



* The silence of the bunker.

/ Well, I'll introduce myself first then. I'm Rebecca Levene. I'm a writer of speculative fiction, but I generally get called Bex, so if someone's talking to Bex, that's me.

□ I'm Kathleen Bryson. I am an evolutionary anthropologist who sometimes also writes speculative fiction as well.

* I'm Stefan Lorenz Sorgner. I am a philosophy professor at John Cabot University in Rome. I established the world's first academic journal explicitly dedicated to the Posthuman, the Journal of Posthuman Studies.

○ My name is Volker Sommer. I'm a primatologist. That is, I work with monkeys and apes, including human apes. I'm interested in evolutionary theory.

* The evolution seems to be important aspect, which brings us together. Evolution with respect to technological possibilities by means of which we challenge the boundaries of currently living human beings. That seems to have to do something with the trans-human.

/ Although I'd make the claim that fiction has been the driving force behind the trans-human movement. That a lot of the goals which the movement is moving towards were first conceived of in fiction. That actually it's what we imagined first, that we're now trying to make possible, but maybe you wouldn't agree with that.

* I don't know whether it's just one driving force. There's so many ancestors of this well of the trans-humanist thinking and you can find it, also, many religious thinkers in the beginning of the 20th century in Russia were very interested in this thinking, but also science fiction writers of course. Belyaev for example, is an amazing driving force, I think.

/ And then the entire cyberpunk movement, which is out of fashion right now, but-

* Exactly.

□ You could go back even further. Obviously you could go back to the development possibly in mammals. I'm not even talking just hominins or maybe not even great apes. It's symbolic thought being present, which allows us to be able to speculate in this way as well. I don't think of it at all as a new development. Religion is not at all a new development.

Volker could probably talk more of it, but there's indications of symbolic – potentially ritual thought – in other great apes as well. This would allow us to have the capacity right from the beginning to speculate, to use tools, so I don't think of it as unnatural or a new development. I think it is part of ourselves as animals.

Kathleen Bryson □
Rebecca Levene /
Stefan Lorenz *
Sorgner
Volker Sommer ○

○ If I think about “trans”, I would want to question human boundaries to – let’s say – the side of the human–animal boundary because as an evolutionary biologist, well, I am clearly an animal, and in that way connected with all other living beings. Looking ahead, the other “trans” relates to how we will be intermarrying with inanimate entities, machines and such. So, I would like to interrogate the human/animal boundary as well as the human/machine boundary.

□ Just to comment on that, I’m in general agreement but the issue I might have with that is the proceeding along a spectrum line as opposed to a holism. Because that’s a spectrum from left to right, and it implies directionality, which natural selection is not. This is one of the issues I sometimes have with trans-humanism – evolution is not directional at all, so we don’t often... I don’t know if it’s possible, and I’m obviously just thinking on my feet right now; this is not a developed theory, but if we could somehow have a holism that incorporates our animal selves, maybe our machine selves, maybe ourselves as we find ourselves today, that might be a different way of conceiving rather than a spectrum.

/ That’s interesting because one of the things I was going to say is that I think that that sense of intermixing is usually conceived of as corrupting in both directions, in fact. You get things like *The Island of Dr. Moreau*, which is the horror of human and animal elements mixing and then cyberpunk itself, which is the predominant trans-human genre, is a dystopian genre. It imagines everything going wrong when we start mixing ourselves in that way.

I think maybe if we could conceive it holistically, we wouldn’t see it as a corrupting influence to mix ourselves with the other.

* Actually just the notion of the trans-human is not so predominant within this trans-humanist discourse. What is used actually more often is the posthuman. But the notion of transhumanism is fairly new. It was only coined in 1951 by Julian Huxley, who was also the first Director of the UNESCO and was responsible in establishing the declaration of human rights or was involved in formulating the human rights.

So it’s only been 70 years where this notion was attached to this way of thinking. But yeah, in general, and I think this is what makes it such a dangerous way of thinking is that it’s a new conceptualisation of who we are as human beings in the sense that it breaks away from our Western tradition, the Western cultural tradition, which always thought, well, it’s a rational, immaterial rationality, which makes us special, which makes us... We are the only ones, humans are the only ones, who possess the divine spark, who are categorically separate from the rest of the natural world.

Only since, well, with Darwin, with Nietzsche, with all these thinkers, it’s become more and more important that we are fully part of the natural world order. We’ve come about as a consequence of evolutionary processes. So there’s a chance that of course we can also die out or we will develop further eventually. In 400,000 years, it’s highly likely that we as human beings, homo sapien sapiens will no longer exist.

Now together with the possibilities of emerging technologies, it's become a need to discuss the limits. How we are supposed to use them? What that means to us, our self understanding as human beings.

/ Did you think some of the trans-human movement is to do with wanting control over that process of change? I've been thinking about this a lot, about the sense that one is given a body but doesn't choose it, because I, at the age of 50, I chose to have a tattoo for the first time and I was thinking about what motivated me to do that.

It's about something I decide about my body, I put it there, and nothing else about my body was decided by me. My haircut. I wonder whether that sense that we don't know what the selective pressures on us are now. We don't know what we're going to change into. But the trans-human movement says, well we can do this, we can do that, and we can direct that. I don't know if that resonates with you at all.

* Yeah, we can do that. But in a way we've always been altered. We've always been altered not only by ourselves but also in particular by our parents. The first upgrade which we got was what basically the upgrade of language that makes us turn into, cyborgs, cybernetic organisms and a cyber stands for the steersmen of the ship. So we've always been altered organisms as human beings.

Once the parent starts to upgrade us with language, that was the first upgrade. The next upgrades were all part of educational processes, mathematics, history, this is all alterations and these alterations, some of them have also altered our genetic level by means of epigenetic processes. Genes were turned on and off and how the genes were located towards each other. Environmental changes have always had an effect also on our genetic level.

□ But some people might argue then... I agree, but also those changes that you're calling upgrading; they are in essence replacing biological processes. They're still part of the sum of ourselves as animals. I don't think you're not arguing against that anyway.

It's maybe even something like the incest taboo in human societies, where we have a cultural function that allows us to avoid inbreeding even if we possibly don't necessarily have a biological function. But the end result would be the same.

Culture is the tool, which is what I think you're getting at, culture itself – which would include the linguistic capabilities – is the tool that allows us to then react to our environment, survive and reproduce, et cetera.

/ But since then, since as Volker argued, which I totally agree with, animals have culture. Which suggests one can really meaningfully talk about transcorvidism. Because the same process goes for them.

□ Or more likely dolphins potentially, because at least we've had some cross-species communication using their system and not just ours. Or in bonobos, where there at least have been attempts for us to communicate, not just on our own terms, but in their terms.

/ But the corvids have culture. They teach their offspring things they would not automatically develop.

□ That's correct.

/ You would say that is a trans-corvid enterprise.

