

Things You Can't Live Without

S2 Episode 4 – Ruby Wax on laptop addiction, mindfulness and community

No. of words	5,167	Time	25:50 minutes
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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 very 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.

In this episode, I am delighted to be joined by Ruby Wax, OBE, comedian, performer, and author. Welcome, Ruby.

Ruby Wax:

Thank you. Hi.

Anna:

Also with us is Nigel Steward, Chief Scientist at Rio Tinto, who you might remember from Season 1. He's going to be taking us through how innovations in processing allow them to create more from less. Welcome back, Nigel.

Nigel Steward:

Good to meet again Anna.

Anna:

So, Ruby, what is the one thing that you can't live without?

Ruby:

Well, clearly it's a computer, otherwise we wouldn't be having this conversation. I mean, I don't know what else to say. I could send you a dove with a pen in its claw, but I don't know how many years that would take. So, it's a computer.

Anna:

Yes. Enabling us to talk today and to do many other things beside. Nigel, is that the same for you? Could you live without your laptop?

Nigel:

I don't think these days, no, it's so much an integral part of our lives, everything we do.

Anna:

Yeah. Same here. I use my laptop for everything, for work, for entertainment. I live on my own and much to my mother's disgust, I often will watch TV on my laptop while I'm eating.

Ruby:

The whole point is it alleviates loneliness. I sleep with mine.

Anna: [01:30]

So in this episode going to be using the laptop as a conversational jumping off point to discuss the theme of creating more from less in both the physical world, as in the materials that go into making computers and in the mental health space.

As in your work, Ruby. And many listeners will know you from appearing on our screens and stages around the world. But you also have a master's degree in mindfulness based cognitive therapy from Oxford University. And you've been awarded an OBE for services to mental health. And Ruby, fun fact, I think you might have been at my graduation because I did my undergrad at Oxford and I think we graduated on the same time, 2013.

Ruby:

No, Did we throw our hats in the air at the same time?

Anna:

We must have, yeah.

Ruby:

Yeah, it's the happiest day of my life. Yeah, because I flunked out of nursery school, so it was such a surprise, 80 years later to get that award.

Anna:

Not 80, but yes. Yeah. Wow. It's such an achievement. Well, for you too. Thank you.

Anna: [02:30]

Can you tell us what brought you to want to study mindfulness formally in that way?

Ruby:

Well, I had done a lot of therapy clearly since I was a child. And, you know, eventually you realise you're repeating the same story over and over again. And I polished it up so much that I thought, well, why shouldn't I be charging you?

Well, eventually I did turn it into a show. And did charge. Because all you're asking the shrink to do is to please help you have some insight or be able to run this machine called the brain. It's like we have a Ferrari on our heads, but nobody gave you the keys. Here we are 2025 and we still can't pull the brakes.

I mean, it's a no brainer. So I thought I'll try mindfulness because you do cut out the shrink. I like the neuroscience of it. So that's why I went to Oxford to say, explain to me what you do and what happens in the brain and sure enough, you can't see in an MRI scanner. In certain areas, becoming more activated, in charge of self regulation, focus, attention, all the things that we're lacking today.

Anna: [03:30]

So do you see the brain and the computer as operating in a similar way then?

Ruby:

Well, the computer doesn't have consciousness, nor does it have a sense of humour? And I don't think it ever will, because it has to understand irony. I don't think that's coming with a piece of equipment or software.

Anna:

Neural networks.

Ruby:

Neural networks, which is emulating the brain as much as it can, and it's going to get more and more sophisticated. But I think emotionally it's going to have a tricky time.

Anna:

So speaking of emotions, how do you feel about your computer?

Ruby: [04:00]

I love it. I can't live without it. And I'm addicted to it. Addiction is what you can't live without. And interrupts your life. And this certainly interrupts my life. I mean, I'm ashamed to say, I'm not, I, you know, oh yes, I just use it to write my books or I just use it to answer an email, except I'm answering spam. The adrenaline and the dopamine of answering somebody I've never even met is a kick. And every day I try to get to the top of that list. And I think, you know, I would be a drug addict if it wasn't for my computer.

