

Things You Can't Live Without

S2 Episode 6 – Beatrice Galilee on nature-inspired sustainable design and future architecture

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Dr Anna Ploszajski:

Hello, and welcome to *Things You Can't Live Without*, the podcast where I, material scientist Dr. Anna Ploszajski, ask a special guest to tell us the one thing that they can't live without. We also interrogate a host of experts to find out how these items are made, where their components come from, and how the future of those items is being planned for.

Joining me today is Beatrice Galilee, founder and executive director of the architecture and design platform *The World Around*. Welcome, Beatrice

Beatrice Galilee: [00:30]

Thanks for having me, Anna.

Anna:

Really, really happy to have you here. And we're also joined by Brett Capper, General Manager, Asia Pacific for Studies and Product Shaping at Rio Tinto. A very warm welcome, Brett.

Brett Capper:

Thanks for having me, Anna. Excited to be here.

Anna [00:01:00]:

So, Beatrice, tell us, what is the one item that you can't live without?

Beatrice [00:01:05]:

This is an object called Botanica. It's a vase that was designed by the Italian design studio, Forma Fantasma, that is made of resins and different types of plant-based materials. And the vase was designed as part of an exhibition to provoke the question of what would design look like in a world if oil hadn't been invented. The object itself, as beautiful as it is as a formal object, that it really appeals to the aesthete in me. What I love so much about this vase is that it contributes to a conversation of what if, and sometimes objects are solutions to things like, oh, I need a vase to put my flowers in. And sometimes objects ask us to think about the whole world. And they ask us to consider what if there were no plastics and what would that world look like and what if every object didn't extract but that somehow contributed to a better world and what if design and architecture could be a leader in that conversation and not a follow up?

Anna [00:02:00]:

I love that. Yeah, I'm from the world of science and I feel like in that world we think about like a hypothesis as kind of like a what if question. It's sort of the same thing. So yeah, I see your vase as like a hypothesis of a world. Brett, what do you make of Beatrice's vase?

Brett:

I think it represents a really interesting view of what could be.

Anna:

Yeah.

Brett [00:02:30]:

I make no bones about the fact that I'm a mining engineer and I've spent my life figuring out how to extract things out of the earth, but the idea of a world and starting a conversation about what does the world look like without a plastic and then where that takes my head to is I start to think about how our definition of sustainability would be different.

Anna:

Yeah, I really want us to get onto those potential imagined futures, Brett. And this is an interesting choice, I think, because, you know, previous episodes, we've had things like a bicycle and a water bottle and things you utilitarian objects that people rely on practically every day. But the reason I like your choice is that it really demonstrates, I think, the significance that we put onto intentionally made and handmade objects and the meaning that we impart into objects through those processes.

Beatrice [00:03:15]:

Just really generates so much beyond the object and I think that's how I see design and the role that I think about making an exhibition or I think about telling the story of an object. The materials, the making, the beginning story begins with a kind of an intention and then it comes to the material and then it comes to the object and then it comes to the user, and an object can be part of that conversation and not just a utilitarian solution. It can be utilitarian as a provocation, as an intellectual stimulation.

Anna:

I love that. Yeah, we're going to dive into a lot of those concepts in this episode, including with materials as the kind of core concept and how they're used in design and architecture, what innovations are underway to construct the built environment in the future better as well. Beatrice, to give our listeners an idea of quite how successful you have been in the world of architecture and design. You are the first ever curator of contemporary architecture and design at the Metropolitan Museum of Art in New York. And you're also an author, you've written a book called Radical Architecture of the Future. Reading your portfolio of work, what really struck me about it was the diversity of materials combined with global architectural styles. Can you tell us a bit more about your platform? I mentioned it earlier, the World Around.

Beatrice [00:04:30]:

World Around is a platform. We organise events, exhibitions, talks, and the idea of the World Around is to be the place for global architecture that has a progressive ecological and social cause, and we champion the architects and designers that are moving the discipline forward into that direction. So we organised talks about the idea of radical repair, looking at designers and architects who are aware of the role that the construction industry has played in causing a lot of the climate catastrophe that we're facing, but also in resolving many of them, and we try to be as productive as possible. And we tried to give a platform to the people and ideas that we see as the way to go, like the kind of lighthouses on the rocks, you know, this is the direction we should be following as an industry.