* There's this widely shared prejudice that what trans-humanists desire is just to turn into Superman on Viagra or Wonder Woman with Botox. There is this element in trans-humanism but actually many more of them argue for also a wide plurality of choices to promote diversity and plurality by means of new technologies.

For example, there is no reason in the end why incest should be illegal. That's a nice example actually. Incest now, that's such a widely shared taboo, but once now we've established sort of autonomy as a fictional norm. It's a fictive norm. It's a wonderful achievement that we've got the freedom now to not to be... The religion does not have the right to tell us how to live our good lives and now we can make a decision and it could be contract that brother and sister, father and son, as long as they are competent adults, decide to have sex together. Luckily this has already been recognised in countries like Spain, where incest among competent adults is legal.

□ Actually, I'll just add you're arguing quite differently as I understand it. What I was saying is the society still would have the taboo and that would then function the same way, like being able to sniff out their MHC and be able to tell, I'm *this* related to you. Which I actually think we can do anyway. Because there seems to be some recent studies that in the last three weeks, have said that we actually can do kin recognition at that level.

But incest, leaving aside the fact as consenting adults, which for me I'm still quite personally squeaked out by the thought of, but the society in this case would be the ones who are the gatekeepers, but it's still functioning as part of a biological process because it's the environment to which an organism is reacting.

I'm not saying society is always right about these boundaries, but it would be replacing a... Our culture becomes a prosthetic itself. It becomes the culture, which is what I think you were saying initially. It's the culture which you were calling the upgrading, which is the extension.

/ I suppose my concern, I totally agree with you with diversity, but my concern about a lot of what I have read of trans-humanism is that it's quite a libertarian project. It's about individual choice, and increasing it is great, but we are fundamentally a social animal and unless we elevate universally or change universally, I think this causes problems. And also obviously raises issues of access and equality.

* Actually, it's the way the public media is often represented, identified with many of the Silicon Valley entrepreneurs. There are some problematic people who they favor of trans-humanism but actually they are seen as problematic within the movement as well.

There's, for example, as a counter position, the Institute for Ethics in Emerging Technologies and most of the people involved in there are rather social democratic trans-humanist. It's something even like have some association with rather communist understandings. They all still remain on the liberal basis.

□ In that case the boundaries are intercultural within the trans-humanism.

* Exactly.

□ So there are, then again, it's fulfilling the function of – not gatekeeping, that is not quite the word but monitoring is not the word either. *Reigning in* the worst impulses potentially of what we might have a tendency towards as animals who can't really look that far into the future.

* People claim trans-humanism is only for the rich, and that it will lead to massive gaps would between the better off and the worse. Basically the Gattaca example. It will lead to a split in human society. Many are extremely worried about this and that's why there arises the need to talk about the possibilities, how to make things accessible to-

/ Also in terms of potential apocalyptic level dangers for human society that we as a society as a whole should decide about. I believe there are tech companies in Silicon Valley who are overtly working to bring about the singularity. That is not something we should think about without discussion. It shouldn't be one group of individuals that choose to make so massive a transformation.

* Singularity is the idea usually associated with the idea that a human personality gets put on a hard drive, mind uploading as an option. It's important to stress, well this silicon-based transhumanism is not what all transhumanists have to affirm. There is a carbonate based transhumanism as well as a sili-con-based trans-humanism.

I for example think, I don't even think mind... We don't have any reason to believe that mind uploading would work because our personality, if it was possible to put it on a hard drive, then we would want that nothing gets lost. However, so we would have to still be alive in a digital version. We would still have consciousness, but so far we don't.

There is no silicon-based entity which is alive. Because even the best example would be a computer virus, which is a self-replicating entity, but even that doesn't have metabolism, which we would demand, ask of life, and so all the arguments in favor of mind uploading singularity, they are just a way of getting media attention and they don't have any practical relevance.

/ Although, we haven't solved that. Obviously we're nowhere near solving the hard problem of consciousness. We don't in fact know if there will come a time when we produce a silicon entity that it becomes spontaneously conscious. We just can't know because we don't know what produces consciousness. We don't know what the link is between matter and consciousness.

□ I felt quite reassured. I cannot remember who the scientist was, but reading, I think it was a *New Scientist* as well, which is basically my version of *Cosmopolitan* magazine when I want to relax, but there was an article about how most of the mechanisms in evolutionary theory regarding cooperation and reciprocal altruism would also kick in anyway with complex systems in terms of costs and benefits. I felt quite reassured by that.

Anyway, I thought, well, even if this does happen, then actually it would be following generally the fundamental laws of physics and probably cooperation will always, as I said, if you're social, will give you the greatest benefits.

Now it might be being social in a very different way than what we're used to, but our experience so far, not just with ourselves, but with other organisms who are social organisms, is that cooperation is generally helpful as long as you get a benefit for yourself.

/ But don't you think being embodied is quite fundamental to our nature, and that we can't begin to imagine what an un-embodied consciousness would be like?

□ Yeah, that's why I just gave the caveat to that I don't know what it... It might be very different, but maybe I was self-deluding, which is also a human trait – to feel reassured.

/ Yeah, that's true.

□ It's like, as long as reciprocal altruism kicks in, it's okay.

/ That'll be okay.

* We cannot exclude the possibility that it will happen eventually, but all of these prophets who claim, like Kurzweil who claim it will happen within the next 30 years.

/ We can't know that.

* We have no indication for that happening.

□ That time is ticking and I was thinking...

* It's not. We've got really urgent challenges to deal with, but this is an interesting issue to think about, but technology leads to other challenges which we urgently have to confront.

/ I think some of the focus on the singularity is an artefact of despair as well, that we feel like our social and environmental problems are so insoluble we need something smarter than us to sort them out for us. I think that's where some of the drive towards it is coming from, a distrust in our own ability to solve our own problems.

* In particular ones we see nowadays are developments associated with digitalisation and RFID chips entering all aspects of our life world and together in particular with the development in China, which I find absolutely interesting.

□ I went to... What's his name? Phil Ball, I went to his book launch a couple of weeks ago in London. That was interesting.

/ Can you tell us?

* I think well firstly Chinese, they actually embrace the latest technologies, both with respect to digitalisation as well as with respect to genetic modification, CRISPR-CAS9 genome editing. From 2020 onwards the social credit system will be universally applied in all over China, that's already in place in some parts of China, which basically on the basis of your actions and all of your digitised action in particular, you receive a specific social credit, a value; once your value is too low, you are banned from booking flights, train rides, four and five star hotels. You're being offered less possible partners on the Chinese version of Tinder.

It already has a lot of practical implications. For example, there was a young boy who passed the entry exams to university, but his dad didn't pay back his credit. That's because they are employing a relational ethics. It's not who you is responsible, but also your friends' activities have a relevance, a bearing on your value. So his value dropped and he was not allowed to study because his dad didn't pay back a certain credit and only after he paid it back he was allowed to enter university.

