. Saskia, any guesses?

**Saskia Duyvesteyn** [05:42]
Of course, I had to think something metal because that's where my head immediately goes. So like some pots or pans or something like that?

**Shelley Roden** [05:51]
Let's see, you're getting warmer, but it's larger. It has to be larger. So what are you hearing? [sounds]

**Dr Anna Ploszajski** [06:01]
There's a metallic clang. And then there's a sort of thuddy sound. A bit of an echo.

**Shelley Roden** [06:09]
Yes, exactly. So I'm using 3 different metals to create the sound.

**Dr Anna Ploszajski** [06:14]
Oh, wow.

**Shelley Roden** [06:15]
So, on our Foley stage, we have a steel plate built into the floor. It's about 3 inches thick. And then on top of that, I have placed a diamond plate. It's made of carbon steel, I believe. However, I elevated the diamond plate using gaffers tape rolls at either corner, so that it is lifted off the steel plate. However, you can hear the thudding of the steel plate if I'm pressing down into the diamond plate. And then to make it sound like it's attached to a spaceship, I happen to have a very resonant car hood behind me. And it's connected to the steel plate, so that everything interacts with each other in a beautiful way and creates this thing that does not exist.

**Dr Anna Ploszajski** [07:02]
That's incredible.

**Shelley Roden** [07:03]
Sorry, the spaceship does not exist.

**Dr Anna Ploszajski** [07:05]
Oh, what? Spoilers, Saskia, you're our metals expert. Would you ever have guessed? That, that's what we were listening to?

**Saskia Duyvesteyn** [07:13]
No, I wouldn't have guessed. Of course, I'm happy to hear that it was made of all sorts of metals and the combination of them. And that's something I think I've learned in my career, that it's often not about one metal, but how you combine things. And whether you're adding something as what you might think is an impurity actually is something that then changes the properties of what the metal does. So I think it's actually quite unique, that I'd never thought about it from a sound perspective. Like I always think about it from a materials perspective. And so quite interesting that once again, when you combine something, you often get something greater than than the sum of the parts.

**Dr Anna Ploszajski** [07:47]
Yeah, I love that. Okay, I would love to do one more round of this game. I'm wondering if this time, you can show us what you're playing, the objects, and we have to guess what the sound is supposed to represent.

**Shelley Roden** [07:59]
Oh, this is fun. Okay, so this is obvious. This...

**Dr Anna Ploszajski** [08:00]
Okay, it's a glove.

**Shelley Roden** [08:04]
And then there's this.

**Dr Anna Ploszajski** [08:06]
A broom?

**Shelley Roden** [08:07]
It's a wicker decorative broom.

**Dr Anna Ploszajski** [08:10]
Okay.

**Shelley Roden** [08:11]
And then the third object is...

**Saskia Duyvesteyn** [08:15]
Oh, like a kind of metal grate, metal grate.

**Saskia Duyvesteyn** [08:32]
You could hear the, the branches moving? Sounded almost like a bouncing or a jumping. But I'll be honest, I don't have a clue. And I'm sure when you tell me. I'm gonna say it's so obvious that I'll feel silly that I didn't recognise what it was.

**Shelley Roden** [08:42]
Yes, exactly.

**Dr Anna Ploszajski** [08:43]
Okay. Okay.

**Saskia Duyvesteyn** [08:43]
So, ready?

**Dr Anna Ploszajski** [08:44]
Yep. [sounds]

**Saskia Duyvesteyn** [08:47]
Any guesses?

**Shelley Roden** [08:47]
No, not at all. This shows you how wide of a spectrum Foley is without the visual, you can imagine anything.

**Dr Anna Ploszajski** [08:54]
Yeah.

**Shelley Roden** [08:55]
So that was the sound of Baby Groot's footsteps. Groot is a character in Guardians of the Galaxy. And in Guardians of the Galaxy Volume 2, he is trying to help his friends who are in a cage and he is on the outside, walking on a metal grate.

**Dr Anna Ploszajski** [09:09]
Right. Okay, so this is a character made of wood.

**Shelley Roden** [09:12]
Yes. And if I were to use wood, just solid wood, it would not sound cute. He's adorable. I want him to sound like how people feel about him. So if I were to use wood blocks, it would just be like, ca-clank, it wouldn't be cute. So the broom was flexible enough to allow me to roll into it and make it sound alive like a real foot. [musical interlude]

**Dr Anna Ploszajski** [09:36]
I'm interested to think a bit more about those materials that you're using because you could buy all of your stuff fresh, right? You could have a new car bonnet. You could have a new gardening glove. What was your thinking behind the decision of wanting to use trash and kind of salvage your materials?