Anna:

So how does mindfulness help to short circuit that?

Ruby:

Well, I can, I can sometimes shut it down.

Anna:

Yeah.

Ruby:

And while I'm meditating, I can feel my fingers reaching for the computer and on a good day I can stop myself. And I don't think I would have even thought of that if I didn't do mindfulness.

Anna:

Yeah. Gosh, I sort of catch myself reaching for my phone for no reason. Or 20 minutes later, I remember why I went to my phone in the first place was to check something.

Ruby:

Do you feel it vibrating even when it doesn't?

Anna:

Yes

Ruby:

Because what does it represent? How many people will come to your funeral? I mean, how much love do you need? And you don't even know these people, or do you like them?

Anna: [05:00]

Yeah, gosh, that's so true. Do you have that, Nigel? How do you feel about your computer and devices?

Nigel:

I don't have the same challenges that you two have. I quite happily leave my computer and leave my phone to one side. And I tend to focus on one thing at a time. I've come to terms with that. I switch off all of the alarms. You know, all of these like buzzes, vibrations and things on my phone. It's the very first thing I do when I get given a phone. So I switch everything off.

Anna:

You could teach us a thing or two, I'm sure, Nigel.

Nigel:

That's my version of mindfulness. I just focus on one thing at a time.

Anna:

That's the definition of mindfulness, I think. No, not really. How do you define it then, Ruby?

Ruby:

I think it's just being aware in the moment without kicking your own arse. Okay, okay. So if I multitask or I, people think, oh, I think 3,000 thoughts a second, you're supposed to, that's what's keeping you on earth.

Ruby:

The machine of the brain keeps working, keeps working, but we all know there's an observer bit and that gives you a little pause before you act on it.

Anna: [06:00]

Got it, and forgiving yourself for that, yeah.

Let's get back to the hardware of this. Nigel, tell us, you're in the business of metals, materials, minerals coming out of the ground. What are the materials that go into our computers?

Nigel:

Well, there are many. I think on the previous podcast, you, you mentioned the iPhone and you know, an iPhone is just a mini computer at the end of the day. So there's a huge range of elements in it. But there are some significant ones. The casings are quite often in aluminium. All the wiring inside of it is copper. There's gold in there as well. There's the obvious things like the silicon and the dopants that are used to make the silicon function as a semiconductor. The screen with the rare earths. Of course lithium. Portable computers have the lithium ion batteries. So a huge range of materials.

Anna:

I always think of our electronics as kind of like a celebration of the elements.

Ruby:

We're celebrating, but there's a depletion somewhere else. They're borrowing them from the earth.

Anna: [07:00]

Yeah, absolutely. And the tension that we've come up with is that we rely on this stuff for work, for mental health, every day. I like your word borrowing, Ruby. I think that's a really thoughtful way of putting it. And in order that we'll be able to create these things in the future. We need to be able to do more from less and be more efficient about it, more sustainable about it.

Ruby, you are such a creative person. Your list of TV episodes, comedy shows, books is almost endless. It's, it's such an impressive body of work. And I'm interested in the environment that you need, the conditions that you need to create. Can you take us a bit through your creative process?

Ruby:

No, that's impossible to say. I'm a mere mortal. I don't know what makes me creative. I know when I write Absolutely Fabulous, it's the night before. And Jennifer Saunders also, there's a bolt of lightning and suddenly she, in real life she's not that interesting. And then suddenly this genius comes out, it pours out of her and there's no question there's a comedy rhythm. You can't mistake it for anything else. It's like jazz instead of a symphony and it's notes that you wouldn't expect. It surprises you and makes you laugh, which is just a scream and a surprise. So, I don't know what

brings that on. It's just the way I think.

Anna: [08:00]

Wow, so an iterative process then? Or just a..