This will be employed nationwide from 2020 onwards and together with chips entering all aspects, permanent surveillance, surveillance cameras, all your financial transactions. That would have a massive influence on-

/ This sounds obviously incredibly dystopian and none of us want to live in that system, but at the same time I could see that in a sense it's trying to reproduce, I'm totally blanking on what the number is, but I'm sure you all know that the number-

□ Dunbar's number.

/ Dunbar's number. That none of us live in Dunbar communities anymore, and this sounds like a way of trying to create a digital version of the social sanctions that come from living in a Dunbar number community.

□ It literally, I'm pretty sure there's a *Black Mirror* episode that maybe they're getting their inspiration from this. I'm pretty sure I remember that they really are.

/ 10 million credits, or something.

□ But it also – think about what happens. Maybe three or four years ago, I remember I was very hesitant, and even in early days of the Cloud, I was quite reluctant, but my skepticism has always proved true about how unsafe stuff was when it was being uploaded, how much of my information is being shared with others, and I am not particularly keen about signing up to any program that requires that I check in through Facebook, et cetera.

What about people like myself, who might want to opt out in such a situation in China? What happens if I don't have a digital footprint?

* You can't.

□ I can't, so then I have low numbers because I.... That's problematic to me.

* In a way you can't opt out of Facebook because if some of your friends are on Facebook and they take a picture and you're on one of these pictures, they have a specific... They have you in Facebook as an identity without you being on Facebook. No, there's no way to opt out. In particular in a system like China, where it has legal consequences. Just by having any kind of number, insurance number, health insurance number, you're already within the system.

□ No, I'm aware of that. But there's levels of involvement and so what's curious to me is that it's the – which is what I objected to several years ago – it's the tacitly *goad*ing me into having to participate when I do not want to participate, or sometimes I do want to participate, and so that is also extreme social pressure, not just in how you relate to it, but the initial act of saying to a person, "If you're not participating digitally, then you're not part of our society. You're not social."

/ Well, it's because in many ways we live in a data economy and we generate value through the data we generate and that's what...

□ Yeah, I understand what's behind it.

/ But what I'm saying is, I don't know how you escape it when that's what society wants you for now.

□ I am curmudgeonly is how I deal with it. I'm aware that I am a set of data points and I sometimes try to screw with it or hack it. Subvert it.

/ But it's difficult isn't it? Because, like you're saying, other people are providing data on you. It's not just you who's doing it.

□ Probably they have a prototype of a subversive personality like myself who would be prone to doing that, that just fits their predictions for a Kathleen-type.

/ There's an algorithm for that.

* Now, let's see the positive sides of this. Actually, there are a lot of personal interests related to the digitalisation. When it comes to the psychological studies, for example, is confirmed that more than 90% of the people identify a longer health span, a longer lifespan during which we are healthy, with a higher quality of life.

By collecting personalised data, it is possible to identify what are the correlations between our lifestyle and the likelihood of getting certain diseases, our genes, and all of the company. Companies and countries they all want our genetic data. In the US we've got a private market which is like 23andMe, and they've got more than 5 million clients who have their genes analysed.

In Estonia, they've made the arrangement, well we, as the government, we want to support you getting to know you better, so we will pay for genome analysis if you share the results with us.

In Kuwait, they had a different solution and they made it for some time. They've abandoned it now. But they made it for two years, I think it was legally obligatory for all the visitors and for all citizens to deliver a tissue sample.

All the same motive. They all want genetic data. Why? The more data we have, the more we can see the likely of getting certain diseases, how we respond to drugs, which capacities we have, and it has some problematic implications. So potentially very problematic implications. On the other hand, the more information we have the more we can influence that and the more the likelihood of our expanding our health span. But again, that's a strong human interest.

□ A counterpoint to that might be, for example, with NHS Digital in the UK to which I opted out of sharing my information, has now been sold to a private company. It was a communal resource initially, the argument could be made, which I still decided at the time I did not – ironically, my postdoc recently was trying to convince people to give me their digital data in order for a very good project about wellbeing. But at a personal level, I did not ever allow my... And I might be coming from a, I'm not going to say how long I'm going to live, but I'm from a very long-lived family, so I'm not particularly concerned about that because people tend to live to 94, 95 in my family and so that's possibly feeding into my cavalier attitude.

But I think there's problem, the fact that the NHS then said they would not – or *alluded* that they would not – share the data, then has sold it and is in the process of selling it to American hyper capitalist institutions, which are monetising it, is problematic.

The motivations might be very good and very useful. Like for the postdoc project I just worked on, it's amazing that you can get this digital stuff and it will improve people's lives if we can show these particular links.

But on the other hand, the capacity for social cheating is a problem and this is what posthumanism probably is more adept at negotiating – but transhumanism perhaps not to the same level – of how to deal with social cheating. Which goes back to what you first said about certain groups of people exploiting the best instincts of us.

★ The issue with opting out... I'm not happy about the total surveillance. I've tried to avoid it. However, I'm also considering what is the implication concerning possibilities of making social research based on scientific research based on data.

In Europe we've got a very good universal healthcare system. Healthcare is very expensive. In the US, companies had the possibility, for some time, to even patent genes; there was a patent on the breast cancer gene, so anyone who wanted to have an analysis would have to pay them whatever money they want.

In a way it makes sense. The company has invested a lot of money in order to find out the information and it's a very risky research. They spend a lot of money and not many drugs get FDA approved and so on. That's the underlying logic for keeping the intellectual property.

To finish that, on the other end. In a way, if we give away these data about ourselves, that could be a way for us to financially supporting the universal healthcare system. It's a way, because we deliver the data, so we keep the rights on some of the results. So the companies don't have the right to charge whatever amount they want.

/ I do take that argument and I think some of the backlash against big pharma, it doesn't take into account the fact, as you're saying, it's very expensive. But I think the trouble is, as part of late capitalism, the same process goes on that went on with mortgages where they chop it up and they sell it on again. Then having access to the data that allows them to develop drugs, great, but then them selling it to an insurance company that decides to increase my premiums. As soon as you don't possess your data, you lose all control over it and then you have no say in who uses it.

□ Going back to a point you made, I have actually spat in the tube, but not yet sent off my 23andMe. In a way, I don't have to. My mother, two of my brothers, my father, my uncle, and four first cousins have done it. My data is practically there either anyway and I have had no choice over that. I will probably send off my kit, I'm still quite interested, but my choice has been taken away from me.

/ I feel like I don't participate in a lot of social media, but I still feel like I'm like the Mandelbrot man. The very void that is me is defined by all the noise around it so I can't escape description in this world.

□ Now my genes have become the description around me... Would you not say that's the case? It's there.

* Of course it's there. That's the thing. If when takes a liberal solution and says, no, well some one person acts, or your brother has the genes analysed, and so they got the results. Do they own the results themselves? If they own the results, then they could put it online to make it generally accessible.

However, you are sharing most genes with them. So basically if they put it online in the end, some insurance company could get hold of it and they say, "Oh no, these genes don't look so good. We don't want you." Or potential employer in the future, says, "No, with such a high risk of getting a stroke..."