**Shelley Roden** [09:53]
Well, for me as a Foley artist, it's, its budget and it's also... I am very much interested in maintaining the beauty of our world as it is. So the more we reuse materials, the more time we might have to preserve this beauty. So for me, I would prefer to go to a thrift store and find knitting needles for 10 cents, rather than going to Amazon or Target and getting a brand new pair. And also, I need to listen to these things. I can't listen if I'm shopping online.

**Dr Anna Ploszajski** [10:33]
Right, okay.

**Shelley Roden** [10:34]
And then some things pop up in a sort of surprising way as useful. For example, I have some pop up foldable sunshades. And I was working on The Incredibles 2 and I had to come up with the sound of a parachute for Mrs Incredible. We could think of it as, oh, well, she has a parachute, maybe I'll gather a parachute and try it and pop it.

**Dr Anna Ploszajski** [11:00]
Yeah.

**Shelley Roden** [11:00]
But really what I needed was not necessarily the fabric sound of the parachute, which is hard to control and very flimsy. But I needed the pop that moment that pops in the air, and she becomes airborne. So I have it next to me. I can show you.

**Dr Anna Ploszajski** [11:16]
Oh my gosh, yes please.

**Shelley Roden** [11:16]
What it looks like. Yeah.

**Dr Anna Ploszajski** [11:19]
Ah, okay, so I hadn't, and when you're describing that, I thought it was like a concertina one but it's actually like a kind of, it's a sheet of fabric and then around the outside as a kind of stiff metal ring, basically.

**Shelley Roden** [11:32]
Yes, exactly. Its wired, suspended in wire, but I'll just demonstrate, just to show you what it sounds like. So here we go. Does that come through? It does.

**Dr Anna Ploszajski** [11:44]
It's a parachute.

**Shelley Roden** [11:44]
Okay.

**Saskia Duyvesteyn** [11:45]
I could completely picture Mrs Incredible jumping out of the plane.

**Dr Anna Ploszajski** [11:49]
Brilliant. And at the heart of it is your handling and knowledge of all these different materials. It feels a bit funny for us to describe them as waste actually, because what you've done is completely repurpose them into, you know, these sort of otherworldly objects in some cases. I would love to now to turn to Saskia, to tell us a bit more about, you know, where this stuff is coming from? Because, Shelley, what you're doing is giving this stuff new life and, you know, adding to the story of those objects. So Saskia, can you tell us a bit about what waste means to you as somebody who works in the production of metals at the start of their life? Where does waste come into your work?

**Saskia Duyvesteyn** [12:30]
So it's, its an interesting one that I've been thinking a lot about, as I, my background as a, what you would call a traditional metallurgical engineer. Most people say, excuse me, what is that? A metallurgical engineer? And so what I do is I process metals, that's my background. How do you actually take something from a rock and make it into something useful? And so waste is actually a key part of that. And why that is, is if you think about where metals come from, ore, people may not realise that, ore, rocks, don't actually have a whole lot of metal in them. If you think about like a copper ore, maybe it has, if you're lucky, it'll have 1% copper in it.

**Dr Anna Ploszajski** [13:15]
Wow.

**Saskia Duyvesteyn** [13:16]
So what that means is that it has almost 99% waste, right? So once you're starting with that, you're inherently, from the get go, need to think about the waste, because you're actually going to end up with more waste than metal. And so it becomes part of the process from the moment you think about it, even the moment you mine it because again, where we sit now, right? When you look at historic mining, right, and things were literally at the surface, right, you could find a native, what we call, native copper, pure copper just sitting at the surface, you could just pick it up. But that's not how it is anymore. Now you actually then need to dig to get to the ore. So you actually first need to move waste, to then get to the ore that then has waste to get to that valuable piece that you're looking at. So if we start to think about the energy that we've put in to actually get that little bit of copper, what else is in that waste that we might be able to recover? Because once you've spent that energy, then let's make sure, I like to say, have, can we squeeze every last little bit of value out of that rock before it becomes waste? And we're really need to dispose of it, right. And so that's really a shift that's happened over the last few years where before, you probably might have just looked at it from the primary metal and now recognising that there's actually a whole bunch of by-products or I actually prefer the word co-product.