Anna [00:05:30]:

That's awesome. If we stick with the kind of theme of materials and also going back to your vase, can you tell us a bit more about what is the significance of drawing from these sort of nature derived materials?

Beatrice:

So, there's a series of 12 vases and each of them have a slightly different combination of materials. Some of them use kind of hair, they've used some have blood for dye, which is also a very old-fashioned way of making things. So, I think that looking into nature as part of the solution to a lot of the waste that we see in the world is super interesting to me. So, there are many types of plant fibres that can be turned into plastics right now. And for example, water hyacinth is an aquatic plant that's native in Kenya that's actually a kind of invasive species, if it undergoes a certain number of chemical transformations, it is actually a really effective single use plastic alternative and can be, and is currently being rolled out in Kenya where there is no single use plastic allowed. Looking to nature as a number one choice is actually really smart.

Anna:

Brett, does this idea of biomimicry come into your work at all, being nature inspired, or nature derived? It does,

Brett [00:06:30]:

It does, from a number of perspectives. It's about how do we manage the legacy before we build? Before we start, what's the end? And when I say the end, it's not getting the stuff out of the ground. Its once things are out of the ground, what's the end look like? Where do we want to get it to? Probably the climate challenge is, it's what's opened the Pandora's box. But all sorts of technologies are coming to the fore. What can we use from nature to support us in the industrial activity that we need to do and then to minimise the legacy? I mean, concrete as an example. So, concrete as a material is an amazing material, but it's not actually that great for the environment, creates a lot of carbon dioxide in its building. But you know, the work and we've got teams of people that do this work working on geopolymer solutions. So, silicate solutions, different styles of concrete that not only can we use material that wouldn't otherwise be suitable to go into concrete. But they also sequester carbon dioxide as they set. These are solutions that are out there in nature with a little bit of chemical magic that is well above my education. But does amazing things to transform the way we choose to plan. And the way we choose to implement the projects that we do.

Brett [00:07:45]:

I did really love the talk about radical repair though. I think there's really something in that concept about how do we something different and something balanced when we build it. I think is such an amazing concept that should flow through all the thinking that we do predesign for the projects that we build.

Beatrice:

Yeah, I mean, I think for us at least radical repair is a way for us to show that architecture and design as part of the conversation right at the beginning can really make an impact, can really make a difference. When you integrate design thinking right at the beginning, it will always pay off. And we are working with a very young woman in Bolivia who is part of an indigenous community. The Amara people based in El Alto in Bolivia. I don't think it's you, Brett, but you know, a lot of what happens with mining, of course, is metal gets into the water where it gets into the lakes, gets into the ground, affects the byproducts of a lot of these mining activities are terrible, but the solutions are actually right there in nature.

Beatrice [00:09:00]:

And so, we're working with this young woman who has found this plant called the Totora plant and the roots of the Totora plant naturally filter metals. This is a native plant that her community have been working with for hundreds and hundreds of years, maybe thousands. She's creating rafts from the plastic waste that is floating around on these lakes. And then she's planting Totora plants into the rafts and letting them float out onto the lake. And the lake is cleaning itself. And, you know, it's not about who did this wrong and, you know, who's responsible, it's actually just like getting in there and fixing the problem, using the knowledge, using design, using architecture, working

together. And this is so exciting for us, you know, as a design platform, how can we spread the word about this?

Anna:

I just think Indigenous knowledge is so obviously important and such an untapped resource at times. Brett, is there, are there examples at Rio Tinto where Indigenous knowledge has impacted any sort of activities or how the mines are designed?

Brett [00:10:00]:

Absolutely there are. The best examples is, so we run bauxite operations on the northern tip of Australia at Cape York and we've had a relationship with the traditional owners since the 1950s, really, when we started working up there. When we came to do our most recent expansion up there, probably a decade ago, we knew that the area that we were going into was very sensitive from a native animal perspective. So lots of the sea life in particular, sea turtle habitats, swordfish habitats, stingray habitats, amazing shark habitats, lots of work went into the team and extensive interface with the Indigenous owners who understood, they understood how the turtles, where they nested, how they moved up and down the shoreline. They understood the annual migrations and that work continues. So, we're, we've got a very long dated potential operation a little bit further to the north and doing lots of work now with the local Indigenous team to understand the movement of the stingrays and the swordfish in and out of the area. But there are other places in the organisation where we're doing lots of experimental research to understand how do we use nature going forward? How do we use technology and local knowledge in order to minimise carbon footprint?