/ Or immigration surveys. It feels dangerous, but inevitable, I think is the problem.

* Exactly. Inevitable. Well, because it's important for making research. The other element is actually, so in the US, data is collected privately, but in China they get even more information because it's enforced and because of them getting all the information and because of the dependency of scientific research policymaking, other interests with it.

In Europe, this information is also needed for these purposes. So do we then have to pay the Chinese the money for making research because the data's so fundamental for any use in engineering, for using precious substance? From any kind of working, it will be even more important. So, that has the consequence that they are making more money, they are getting richer with respect to us. So, we will see a socioeconomic decline in Europe, and we've enforced to give up the data. Now, this is sort of...

/ Is that how you see the trajectory going? Do you think that's quite likely?

* I think that's very likely.

/ Yeah, I do too.

* And as a consequence, we will claim minority groups, immigrants, any kind of minority groups for that socioeconomic decline in Europe. That will lead to tensions within the groups, and particularly in the first instance it will concern of the middle class. They will find some scapegoats. And so, this will be minority groups, tensions increase and that will lead to civil war. That's the future of Europe.

In Italy and in Rome, we'll be the gladiator dancers for the Chinese visitors. And the only reason why the Chinese will come over is because of visiting Louvre and the Colosseum and enjoy the pizza, but not for scientific or economic reasons.

/ But I think, and I don't want to be in any way justifying the Chinese system of government, but if we start giving our data off over here, we won't be giving it up to our governments. We'll be giving it up to private mega-corporations. I don't know. Is that... At least a government is acting collectively for a people.

* Maybe that's what we have to do then, from a liberal perspective. At the same time we need to promote freedom much more than it already exists. I mean, much more. But on the other hand, allow a way of governmental surveillance... A European social credit system where surveillance is being done by computers, by algorithms then, in order to restrict the access of humans having access to the data.

And that's one of the greatest risks associated with it because in governments, people in charge, they will all be corrupted eventually. They will use it against you. So, the way to limit the access and the limit of who they can sell it to, these are some of the tricky issues which...

/ It comes back round to, I think, the appeal of the singularity, is the sense that if only there was some dispassionate, disinterested entity we could pass it on to, great things could come of it. But there's no human-created entity we trust with this much information.

□ Because of the cheating issue.

/ With the cheating.

* Corruption...

/ And because of the profit motive, which is...

□ Which is cheating. Social cheating.

* And that's the reason why I think the American version is not in our interest. I mean, because in there they've got the liberal worlds instead of the companies have the right to collect the data. But the more data they get and the more they get exchange data, they will in the end turn into a political institution, and political because data is power and power...

I mean, they can influence then, political... That's not what we want. So, if there's a need to collect data, if we want to keep it some sense of justice, then it would have to be done by a governmental institution now.

□ At an opt-in level, I would suggest.

* This is a tricky issue. No, I would want that too. The sort of, is that realistic? What would be the opt-in level then, to those who don't subscribe to it? Don't have a universal health insurance?

□ Well, my information-

* I would have to pay a higher charge. I mean, this basically...

/ The trouble is this is all coming at a time when there's increasing and quite justified distrust of government as well – all across the world really. I know another word is populism, when a populist government have access to this data. When you give it to a government, you give it indefinitely to everyone that ever gets elected and you have no control over that. And I don't know what the answer is.

○ Let me lean back.

/ All right.

○ All right. Everybody lean back.

□ We're leaning in.

○ By now, we have talked for half an hour and I kept a little bit of a record and want to go back to some key words, to recap. There were enticing terms I had never heard or thought about, like trans-corvidism, which I find very exciting. The reasonable assumption that other types of animals – crows, elephants, whales – may also one day develop a type of thinking that transcends their current embodiments.

That train of thought rang a further bell for me, about Julian Huxley who, if I am not mistaken, first coined the term transhumanism...

* Yeah, 1951.

○ And Huxley also invented another interesting term, evolutionary humanism – which aligns even more with my own interests. The idea that while we are necessarily humans first, with our restricted perspectives, that we shouldn't forget our enmeshment with other creatures, animals, plants, protozoans and therelike. With all of them we share a much longer history, a deep time, an evolutionary history, more extensive and complex than our relatively small historical existence as fellow human beings. In fact, there was a much longer segment of pre-human history than human history – while the trans-human part has hardly begun.

Another pair of words that piques my interest is eugenics and eutechnics. Quite simply, evolution represents a eugenic process, always reshuffling genes, being pretty cruel to the less competitive units, so that most everything that exists and procreates is amazingly fit, both physically as well as genetically. And today, armed with our brains, we have eutechnics at our disposal, methods to meddle with our reproduction and our genetic make-up. Of course, while “Eu” means “good”, biotechnology only holds a promise of actually being good, in an ethical sense. Albeit the dangers are immense that such promise might be broken.

/ I'm not sure I'd sign on to not making a distinction between evolution and eugenics as we understand it, because I think eugenics is a birth and imposed directionality decided by humans.

○ That's okay.

/ But I suppose, because I'm Jewish, that that's quite a difficult question for me. And the idea that the eugenic movement was merely copying evolution, I find quite problematic.

○ I should have more clearly distinguished between the technical term eugenics and the history and ideology of eugenic applications, especially in the 20th century, with all its murderous consequences. Still, most of us are at least implicitly eugenicists, when we aim to better our lives and that of coming generations. This includes many members of Jewish communities, who have their genetic make-up checked when they want to produce children together, to assess the chances that their kids will be healthy, and not suffer from inherited blood conditions such as sickle cell anemia. This resorting to blood screening is a eugenic procedure, never mind that the term has been tainted.

□ I object for... I mean, I generally sign on to your summary, but I still hold what I made with the very first point is that I do not feel there needs to be this dichotomisation between pre and future. I think there must be a way of conceiving of this in a more holistic way rather than a spectrum. I know that we're limited because we think in spectrums, and we think in directionality, but maybe that would also come into this idea of eugenics, which I'm not comfortable with the word.

/ I'm not loving your suggestion that eugenics is always, even in that sense of wanting health fit people, is unproblematic. I mean, the deaf community might take issue with that. They very strongly feel that they're being wiped out through that kind of selection.

* Not all of it. I mean, the deaf community is at least split-

/ Some elements in that community, yeah.

* ... in two parts. I mean, on the one hand, some claim that deafness is just being different. Others might claim it's a handicap. But in order to claim healthcare benefits, because otherwise if it's just being different, they wouldn't be supported by the healthcare, which is again the financial aspect.

But that's an interesting question which is also quite discussed as part of these discussions. There was this deaf lesbian couple in the US. They're both university professors and they argued in this way, in that deafness is just being different. We consciously want to have a deaf child. And I think because deafness is a being different, actually in our circumstances, we teach at the university where mostly deaf people are. It's actually an advantage.

