Implausible Engineering – Episode 6a: Staying Switched On

It's difficult to achieve immortality unless you also achieve invulnerability, since even if you don't age or get sick you can still die from a natural disaster, or a murder, or whatever. Indeed, the longer you live the more likely some unexpected calamity may come your way. So, if your only immortal up until the point that something goes wrong and you die, then you're not really immortal. So, all we can really talk about here are ways to stop ageing, so that you can persist, potentially inevitably if you can avoid natural disasters and murderers.

Ageing is a curious business, it's not like we have to age. There's a certain amount of damage and deterioration that comes from just persisting, but most of the cells in your body are replaced at different points in your lifetime, so the potential is there to keep you young indefinitely. But ageing is written into our genetic code, or otherwise it's never been written out – since to continue the species all we have to do is have children and then it's job done.

So, there is potential for pharmacological manipulation - a telomere preservative perhaps that could extend your lifetime a bit, or even a lot. But are telomere preservatives really going to keep you going for thousands or millions of years? That seems a bit far-fetched. In previous episodes we've discussed the option of putting your brain in a robot, as your organs starting to fail from accumulated wear and tear, but your brain is an organ too and isn't immune to such deterioration either. So, to achieve million-year duration lifespans, the best solution is to properly digitise yourself. This is more than just putting on cyber goggles or having a cable plugged into in the back of your head so you can have adventures in a virtual reality. You can do amazing things with cyber goggles, haptic feedback and interactive controls, but at the end of the day it's all just happening in your head.

But if you are digitized, then your digitized. Your memories, standard algorithmic thinking patterns and general behaviours are all coded and available to run on any platform. You have an independent existence even if your organic self unplugs and walks away. And of course there's the rub, you can be digitally copied, but it's your copy that enjoys immortality while you have to stay put in your mortal coil. It would almost be better if the doctors told you they were putting you to sleep before the copy procedure and then euthanized you before switching on the copy you with all your memories, right up to the point where you went to sleep. The real you would have been pissed if it knew that was going on, but if you just went to sleep just you do any other night- expecting a temporary oblivion until you wake up again, well, that's pretty much what happens.

But putting such philosophical conundrums to one side, it might be hard to replicate your emotional self in digital form, since so much of that is tied up with your physiological self. Let's face it, a lot of happiness and contentment comes from the temporary relief from discomfort and stress and many feelings of fulfilment are largely hormonal rewards for keeping your physical self fed and healthy and you know, reproductive.

So, all that suggests that your digitized self will actually need some built in flaws that can only be overcome by effort and persistence – so that you're always striving and just occasionally achieving fulfilment. Although, a more genuine need for striving and attainment might come from having to

convince whoever is powering the mainframe to keep it running and well maintained. So you might have to be busy and productive and even entertaining so that the powers that be will keep the power on. And to achieve that you might need to build a community of digitized others so you can collaborate towards achieving common goals. When you start thinking of it that way, it does start feeling like a real life – which could be immortal, at least until someone hits the off switch.

Implausible Engineering – Episode 6b: Hopping Universes.

The day is coming when our Universe starts winding down towards heat death and our by-then close-to-immortal descendants will need to find a fresh young Universe to continue in. After all, here we living in a Universe that apparently popped of nowhere, quite literally, since the whole idea of a Universe is that it contains spacetime, so whatever nothingness that it did pop out of had neither space nor time dimensions. There's no clear reason why we shouldn't assume that other Universes regularly pop out of the same dimensionless nothingness from which ours popped out of. All these Universes may live out their multibillion-year existence oblivious to the fact that other Universes are out there doing much the same thing – that is flashing brightly into existence and then slowly fading away into entropic chaos until the very last black hole evaporates.

Of course, hopping from our Universe to another is going to be challenging, as is first determining whether you will actually be hopping into a younger and equivalently-habitable one. It is possible other Universe's may be uninhabitable to us or other beings, just because their settings aren't right. For example, the fine structure constant might be set differently so protons, electrons and neutrons don't associate into atoms, or otherwise fusion doesn't occur at high temperatures and densities – which means no stars. Or maybe spacetime will have different tensors, so that you get spaghettified as soon as you enter another Universe. And who knows if you always get protons and neutrons cooling out of a quark soup. Just because it happened in our Universe doesn't mean that's how it will always work out. Although, it is entirely possible that that is the way it always works out. We'll just have to see.

Anyhow, to make progress here we first need an extra-Universal probe that can drop out of our Universe, find others and then report back. This is tricky since you'd think it first has to get to the edge of our Universe and then continue on. That is tricky since even travelling at light speed won't get you to the edge, which we assume is by now moving away from us at a cumulative expansion rate that well exceeds the speed of light. So, you really want a probe that can somehow just drop out of our Universe into the dimensionless nothing from which our Universe arose and then some transverse the nothingness to reach those other Universes. This all seems pretty unlikely, even implausible you might say, but if you can manage to get a probe out there then following it across yourself should be relatively straight forward.

One solution suggests itself from the hypothetical geometry of wormholes which are often portrayed as narrow tubes of spacetime which seem to project out from our universe and then loop back to it at another point. That seems like a potential short cut out of our Universe whereby rather than entering a

wormhole you just punch straight out through spacetime into the dimensionless nothingness that those wormholes presumably extend through.

Here we are oversimplifying things a bit, since spacetime isn't a two-dimensional surface they way it's often portrayed in science documentaries, so you don't so much punch through it as to extend its four-dimensional curvature to such an extreme that it kind of breaks or at least can no longer contain you. Getting to that point would involve a huge degree of spatial contraction and time dilation, so the probe and later the crewed vessel would have structural integrity challenges, but hopefully whatever mechanism you use to push through spacetime can also work to protect your vessel. The time dilation part means that, since you have to send the probe first, you'll have an awful long wait for it punch out, perhaps millions of even billions of years, even though it will seem a relatively quick process to it and later to you if you then follow it. So, it's just as well our descendants will be close-to-immortal when they attempt all this.

On the bright side, Once you or your probe are out in the dimensionless nothingness you would no longer be crossing distance over time – since no such dimensions exist, so regardless of what span of nothingness may between you and an adjacent universe it would take no time to search and find it. So, if there are other Universes out there, there would be a seeming inevitability in you finding them as soon as you started looking.

However, it's unclear how the structural integrity of either your probe or a subsequent crewed transport vehicle will fare within dimensionless nothingness – since we are normally accommodated within the comfortable curving spacetime of our Universe. Out in dimensionless nothingness you and your vehicle might be crushed down to single point, or otherwise spread infinitely outwards – since there is nothing out there to accommodate anything that is something. Once again, the trick is to send the probe out first and if you never hear from it again, then you'll know it's time to embrace the oncoming entropic chaos as your Universe draws to its close.

Nonetheless, it is clearly true that Universes manage to barge their way into or out of nothing depending on your perspective, so perhaps you just need to trigger a small-scale quantum fluctuation that would allow your probe to punch out of our spacetime and then float through dimensionless nothingness within a bubble of super-positioning, where it's both there but also not there. Since it is in nothingness there's no danger of an external observer confirming whether it is actually there or not – and since it's in nothingness, the whole experience will have no duration in time anyway.

So that's it really. Build your probe, trigger a quantum fluctuation, the probe punches out of our Universe, preprogrammed to do the same thing in reverse upon its return leg. Then if it does come back, with good news about an adjacent young and existence-friendly Universe, you just follow its trajectory, punching out and then punching in to your new home an instant later. Implausible? Sure. Worth a shot? Absolutely.