Anna [00:11:15]:

Beatrice, we've been talking about decarbonisation and sustainability generally, thinking about architecture specifically, what are the big global challenges in architecture right now?

Beatrice:

Well, it's complicated with architecture because, of course, the housing crisis. And, rapid population growth is happening, for example, in Africa and Asia, where cities need to be built. At the same time, you have a problem of the building industry being one of the largest contributors to carbon emissions. You have in different regions, really different solutions and really different crises. As a global answer, I think there's a real crisis of the role of architecture. Why be an architect? You know, there is a potential misunderstanding about the responsibility of an architect. What is the role of an architect who has a training in history, has an understanding of cities and humans and nature and society? One of the biggest issues in the architecture community is what is architecture and how to better defend it, explain it, and champion the best architects and designers.

Brett [00:12:30]:

There's a really interesting crossover there between your first point, which was about the volume of waste in the building industry, and the role of the architect in that design. And again, my head goes to that same project we did, which, you know, the marine architects that we used did a really amazing job to understand the impact that this wharf facility could have had did the design work accepted that building it in place over water, not only created a whole bunch of risk for people, but a whole bunch of risk for the environment. They modularized it overseas, built it in a factory, cleaned it and everything brought it to site. And instead of having to put 100 odd piles into the sea floor, we put 28 piles into the sea floor. And then every time we need to do a repair, instead of using the solvents and stuff that we could use in a controlled environment, they use bicarbonate of soda. It sounds funny, but it's using the appropriate tool for the job, but all of that's enabled by great design.

Anna:

Beatrice, do you have any favourite examples, maybe some projects from the world around have

been really outstanding in kind of sustainability or kind of future focused materials and building?

Beatrice [00:13:45]:

A few different one's pop into my head. Design and architecture can extend into what we call like design for multi species and there is a whole movement in the current architecture and design, which is more than human, how to design for the more than human, for example, there is a school in Madrid designed by an architect called Andres Hacker, which has, designed in its skin, kind of made of cork and it's designed to allow for bees it's designed to allow for birds, it's designed to allow for all of the insects, and the biodiversity of the area to inhabit the building and age with the building. And so, the building itself, like this living skin and the school itself is like a living diagram of the ecology of the community. And the children that are going into the school are going to school with their teachers, with their colleagues, but also, they're going to school with the bees. They're going to school with the birds. They're starting to build a habitat and understand their place in the world as something that's not just humans over other things, but humans with other things. And understanding our role in that is a really interesting through line that runs through a lot of the architects and designers that we work with and have spoken with.

Beatrice [00:15:00]:

One interesting project that the World Around was involved in is Times Square Arts asked the World Around to write a brief for an installation in Times Square. We're not really into the idea of wasting materials. I think the brief is basically going to be, do no harm. How can you create an installation that does no harm and maybe goes one step further and is part of our radical repair conversation. The winning project is so smart, and I love it so much. So, the architect Penela Orsted from Sweden, she's based in New York. She said, well, instead of recycling, I'm going to pre cycle 40 oyster gabions that will then be transformed into this kind of cube structure inside Times Square. We're going to use natural organic pigments to create this beautiful heart shaped structure, but directly afterwards we're going to collaborate with an institution called the Billion Oyster Project, which uses oysters as a kind of climate resilient infrastructure all the way around the harbor of New York. Oysters are absolute miracles and New York used to be full of oysters. And so the whole structure is going to be, it's temporarily in Times Square and then directly afterwards, each of the gabions are going to go and be research centres for the Billion Oyster Project, where they will be filled with oysters and then used to teach children about oysters and about the reefs and about coastal resilience and the role of oysters in cleaning the waters around Manhattan and how we can use oysters and oyster beds to build climate resilience.

Anna [00:16:45]:

And listening to both of you, I think one theme that I'm picking up on, I suppose, if we think about the kind of past, present and future of both of your lines of work really is this idea of scale and scaling responsibly and scaling sustainably. Brett, I'll come to you first. Rio Tinto is very, very, very large scale. It's kind of by definition. What does scale mean to you and what are the big challenges with scale at the moment?