And so, they consciously selected a donor from the deaf community in order to increase the likelihood of the child being deaf.

And I think that's a perfectly... If we take seriously the notion of otherness, if we take seriously the notion of negative freedom as an achievement where parents can certainly make educational decision. Also, that one can decide who to have offspring with, and here the offspring is not harmed because the offspring wouldn't be there. It's not taking something away.

And so, the technologies involved in order to consciously select a partner here or increase the likelihood of the child being deaf is a perfectly legitimate choice. And this is something...

/ Yeah, and definitely it has own culture. I mean, sign language is a language unique to the deaf community, or in the past to the deaf community.

○ But when you consciously want to have a child with certain traits, let's say, being deaf, and thus enrich the society, that would technically be eugenics. That is all I want to say. I'm not defending the abuse of the possibility to prefer certain human beings over others.

/ No, I'm not. I wouldn't suggest for a second you are. But what I'm saying is that I think that there is a divide between the random choice that goes on in evolution and eugenics, where you are making moral decisions about what should happen.

○ OK, you echo what Kathleen was objecting to, when she pointed out that evolution doesn't have a direction. That is true if we are looking forward, albeit in hindsight, evolution did have a direction. So, you can only ever-

□ In hindsight.

○ In hindsight, yes, there was a direction, one particular one that happened at the expense of multiple others that did not take place, one historical process that was the result of how the game played out.

But even if we look forward and can't exactly predict the course of evolution, there will be specific constraints as to what is not likely to happen. For example, it's very unlikely that within 5,000 years or so we will evolve wings, because our anatomy is too shoehorned into other dimensions. That is some sort of directionality, which is not a progression, and course, and not entirely predictable. However, de facto, there will be a direction. And so-

□ Yeah, I do sign onto that. Progression is perhaps the objection I have.

○ I agree, nothing goal-directed.

□ I object to the goal-directedness. A goal at the end, which I think is often influenced by our own present culture's biases about what prototypes look like, what a face should look like, what a human body should look like.

These are our own biases and you could argue, well, there are certainly... Evolutionary psychologists would argue where there's tendencies...

I have read a lot of those evolutionary psychologist papers and there's a lot of just-so stories behind a lot of that. Some of it may well be a tendency, but we have so much variability that, like the deaf lesbian couple, that's like a bumpiness. These are the variables that make it unable to be predictive, I think. And that's why I'm thinking if we could... I don't know even if we could have a non-time-based way of conceiving of this. This is...

○ That's an interesting tension. Calling the biological process the result of "selection" is problematic term, because it seems to imply that a rational force is at work. That's not at all implied, but because it seems to be so directional, in hindsight, it has the appearance of being rationally designed. Biologists therefore call it "quasi-rational", and instead of "teleologic" call it "teleonomic", meaning, it only looks like as if it was moving towards a goal.

* I would object to selection being a rational....

○ No, there is not, of course, rationality, it just looks as if.

* There's not, no. Because selection, and that's the issue with... Eugenics has always the connotation with the Third Reich. It has the connotations of being institution making a choice, the political system making a choice. That's not what we're talking about at all nowadays. That no serious person would want to have such a structure. We talk about now, individuals making a choice for it themselves and parents making a choice for their offspring.

○ Yes, but you pointed out the danger of private companies exploiting that, when we cannot opt out but will be opted in. And by the way, we most likely agree that we shouldn't opt out to have our kids in school and probably agree that we shouldn't opt out to have vaccination.

□ I was not arguing that we should not say yes to vaccinations, to public schooling. I want to be allowed to opt in and opt out on different levels. That's what I'm asking for.

○ That's okay. That's....

□ I was arguing for variability.

○ Well, perhaps at the end we should allow that Leviathan of Hobbes, which is the state, to somehow make the best decisions, instead of allowing private companies and moneymakers to do it. That doesn't mean that there won't be conflicts, which we will need to negotiate. And so, different from the direction of evolution which we only recognise and understand post-hoc, we might want to work in a certain direction, pre-hoc, that leads into the future.

* I mean, I hope instead of the governmental influence, we will only relate to maybe something which is widely shared, like health issues, health spending, health spends, otherwise, freedom, negative freedom, absence from constraints or anything, this is such a wonderful achievement as a consequence of the enlightenment process.

We have the right to individually decide according how we want to live our lives and not to be told by religious leaders, by political leaders this is I am... My state, my religion, this is how you have to live.

○ But you are contradicting yourself, because you said that health and to live a better life is intrinsically tied to-

* No, not intrinsically.

○ Okay. This time-

* Widely shared. That's very important. Only that-

○ But what is widely shared? How do we decide? Should we via our institutions reign into people's bodily lives, through health care. The concept of being free then becomes very abstract, as our existence is tied into a body. Liberty might just be there in consciousness.

/ To me, the problem is not about boredom. It's about the fact that we are all social. And even individual freedom is not... Our individual choices are not made in a vacuum.

○ Yes. But social norms can also create terrible things.

/ Yes. No, absolutely.

○ That problem will always be there. Being social creatures doesn't ensure we don't do morally despicable things.

/ But that's what I'm saying. That's why I think being utopian about individual choice can be a bit self deceiving, because it won't be a freely made choice of out of rationality. It will be constrained by social structures which can be deeply harmful to certain subsections of the society.

○ There is hardly an escape. The values to which we ascribe will be rather random, and may simply signify that we belong to a certain group and not another. The values are not intrinsically good or bad. They are just good or bad from certain historical perspectives.

/ But it becomes dominant, I think the... And I agree with your idea of negative freedom. It doesn't impact others. One, as an adult, should be free to do what one chooses with one's own body. I think that's foundational to my belief system, but some of these changes one talks about making were inheritable.

And so, it's not just a choice you're making for yourself. It's a choice you're making for your children. Then it becomes a public matter. It's not a simple individual choice, unless you think you have the absolute right to make those choices for future generations. I don't know what the answer is. I just... the answer there is.

○ I don't know the answer either, only that there will be conflict.

□ I also don't know what the answer is.

/ Maybe you do. You might know all the answers.

□ Let me check then.

* The way I deal with that, we look for... If we are confronted with new technologic challenges, we should look for structural analogy with which we've had more experience in the past. So, for example, if we talk about genetic modifications, and there are good reasons why instead of by means of...

If people want to have them done to themselves, I think that's not so problematic in most instances. There are always some problematic cases. It becomes problematic when parents are making decisions over their children's genetic modification. But we do have experiences concerning such procedures with respect to education. Education can have irreversible consequences as well as reversible ones.

So, I would suggest actually in the same way, the same norms as we have in education, we should apply to the issue of genetic modification.

○ But will you do that?

* And so, there are some changes which are morally wrong and others which are morally legitimate. So we, as a society, need to decide what is morally legitimate. We need to decide when it becomes child abuse, this is when it becomes something which we don't want.