**Dr Anna Ploszajski** [13:22]
So what are the sort of materials that you're getting from a process like let's say copper mining and copper processing? What are those co-products that you get alongside the copper?

**Saskia Duyvesteyn** [14:59]
In copper ore, we have things like molybdenum, we have gold, we have silver,. Those are all things that we were already recovering right as valuable. But you can get tellurium. Tellurium is used in solar cells. Well, the only way to get to tellurium, 90% of the tellurium, comes from copper mining, not from a tellurium mine. And there's a number, a number, of other elements, when you look at that, that then in some cases may not be the highest concentration. But if you're already processing them, if you think about from that incremental, that little bit of extra energy that it would

take to recover it, you're not having to create an entire new mine. You're not having to create additional waste.

**Dr Anna Ploszajski** [15:41]
And is it because it makes good financial sense? Or is it that it makes good sort of technical sense or just because, you know, you're trying to reduce the waste that you're creating?

**Saskia Duyvesteyn** [15:52]
So, I can facetiously say, yes, all of the above a little bit.

**Saskia Duyvesteyn** [15:56]
So we have all sorts of other critical minerals typically in, in, in copper mining. You have the rare earths. You actually have things like the galliums, and the germaniums, and the cobalt, and the nickels, and the indiums, and all sorts of elements that many people have never even heard of. We, in essence, have a bit of a kitchen sink, that's all available in in copper ores. It's actually not very large amount, but yet, you can't have your electric car. You can't have your cell phone. You can't have all of those other types of objects without some of those critical minerals. And you'd look at your other ores as well. You look at aluminium ores and you will find similarly things like scandium, which is key for making new alloys with the aluminium, you look at gallium and germanium, which are critical for the computer chips for cars and phones. And so again, no one would create an aluminium mine for those. But once you've processed the material to try to recover that, is just something that just makes good sense. It makes sense from a community's perspective, right? It makes sense from a net zero perspective of saying, hey, how do we actually sustainably mine and partner with areas where our mines are in making sure that we're getting that value from. It's not just one thing. It's all of that, and combined, that I think has really shifted that view of let's make sure that we are really thinking about not as a waste. But as what we like to say full value mining.

**Dr Anna Ploszajski** [15:56]
Okay.

**Dr Anna Ploszajski** [17:26]
Right? So there's this sort of shifting attitude, then, maybe the we are, you know, wanting to make all practices more sustainable, you know, everyone's trying to reduce waste, reduce energy.

**Saskia Duyvesteyn** [17:36]
Where it gets interesting more is when you start to think about recycling and reuse. Because now you have to think about, you've now recovered the metal from a certain spot. And now you've sent it all over the world, right, or all over the country. And it's now got different applications. And now if you want to reuse that, you have to now bring, and it takes energy, to bring all those materials back to a spot, to then reprocess them, which then has an additional energy footprint. So it's an interesting perspective, when you start to think about from a circular economy piece. If you were going to maybe build something for being able to recycle it, you might put it together differently, right? Because it would be easier to separate. The interesting thing is recycling our materials is actually quite challenging from a technology standpoint, because it isn't just put it back in the same process when we made it the first time. Because we've altered it right, we've taken a copper and made it into brass. You can't then just return it back to copper. You have to do additional processing to bring it back. And so we don't always know what those processes look like. And these are some really tough challenges that I actually see that the, the, mining industry is at this amazing renaissance, where there's an ability to think differently, right? To say, yes, that's how we process things from primary, right, from an ore. But if we're now going to think about I like to call those geological ore bodies, what about what we call as an urban ore body, right? The salvage yards, the other, you know, what does that look like? That still represents a resource for us. And so how can we actually think differently about processing those kinds of materials? And so there's a real piece, and that creativity that Shelley talked about, to see something and be able to think differently about it. How you might take it apart. How you might reprocess it, is part of that piece

that it really takes to be able to turn it into a useful product again, requires that creative thinking and that different way of looking at things.

**Shelley Roden** [19:43]
You've given me a different perspective, Saskia. You've given me a different perspective, if I go for a hike on the Old Man of Coniston, I know it's a copper mine. And I can look at it like, oh, how sad, but now you've given me a different perspective, which is tellerium is necessary to create solar cells. So that copper mine is integral to us advancing this technology of the way that we live.