Ruby:

It's chaotic, it's just chaotic. And it can happen anywhere, usually in the back of a bus.

Anna:

Wow

Ruby:

Or it has to be movement, or on a plane. If I sit still I can't create.

Anna:

Yeah, I find that too. I used to write a bit of comedy and I used to do my best writing in the swimming pool, which is really annoying because you can't write it down, you have to remember it. Do you find that the creative process is a way of processing events in your life or things that you've seen, conversations that you've had?

Ruby:

Well, the books that I've written, How to Be Human with a Monk and a Neuroscientist or Say New World, they weren't science. And, but I did it with a twist. So I used for my dissertation at Oxford, I talked about neuroscience and mindfulness and then I just flipped it with comedy and took it on tour for three years and wrote a book called The Mindfulness Guide for the Frazzled.

So I'll kill three birds with one stone. I am not a fiction writer, so I take something like evolution or relationships or sexuality or whatever. I'll read up on it. But then I'll steal from everybody and then flip it into comedy so they can't find that I've plagiarised.

Anna: [09:15]

Right.

Nigel, can you take us through a bit of what processing means to you?

Nigel:

Well, yeah, it's the way in which we transform the rocks that we take out of the earth into the materials, the minerals, bauxite and chalcopryite. So the bauxite, which is the source of aluminium. And the chalcopryite, which is the source of copper. So you have to take that copper and the aluminium out of those rocks. And in the case of copper, there are two ways in which we can do it. We can either take the ore that we mine and leach it with acid or with water and bacteria. And then you leach the copper out into solution. You then concentrate it. And again, you use an electrical current to deposit copper. An alternative way of doing it is you take copper, you concentrate it, and you then take it to a smelter. Where you inject oxygen into it and heat it at a very, very high temperature. And it forms copper sulfides. Then you boil off the sulphur. And when you purify the copper, you can co generate things like silver and gold, because they often co-exist with copper as well.

Ruby:

You could make gold?

Nigel

Yeah.

Ruby:

Now I've woken up.

Nigel: [10:30]

Oh, so in our operations in Salt Lake City in Utah, we make not only copper, but we also make molybdenum disulfide, gold, silver, and more recently we've been producing tellurium because that coexists with copper and that tellurium goes to make cadmium telluride for solar panels.

Ruby:

Wow. I can't turn this into comedy as much as I could try. There's no way I could flip it. But keep going. I'm fascinated.

Anna:

I think what's interesting, you know, Ruby, you said you can't make comedy out of this. That's because there are no surprises. Or are there, Nigel?

Nigel:

Well, I think this is the connection with human beings and what we call human factors.

Nigel:

Most people in our industry, they're like me. We tend to have to focus and we can't remember too many things. And when we're overloaded with too many things, we make mistakes. So our processes can go out of control. So, we tend to think about how do we simplify our operating instructions so that they're easy to remember and easy to implement. The more complex they become, the more likely you are to have a procedure which will take your process out of control.

So the general rule is you don't want to really have a process that a human being has to go through with more than seven steps. And the other thing that we work a lot on in our process is where often you'll come into our process plants and you'll see these massive control rooms full of screens showing everything that's going on into the process, every single pump and, you know, injection point, everything is there and all of these things can be alarmed and the equipment manufacturers send these things with alarms. So imagine when something starts to go wrong. All the alarms go off. And you think, well what the hell am I going to do? If you're an operator, you're in utter panic, right? So what we have to do is we analyse all of this and possible events in advance. And we minimise the number of really, really critical alarms. And it's a process called alarm management to make it easier for a human being.

Ruby:

But you know, in a way, it's so much like the brain, it's that, you know, you have all the meat and there's all the components, but how does it eventually go into thought? How close do you get to making a human, ultimately, not with the iPhone, that's just voice, but with the internal thinking, do you think that the components will ultimately be able to make decisions? They already do.