/ In the same way that we don't allow sex selective abortion. That's not permitted, but there are... But I think people might find that a hard pill to swallow, the idea that their choices about their child are something that actually have to be made collectively. I mean, I totally agree with you, but it can be a hard sell.

○ There you seem to almost buy into hardcore eugenics movements, with the ill-informed approach that societies should conduct selective breeding in a structured way, taking away personal liberty. So, how do you get out of that danger zone?

* I mean, education can go wrong. Some people don't like the way you're taking two piano lessons.

○ Of course.

* But in general at least... And then, there are some procedures where the risk is too high. Obviously that's when the government needs to enter that, these are changes which parents shouldn't have the right to make. But on the other hand, still that is part of the educational freedom of the parents. So, even in that respect, I think plurality and freedom are quite a precious achievement which should have a lot of potential, and possibilities should be allowed.

○ Such a very general vision will not help to draw up laws.

/ You're saying it should... And I think I agree with Stefan. You're saying it places limits, but it doesn't... It's proscriptive and not prescriptive basically, is what the government should do on those issues.

* Exactly. Only when something becomes really problematic and clear, then this is something where the government has to enter and say, no, this mustn't be made. But otherwise, parents have such a wide range of possibilities as part of the education process as well.

□ In an idealised sense. I mean, we have huge, huge problems with racism, sexism, et cetera, that are permeating our educational processes as well. All of the prejudices that we have are being played out at an educational level. And we were part of that and we grew up through part of that. And how could we expect that somehow we could have control over those aspects of it, and that somehow we would have a benevolent –

By the way, I am very pro-public education, though. This is not at all to say public education is wrong. I was *state*-educated all the way through to. – I don't know if my last degree was, but certainly in grade school and secondary school, and in my first years of university I went to *state* universities. I believe strongly in *state* education, but it's not perfect. And so, how could you develop safeguards against what are already flawed systems? And how could you trust a system not to have these endemic levels of various isms? Biases.

/ Although it's interesting, because I would say that certainly these days or in the British education system, I totally agree with you about state education. Actually, the imbibing of those isms comes mostly from peer-to-peer interaction and child to parent. And actually, the institutions that education should be working against those prejudices, they're actually...

□ It's certainly not the case in rural Alaska. I can assure you.

/ I'm very sure that's true. And it wasn't particularly the case for my education... Speaking to my friends who have kids who are at school now, and I mean, the liberal agenda is very much tied to them, which obviously I agree with but...

* What example, when it comes to practical consequences, and Volker you were asking, or you said I'm too open to wake. Practical example. We've got some technology which in the UK is legitimate. I mean, to have a child with three biological parents. The only legal option is when mothers or potential mothers have a mitochondrial disease. That's the only time when they can use that technology, whereby you simply have one egg cell and take another egg. You remove the nucleus from both cells and enter nucleus from the one into the other and then you fertilise it. And that works really well.

And now, we can imagine either a lesbian couple, or two women and a man who said, "No, we love each other. We want to stay together. We've got a technology which works and only our Christian heritage doesn't allow us to use that technology. We want to use that technology and have biologically related offspring. We love each other. We are nearly like a traditional couple, a traditional family because there are three parents and a biologically related offspring. We want to get married." Why should the state forbid such an arrangement to be legalised?

□ It shouldn't.

/ It shouldn't.

* They shouldn't. Exactly. That's what I'm saying.

○ Such legal restrictions will likely go away even more as they have done over the last quarter of a century, at least in many countries. Who would have imagined that gay couples can nowadays marry? That notion would have been almost unthinkable back then.

* In Columbia, there was already the possibility of three men getting married, as one example.

○ And in terms of the variety of marriage arrangements, in many societies one can marry multiple partners. Polyandry, as a woman, you can marry several men, and polygyny, where a man can marry several women. We may find that rather unpalatable in our Western societies, where polygamy became forbidden once the state became more efficient, because one feared the development of powerful clans. If you have big genetic clusters of families, they will constitute a threat to the state, which is why you want to split your society into manageable little bits, monogamous families, nuclear families, they can be easier to control and manipulate. That's why when the state of Utah wanted to join the United States, the Mormon community had to officially denounce their polygynous marriage system. This socially imposed monogamy is a political tool so you don't get all these forces within society who pursue their own interests and would rather castrate the state.

* I would have thought in the Western-

□ One of the theories, anyway.

* I would have thought instead of in the Western tradition, it was part of the Christian natural law of understanding according to which the genitals have one purpose, and if this purpose is not used, as the purpose is reproduction, then it's an abuse. It's unnatural.

○ But it has nothing to do with-

* The only natural use is for one man having sex with one woman for reproductive purposes.

○ No, that wasn't the case, for example, Charlemagne, one of the godfathers of Christianity, had many women. That was accepted. So that depends-

* After Thomas Aquinas with the natural law instead of culturally, later established that...

○ But I think we are veering off a little bit... Let's go back to our actual topic of...

/ On that topic, I think I've got something to say.

□ ... Cultural evolution is going to happen.

/ I think there's a reason that what you suggested about the mitochondrial DNA and the three parents seems there isn't an instinctive reaction against it, because it's still allowing the randomness of nature to happen. And I think as soon as one starts engineering what they want one's offspring is, that people have a not-so-justified reaction against it. So, that's why I do believe that what you're suggesting is going to happen, because it's hard to see a reason not to. It doesn't feel like playing God in the way that people would say other sorts of genetic engineering are. Sorry, I've interrupted you there.

○ No, no. I think that's a very good point. But again, we are at difficult crossroads and I don't think it will ever end. If you are a lawmaker and they tell you about what prenatal diagnostics, you then weigh the arguments pro and con, have endless debates and ultimately arrive at some law. By that time, there are already fifteen new developments about which you haven't even thought about.

There will be this steamroller of constantly new gene-technology developments. And society will be constantly surprised and challenged to even understand what's going on. We are living in times which are very confusing for that reason, confronted with conundrums which were never there.

In the not so far future, the German state may still be concerned about the question if people should be allowed to have a sixth finger, because that's better for smartphones, while in Azerdudistan, the law sanctions to make children with four legs, because they can run faster in the Olympics. I think, this stuff will happen.

□ Maybe what we need is... Maybe I'm suggesting a form of social engineering, but somehow writing into this a proviso for reflection and for critical thought to be applied too, because what it feels to me, is what you're describing seems quite likely. In fact, I think these scenarios also, I agree with that Stefan has mentioned, but there...

Because everything is happening so quickly, I think what is lacking is reflection time. Reflection to think about consequences, reflection to think about who is driving perhaps the biases against double-times-double-times three-parent children. What would be the arguments behind that? Is that due to homophobia? Is that due to sexism? Is it due to playing God? And try to have, I'm not saying to entertain the biases, but at least have discussions around it, which is what is lacking.

/ I think some of the...

□ ... the critical thought of the enlightenment values is no longer being allowed to play out.