**Saskia Duyvesteyn** [20:08]
And I think that's exactly one of the most interesting pieces in this, in this, renaissance that I think, you know, the mining industry is going through is, is, this education of what does it really take to mine? Whether you're mining for primary, whether you're remining waste, whether you're remining recycling materials, right? All of that is part of that process to be able to create the products. And so just even having people have an understanding that it didn't just magically show up on the desk, right? How did it get there? And what goes into it? And also, some of this is about consumer choice, right? Sometimes consumers, they would like the greener product, but do they want to pay the extra price for it? It's often a trade off, I mean, much of mining is a trade off about, are you trying to manage costs, or are you trying to manage, you know, footprint? It's all an interplay of that bigger circular economy to recognise as you said, Shelley, that you can't always have one without the other. And so having some of that awareness of those choices is always an interesting perspective for people to realise.

**Dr Anna Ploszajski** [21:11]
I love that. So do you think that's the future then, is recognising the value and even the small trace amounts of these precious materials?

**Saskia Duyvesteyn** [21:20]
Absolutely. And that's exactly what we do. And that's been our approach, right? Is, you know, for example, from a US government, other governments as well, have put a list together of critical minerals. And they've said, we've said from our country's perspective, right, we don't have enough of that material, we need to import it. Therefore, it's really critical for our country's economy, and different for each country, obviously. But for every country's economy, those are really critical from a from a strategic, from an energy perspective. And so we want to work on that list of materials. Well, that's one way to look at it. But we've said, but let's align that list with what do we actually have available? And what might be the easiest ones to go for first, so that we can start to build that and show an example of how to do it. While in the past, we might have said, okay, let's go for all of them. And in the end, you get none of them. And I think that's really been one of the shifts is that piece of really thinking about it in smaller steps, as opposed to trying to solve it all in one, one big jump.

**Dr Anna Ploszajski** [22:23]
And, Shelley, what's next for you? What wonderful new worlds are you going to be transporting us to next?

**Shelley Roden** [22:29]
How do I tie this in with what Saskia said. Just trying to wrap my brain around this world that I know nothing about. And I do have a question, if you don't mind?

**Dr Anna Ploszajski** [22:39]
Please go for it.

**Shelley Roden** [22:41]
Because looking at a large mining company feels so foreign to me, as an individual person. What can we do as individuals other than being aware of what we spend our money on? What can we do in our daily lives to help? What do we have control of?

**Saskia Duyvesteyn** [23:03]
So, I think that's a really good question, Shelley. And actually, no one's ever asked me that. So, I'm this is, this is, a really good thoughtful one for me. I think that in some ways, it boils down to what you just even said, is an open mindedness of and an awareness and an education piece, right? Where that just even understanding where something came from, and making a bit of that effort to sort of say, well, gosh, I might want this product. But where does that actually have to come from for me to get it? Because I actually have a belief that for, for, especially kids that are just starting out and thinking about what do they want to do for a career, probably never thought about going into mining. And yet it's this amazingly complex system that has an aspect of people to it. It has an aspect of technology. It has an aspect of computers, and digital. It has aspects of chemistry of really being able to have an impact on the world and the footprint, and it's not an easy problem to solve. And so for me, what I would love is, as you can see, I've, I've been a long enthusiastic person in the mining industry. Since I was 10, I wanted to be a metallurgical engineer. And so the passion of understanding what a complex world that is and what it all takes to get it just even if everybody understood that just a little bit better, I think would start to contribute to the choices of not just mining but manufacturing that circular economy is just really understanding where stuff comes from.

**Dr Anna Ploszajski** [24:44]
That was a phenomenal answer. Thank you, Saskia. So we've gone from vibranium to copper mining and back round again to the circular economy. I think from my perspective, I can definitely guarantee that I won't be looking at my trash in quite the same way again. It might be a much more musical household than it was this morning, we'll find out. But a huge thank you to my guests this episode. Foley artist Shelley Roden and metallurgical engineer Saskia Duyvesteyn. Thank you both so much.

**Shelley Roden** [25:14]
It was such a pleasure sharing it with you, Annd, and you, Saskia, and listening to your stories. Thank you.

**Saskia Duyvesteyn** [25:19]
It's great to get to meet you. [muscial interlude]

**Dr Anna Ploszajski** [25:23]
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