Nigel: [12:30]

Well, there's some interesting work that we've been doing using what they call deep learning surrogates, which is a form of AI. So you have to train it with data from your processes and from computer models that exist that we've put together as human beings. And you can train a deep learning surrogate and it can make calculations incredibly quickly. We've done some work recently where a simulation took six days and the deep learning surrogate can do that same simulation in less than a second once it's been trained.

Ruby:

Is there a moment where you think they use creative thought?

Nigel:

No.

Ruby:

No. Do you think there will be?

Nigel:

It depends what you mean by creative, creative. I've seen some quite interesting things where it's created some very unusual objects. I've seen one with the heat exchanger, the deep learning surrogate actually designed that did look very, very creative rather than being sort of standard rectilinear channels where a coolant would pass in a heat exchanger. It came up with this very curvaceous object. It looks like some sort of flashy designer object. And that for me is something that was creative because an engineer would never actually do that because an engineer would be thinking, well, I have to actually make this at the end of the day. Whereas that limitation on the DLS system wasn't there.

And it came up with this highly curvaceous object. It was very, very unusual. So you, you look at that and you think, well, this is possibly creative, you know.

Ruby:

Yeah, and maybe comedy someday.

Nigel:

I'm not so hopeful about that because of your irony point. I've seen some AI generated joke and it's not funny.

Ruby:

So have I.

Anna: [14:00]

Oh, gosh. Yeah. It's bad. So Nigel, is that an example of using machine learning to be able to innovate processes, to make them more efficient, to create more from less?

Nigel:

And that can certainly be a big part of it. It's less in the processing, but more in the product end use, where we can use a lot less of something. Or it might be a component that goes into a processing plant. In processing itself, the type of thing that we tend to think about is how do we actually consume a lot less? How do we get a lot more from the ore that we mine? How do we reduce the energy consumption? How do we use less water? How can we generate other byproducts that can also be useful to society that would avoid digging up something elsewhere. So, it's thinking more like that.

Anna: [14:45]

Nigel, can you tell us about the change in process in ElectraLith?

Ruby:

Tell us what it is, Nigel.

Nigel:

Oh, ElectraLith is a start up in Australia that we're working with. It has a membrane technology that can extract lithium selectively.

Anna:

Lithium selectively? What does that mean?

Nigel:

Yeah, so one of the sources of lithium are the brines, deep underground brines. So they're a

mixture of different salts, all sorts of other materials, and what you want to do is try and selectively extract the lithium. So the way that's done today is the salts are brought to the surface and they're evaporated and you can extract the lithium that way. What this technology can do is you basically pass the brine with all the mixture of salts on one side of the membrane and what comes out the other side of the membrane is just the lithium. So it's a special material they've designed that only lets the lithium through. So there's no water loss.

Ruby:

Who started, you know, can you imagine the trial and error that goes through this? How did they figure it out?

Nigel:

Well, it's the same kind of creative process as you, but in a different field. These people, they're imagining, how can I design a solid that's a lithium ion conductor? And they think about the physics and the solid state physics and chemistry of that.

Ruby:

Right.

Nigel:

And they're saying to do that, I need to find this solid membrane.

Ruby: [16:00]

I've never gotten up in the morning thinking I've got to find a solid membrane. It just hasn't happened. I'd like to have Nigel's brain.

Nigel:

Different people are switched on by different things. That's the creative process for us. There's a challenge out there that we're trying to solve, usually around how do we produce the materials with a zero carbon footprint and a much improved ESG footprint. And then you put your mind to solving those challenges.

Anna:

Nigel, you were talking about what motivates scientists and surely one of the biggest motivators for scientists these days is the environment and is trying to do things that are going to be more sustainable and better for the environment. Ruby; the environment is a cause of major worry for a lot of people and, I would imagine in your work you come across people who have poor mental health because of environmental concerns.

Ruby:

I don't know. You're making a jump there. I mean

Anna:

Do you think?