/ I totally agree. But I think sometimes the problem is that these things come about as unintended consequences of other technologies. And I've been thinking, because one area of the traditional science fiction trans-humanism is cybernetics. We haven't really talked about that, but, but if we look at where, you know, limit placement is these days, it's astonishing how far we've come and it's getting to the point where prosthetics are better than natural limbs and then... But then what happens if an army decides that those are the soldiers I want.

○ Of course they want that.

/ Yeah. But so, but we've already got the technology because we haven't had...

□ Oscar Pistorius qualified for the regular Olympics, not just the Paralympics.

/ Exactly. Exactly. Yeah. And so we don't reflect on the initial technology because it's a clear good. And then by the time we've got it and it has all these other uses, it's almost too late because it's just going to get used that way.

□ Okay. So how could we build in any type of - well, I guess we can't. Maybe that's pie in the sky thinking too, but it seems to me that is what is lacking. Just even a moment to breathe and reflect.

○ But then you are naive, because the argument is typically, "If we are banning this, then other nations will do it, and we lose the business opportunity."

□ No, I'm not saying banning it. I'm saying considering.

○ While you're considering, you're wasting time, because there will be all these...

□ Maybe not because there's deleterious effects from going with this. Maybe I'm actually making the more prudent choice and being able to observe.

○ You could say that, but I believe that...

□ I do say that.

○ Well, you say that, but that of course is not going to happen, because the selfishness of moneymaking will lead to that new procedure being cultivated in some other place...

□ Okay, yeah, too more risky behaviour where people aren't-

○ The mighty nation of Swaziland might suddenly promote all kinds of new technologies, because they want to be the Silicon Valley of Africa.

* Another option is what the people are already doing. If something's forbidden in all countries, in the nation-states, they go to sea-steading to try new things out...

○ That's what I mean.

/ Yeah, absolutely.

* ... Where they have no legal boundaries.

□ I think if they're not doing it – the talk I was at, it was implied that very soon, if not actually in the present – there will be portions of human brains in pigs very soon.

* Yeah, for sure. The best example of sort of human animal hybrids is a wonderful example because it started off in the UK. They were allowed to create them and to develop 14 days. Then in the US we've had a human-animal hybrid, human pig hybrids developing 28 days and now Japan has actually legalised for them to get born.

Why? The reason for that actually was they wanted to replace, I think it was lungs, sort of the genes related to... into the pigs and to have sort of the possibilities for xenotransplantation. I mean if it worked... if we kill pigs for eating, for consumption, then we are where it's legitimate to kill them for xenotransplantation as well.

○ That brings up a whole topic we haven't touched upon, the topic of personhood, whether only humans have personhood. At one point we wondered if the machines can have consciousness and would they then be people? Would they have to have rights? And a pig who has, let's say, a human brain, is that still a pig? And should animals be allowed to be killed because we find that useful for us? And so on. That is a big debate, connected to all of that.

* Exactly. And this is sort of one example. Because often many critics of trans-humanism claim "Well, this is a type of hyper-humanism now, isn't it still the same kind of development which we're humans? It's only but enhancement of humans." And so on. That's what most transhumanists at least share. They claim personhood for nonhuman animals. In contrast, now we hold a different understanding from which we'd have to move away from, namely that that we humans are the only ones possessing a divine spark. We are the only ones who should have who deserve personhood. No, we need to expand that. We need to move away from that understanding and take into consideration morally relevant capacities, in particular the capacity of suffering and, and that has...

/ It's gaining ground, that view. I heard someone in England is pushing to have the feelings of sort of dogs considered in divorce proceedings, which doesn't seem unreasonable to me.

Yeah. But it's interesting that's coming from trans-humanism because one often thinks of... as someone not involved in the movement that it actually would be the opposite. But that's quite heartening that that's...

* I mean the big conferences on their topic. They invited Peter Singer also as... And yeah, that is generally shared, but that's a logical consequence also of sort of that revised self understanding of human beings. We are no longer the ones you know, just created by God, but we are part of the result of evolutionary processes, and we do have special capacities but not the special capacities related, you know... immaterial ones.

But so do other animals have special capacities? There are vampire bats in South America who can live on the basis of blood only, that's also a special capacity. So that's not a justification, you know, for us being the only ones who should deserve personhood.

□ I do find it interesting. And this wouldn't necessarily be trans-humanist, but I do find a lot of this discourse interesting amongst secular humanists, which privilege the human above so many other animals and assume... they're not using the word divine spark, but they might as well be when they talk about the extreme human exceptionalism. This does have a little bit of discourse in trans-humanist stuff as well. But I, yeah, like Bex, I'm pleased that it is – also from what I've read recently as well – that there seems more discussion of ourselves as another animal who is special and like other special animals. But to me the divine spark, even if it's not called divine spark is problematic because it implies soul. Personally, I'm technically not an atheist myself but I'm a materialist who believes in arguing in materialist forms and I find it troubling that people would use like, "humanity" and "essence of humanity" in a scientific argument.

I find that deeply problematic and it seems a lot of trans-humanists have this idea of transcendence of something immutable that you cannot touch, you cannot describe, you can't... this is a soul that is being described.

★ How strong is that part of old culture, still as a relic of our Christian tradition and we find it... I mean there are hardly any exceptions on a constitutional level. In most constitutions all over the world, it's only human beings who receive legal personhood. In Germany, for example, it's claimed, "Well, animals are no things, but legally they're supposed to be treated like things." And wherever that shows up, this is still sort of the traditional separation as humans have having been created by gods. And the others as being merely natural beings. And, luckily there are many movements, all over the world, where this gets altered. For example, there was, in Argentina, now I think it was an orangutan who received legal personhood and, as a consequence, had to be freed from the zoo.

And this is why there's a strong, such a strong reaction to transhumanism because – and then related movements – because it's sort of a break away from our 2000 year old Western traditions, all these foundations with our human exceptionalism are being altered. And that has paradigm-shifting consequences in all aspects of our life.

○ Let me go back to that question of essentialism, I think that's at the heart of that self-perceived exceptionalism. What Kathleen also mentioned, the concept of an immutable kernel inside us, an essence, which is sort of the platonic embodiment of an idea. Like, there is a rosehood and a humanhood and a pighood, and these categories are real, instead of being conventions. Transhumanism interestingly has that corrosive acid in it to eat away on that concept of an essence. And evolutionary theory as well, because how can it be that there was a mother mammal who didn't have a soul, which is the essence of being a human, who gave birth to a child that had a soul?

□ Jane Goodall believes chimpanzees have souls.

○ Jane Goodall is a good person but not a good philosopher. Anyway, once we have these type specimens of humans, you and me and you, we look at each other and we say, "Yeah, these persons clearly must have an inner kernel which makes him or her a human." Evolutionary theory questioned that. And when we now move into the cybernetic, cyborg world, this will corrode that illusion of an essence of a human even more.

/ Well, I mean, my understanding of current physics theory is that it's not a widely accepted but a legitimate theory within it. That consciousness is a fundamental property of matter and that there might be a fragment of conscious that even an atom has which points. Yeah, it's...