Brett:

I guess scale comes from two perspectives. There's the straight economic perspective of scale and economy of scale. There's a reality that says we do things that are big. Because we can do them more efficiently at scale. But the other side of scale that we're really chasing is about replication. So, what we want to be able to do is figure out how to do something, do it well, and then replicate that. We've got operations everywhere and trying to replicate what is great practice and accelerate the sharing of that. Whether that's wetland filtration for water before we release it off site. Whether we end up having to go heavy technology routes like reverse osmosis for water cleaning. The most recent example I guess is the adoption of biodiesel. So, our boron operations in California. Went 100 percent renewable diesel 18 months ago. Very, very rapidly, what we learned in that small operation in California, we transferred to our very large operation outside Salt Lake City at Kennecott and went to renewable diesel there.

Brett [00:18:15]:

So, one of the more interesting ones, and it harks back to the conversation we had on modularisation. The wharf that we built, and I love the wharf because it was really cool, but, you know, it's got the same amount of steel in it as the Brooklyn Bridge. But it was built in 10 months, not 14 years. It's not a fair comparison from a point in time perspective, but what it talks to is about, you know, in our case efficiency from scale and it talks about how do you minimise waste, you know for every day that a person turns up to a job site they're going to create waste associated with that job and so the better we can get at doing big things quickly our ability to minimise the impact is significantly larger. And again, you know, it's all driven by architecture. Good architecture, good design, allows us to rapidly replicate really good practice.

Anna:

Do you recognise themes of replication in your work, Beatrice?

Beatrice [00:19:15]:

We have a mentorship program called the Young Climate Prize, which is open to anyone under the age of 25 who has their own self started, design-based initiative that solves a climate environmental crisis in their community. And what we do is create these mentorships between very young, very driven, very talented people from all over the world with a pretty famous, important designer or architect at the top of their career. So, we create these intergenerational relationships that transfer knowledge. Both ways, like the example of Bolivian woman who is solving cleaning polluted lake water with plants. She's in a mentorship with an Argentine entrepreneur. And so, by making these connections between generations, that for us is a kind of a scaling. And then what we do with these young people, we have a cohort of 25 of them. They all go through what we call a design academy and every week we listen to people like Brett or others in the industry and other different industries who can share their knowledge with these young people. We do workshops and training. The sequential impact of these cohorts one year after the next for us is about scale and it's about scaling the stories of young people and connecting them to the major industries that we're connected with as the world around, and we're getting our young climate cohort, people who have found ways to reuse corn husks to make furniture, people that are using plastic waste that they've scraped out of the beaches where they live and turned into school furniture, people that are cleaning the waters to create kind of bricks out of melted plastic that could be providing work for women in their communities. People that are using education and skills training inside prisons to be part of the part of the criminal justice system could be about providing work in reducing recidivism as well as increasing the green transitions in US prisons. The range of projects is huge, but we're getting these type of people in front of real champions of industry, even though we're very small and we're just starting, we're like a little tugboat, you know, like we're trying to make a difference in the way that we are. And we have connections to people that have so much more power and so much more influence. That's our scale, my scale idea.

Brett [00:22:00]:

I think you've hit the point though. It's about connection. That's what generates scale. It's about dispersing the idea, you know, we get to do it within a very nice formal bureaucratic and controlled structure set. You get to do it in this amazing organic interface with just a whole bunch of really driven people. But, you know, scale and sharing and information is what generates the change.

Anna [00:22:15]:

That's beautiful. I love that. So, we've nearly come to the end of our conversation, I think, and it has led to a place that I wasn't expecting. Actually, I think one of my big takeaways is this idea of knowledge and where knowledge comes from where we find it. Beatrice, you were talking about the knowledge of your young people in the Young Climate Prize. We heard about Indigenous knowledge from Brett and your examples of how Indigenous knowledge is really important in Rio Tinto's operations. And going back to the vase, which started our conversation, the knowledge of nature as well, the knowledge of nature and building polymers that are able to do all these incredible things or have all these incredible materials, properties, and we can go back and we can

learn from that knowledge as well.

Anna [00:23:00]:

So, a huge thank you to my guests this episode, the World Around founder Beatrice Galilee and Rio Tinto's Brett Capper. Thank you both so much.

Beatrice:

Thanks for having us.

Brett:

Thank you.

Anna [00:23:15]:

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