Ruby:

A mental disease is like having cancer or diabetes. So, it's not a thing because you're thinking incorrectly or you're fearful. You know, what Lewis Walpole said, "a tumour is to cancer what thought is to mental illness," It's the outcome of it, not because of it. They're not worried about the environment. They've got a disease. It's in their DNA. It isn't what you're thinking. It's what you're, your physiology.

Anna:

Yeah. Okay.

Ruby:

It's not because they're worried about the environment.

Anna:

No, of course. Of course.

Ruby:

It may be a byproduct, but they're sick and they need medication. Isn't it interesting, you're mining lithium and a lot of people need lithium for their mental health. Isn't that interesting?

The same thing that's put in an iPhone is put in a human body.

Anna:

It's amazing, isn't it? Yeah. Who needs it more, do you think, Nigel?

Nigel:

I think many elements have many uses. I think that's the interesting thing with the chemical world. If you think about nuclear fusion going forward, if that ever happens, the nuclear fusion actually needs lithium as well.

Ruby:

Does quantum computing need lithium?

Nigel:

Not sure.

Ruby:

Well, that may be a way of saving energy. I'm not going to give you any more ideas, Nigel, because, you know, if I see you've stolen them, there may be a lawsuit.

Nigel: [18:00]

Yeah. We use lithium to make aluminium alloys even lighter. So some aircraft use aluminium.

Ruby:

There you are. Yep. You outsmart me again.

Nigel:

Lots of uses

Anna:

It's incredible the diversity of uses. So we've talked about lithium as being such an important material that we need it to be future proofed in order for us to have not only computers, but also every other battery powered thing that we know of. What are the other ways then that we are trying to future proof this vital material?

Nigel: [18:30]

Well, I think in the example of ElectraLith, Anna, that's one way, that's a technology for the future. But what we're actually doing now is we're using a resin technology. So this achieves a similar result to ElectraLith. It's a way of extracting the lithium from a brine and then returning that brine back into the ground rather than evaporating off all the water so we get that water loss. So the way the resin works is you pour the brine with all of the magnesium and the calcium and sodium, lithium, everything in it, and the resin just picks up the lithium. You then take it to a next stage where you wash out the lithium and you selectively wash out the lithium. So that's a way in which we can drastically reduce our water consumption whilst producing lithium. So in, in Rincon in Argentina, we use this process for the first time. And in December, 2024, we successfully

produced our first lithium using this extraction technology.

Anna:

Ruby, tell us about your Frazzled Cafe then.

Ruby: [19:30]

Well, you know, a lot of people say that working on through the screen doesn't really help the situation of loneliness or human connection, but I created Frazzled Cafe, which is I'm emulating AA. Steve Rowe, who owns Marks & Spencer, gave, you know, the cafes up and down the country, and we could have small meetings. And people would speak from the heart, and they would be more human than they are probably in the office. And that made them feel heard. It isn't from mental illness, but who knows, there might offset something severe, because talking is half the cure. And you meet your own people, and that's such reassurance that you're not making this up.

Cause you don't make up diabetes and you don't make up mental illness, but in this culture, they seem to think it's part of your imagination. Anyway, I've created that and we, because of COVID we met online, but when you're not using it for business and you're just staring in the whites of somebody's eyes and they're speaking from the heart, believe me, that oxytocin passes, you know, compassion oozes off that screen. I do about 80 people every two weeks. And when people speak, and a hundred heads nod in agreement, you see just this person light up. Because stuck in their little home, they're too afraid to tell their family or friends or whatever's going on. It doesn't have to be heavy, but just the human condition. It's got a format, and we've been going seven years, so that's where hurrah for computers.

Anna:

Can you tell us a bit more about the format for it?

Ruby:

We top and tail it with a little mindfulness so that you get that brain down because if your mind is still in the office or it's past or future thinking you're not in the room, so we try to get everybody settled, defrazzled and then there's a moderator. And they say, please put up your hand and don't speak for more because there's so many people. So somebody just speaks from the heart. I always start off saying, what's the weather condition going on inside of you? I don't want what happened last year, or I don't want to hear about politics. The news is out.

So people start to use that muscle of, this is what I'm about right now. And for some reason that really resonates and it makes it human. We really want to hear the expression of the heart. Nobody ever takes over. They don't go on for hours and hours the way they do on television. But when you have all those people listening, they just state their truth. And then the moderator says who else resonates with this story. We don't give advice. It's not therapy. Then there's breakout groups and you meet your people and it does feel like a community and that's what we're lacking. So I'm using an artificial means to create community and I don't know why the government or somebody else hasn't emulated it because it's so necessary.

So I hope we can keep the funding up so that we keep this going or there's something else like this. I don't need your point of view about the news. I can listen to the news and that just riles you up anyway. Let's think what the news does to you. You know, if you're talking about cortisol overload, well, how much do you need?

Anna:

Yeah, I totally agree. It's like Nigel's machines just turning all the alarms off, not being bombarded constantly.

Ruby:

Well, I hope that they make a piece of technology that gives us that neural feedback. That's what mindfulness does. You get feedback from your own mind as to where you are. Are you going into a danger zone? Where, you know, constantly in a state of FOMO. This didn't exist a hundred years ago.

Anna:

Yeah.

Ruby: [22:45]

Hopefully there would be some technology that can help us with that, to say you've got enough. It's enough now.

Anna:

Yeah. I like that concept of enough. If our listeners could do one thing to improve their mental health, to take a step in the right direction, to take a step off that frazzled path, what do you recommend?

Ruby: [23:00]

It's not for everybody and it's probably detrimental to some people, but you know, if I didn't do mindfulness and it's got a physiological empirical evidence for God's sake that, you know, the amygdala does reduce in its activity, the insula where you have more focus on the body rather than the constant loop type of thinking.

There are things that do happen that you can reduce exactly what the problem is. It's as close as we've gotten to that piece of technology that says you're burning out, but at least you're aware you're burning out and awareness is everything. It takes effort to say, okay, I'm in trouble now. I'm going to stay in trouble because I need the money, but it's your conscious decision. This isn't to say chill out. This is to say step on it when you need to step on it. But at some point, when you go home or when you're on a holiday or whatever, you better come into the present, otherwise what's life worth living for? The problem is most people don't do it, but they go to the gym seven days a week.

Anna:

Yeah

Ruby: [24:00]

And so just by listening, who says that we can't switch on and off our cocktails, our chemicals by the computer? Of course it gives us the same stimuli as a human does. But ultimately we still have to meet and form a community and I think Frazzled comes as close as it can get before we meet in public.

Anna:

Yeah. Nigel, same question to you. I imagine it'll be a very different answer, but if our listeners could do one thing to help themselves feel better about the environment maybe, or to do one thing to help the environment, what would you recommend they do?

Nigel: [24:30]

Well, I think one of the things that we have to get much, much better at, to talk to Ruby's point earlier about, you know, resource extractions, we need to get much, much better at recycling. That's certainly an interesting area for processing that we've been embracing more and more within the company. So I think we need to get a lot better at that. There are a lot of huge scientific and engineering challenges associated with some forms of recycling. If you think about the computer, how do you extract and recover all of those elements within it? That's a very difficult challenge to do that cost effectively. So there's a huge, I think, opening there, an exciting period for science and technology to try and solve some of these challenges.

Anna: [25:15]

Absolutely. Thank you both so much. I've taken a huge amount away from this. I think the thing I'm going to try and do is to turn off my notifications and to notice when I'm reaching for that cortisol again.

A huge thank you to my guests this episode, comedian and mental health advocate Ruby Wax and Rio Tinto's Chief Scientist, Nigel Steward. Thank you both so much. Ruby's new book is I'm Not As Well As I Thought I Was and she's taking that on the road on tour in 2025. And that brings us to the end of this episode.

Anna: [25:45]

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