○ I think for that, we would need a physicist. That sounds like having read two pages in this magazine, what was it, what you read? *The Scientific...*

□ My *Cosmopolitan* – my *New Scientist*.

○ The *New Scientist*.

/ But I think the reason to return to the idea of corroding boundaries, I think that's why people have problems sometimes with, with trans-human things are that it falls into the uncanny valley when we're sort of, when we're exactly between the categories that we've accepted for so long. And things aren't quite as we expect them to be. Because I think people do have quite often, there's quite a visceral reaction against trans-human things. I mean you must have encountered it Stefan in your, in your work.

* Yeah, very much though. I mean these sort of the traditional dualities get twisted. We've had that very simple understanding there, where we've got an immaterial soul, a rational one, so rationality, that led also to a sort of sexism, racism of course. You know, rationality is the male quality and the body is connected with the female, the material is obviously of a lower value because only the reason comes from God. And now, once we move away from that understanding, all these traditional categories need to be rethought and that has sort of... It was easy. We have the male and the female in natural law being responsible for reproduction and now we... so if we disentangle sexuality from reproduction, and that's one of the major direction connected with emerging of technologies. I mean it started with, well, obviously, the condoms but now it's the pill and it moves away with now having the possibility of children with three biological parents. We've got in vitro fertilisation, we've got a pluralisation of possibilities of reproduction.

□ But it could, you could also argue in humans at least because of the fact that females are sexually receptive throughout their entire cycle, that has been going on for a long time for human females because we are... We can have sex all the way through. We don't just have sex when we're in heat or on heat as the British say. Or actually it's not the technical term for human; I'm using an "animal" term. But because of that and because also when women breastfeed, which is a natural prophylactic as well, so we are actually, we have "naturally" – with air quote marks – been practicing kind of forms of prophylactics probably fairly early on.

I don't know whether other great apes... Well yeah, they do. They also, when they breastfeed they do not ovulate regularly so it's also a prophylactic there, too. So in a sense, the females – anyway – of the species have been able to kind of to separate reproduction from sexuality, particularly with human females who continue to have sex throughout their entire cycle. As I understand some chimpanzees even continue to have sex non-reproductively throughout their cycles as well.

/ I think it's a specifically Christian idea that sex and reproduction must be linked. You, you won't find it in most other religions. I mean...

□ Certainly Catholic, I was brought up a Catholic, so...

/ Like in, in Judaism one of the ways you can sanctify the Sabbath is by having a good shag. And the idea of sex for pleasure obviously is all throughout classical cultures. So yeah, I think it's almost returning to an earlier form of conceptualisation of that kind of thing rather than a breaking ground on an entirely new one that's happening right now.

○ Very clearly in nonhuman animals, most sex is not leading to reproduction. Sex is the ultimate social tool to manipulate others, to make them believe certain things so that they forget about their self-interest. Sex as a weapon or as a sweetener.

□ As a tool.

○ As a tool.

* And as a consequence also we moving away from that binary understanding of gender, of sexuality, pluralisation of... We've got, I mean we are not interested... It's, it's tradition, certain heterosexuality as if every male man was interested in any kind of women to reduce everything just to the aspect of our reproductive organs. It's just such a limited way of talking about sexuality. It's rather, it's usually a sort of a relationship of affects. We are interested in how someone else talks about things, whether someone can lift an eyebrow, what someone is interested in. This is what drives sexuality, erotic relationships now.

/ I'm not sure that's the case with sexual orientation. I think that can be quite focused on the sort of binary just because it obviously is quite concerned with genitals. But I think it varies person to person and we certainly we are under the understanding that there's a wider variety of ways of being attracted.

○ For me again, that is the interesting horizon of transhumanism, all these concepts in the liberal Western world that promote diversity, whether it is transsexuality or homosexuality or bisexuality, orgy-like behaviours or non-reproductive sex, and that all of that is found in non-human animals, too. That fluidity is a part of natural evolution, because evolution per se produces diversity.

□ Behaviourally also.

○ Behaviourally and genetically. That is a big change from how biology was perceived in the 1950s, 1960s.

□ But that's problematic though because there is also, there's a conflation between sex and gender that is current... and also between sexual orientation and gendered behaviour, which actually is also something we often accept but has not actually potentially been "proved"... As someone who studied, like yourself, quite a lot about sexual orientation, it's interesting how often all the papers like to bring sex, biological sex into sexual orientation and assume that homosexuality is an "inverse" state; assume that this results in predictable gendered behaviour, eg, gay men being more feminine, lesbians as *ersatz* males, when what recent studies *actually* show is that gay men's faces physically are more masculine than the average straight male's face, or that lesbian sexual behaviour is more like that of straight women. A lot of the results also show that we conflate sexual orientation and gendered behaviour together because we psychologically essentialise not only biological sex but also that we essentialise subsequently attached culturally manifested gendered behaviour *associated* with biological sex, to such a great degree.

We may be imposing our views about culturally manifested gendered behaviours tied in part to biological sex onto sex stereotypes and also onto sexual orientation itself, which I think is quite interesting. So that means we have a lot of, from some of the research we did, it seems like we essentialise male/female sex behaviour the most out of anything from humans to machines to animals to sexual-orientation stereotypes: it's maleness/femaleness that we essentialise most. Volker and I worked on a paper together where the results suggest this. This was a separate part of my PhD thesis. But then because we *then* impose our assumptions and biases about gendered behaviour bias onto sexual orientation, I think this is possibly problematic, as what we understand as sexual orientations in essence a sex drive and "romantic drive" about secondary sexual characteristics. So I digress but I mean to say that I also don't believe in concrete sexual orientations. So I am in agreement with you. I don't believe in "a heterosexual" or "a bisexual" or "a homosexual". I think things are much... But that's about sexual orientation. But then people immediately also want to then throw in biological sex, which I think personally are different discussions, but biological sex and sexual orientation and even the concept of gender have been conflated culturally.

○ A lot of these words are convenient for us and necessary to make sense of the world. They are inventions of our need to communicate.

□ Yes.

○ But, that sounds strange from a biologist point of view, for me there is no sex and gender unless I talk about it. So that is not...

□ That's a solipsistic view of...

○ I'm not sure. We want to make sense of what is around us. And so we start to categorise the world.

/ But there is a material reality which we're reflecting in our language. I mean we are...

○ Which?

/ Well the fact that we, you know, as a sexually dimorphic species rely on sexual reproduction, involving two sexes to reproduce ourselves. That's a reality. That's not just an effect of language.

□ And that's in mammals rather than, say, in reptiles, some species of which have biological sex classification that is mutable with temperature as well. So people take a little bit of science these days and then use it to kind of... without applying critical thought sometimes to the processes of what, for example, Bex is talking about right now. The material reality is that humans are – as a mammal species – are canalised into two separate sexes.

I believe in wide-ranging gender. I absolutely do. And I believe it's gender that shackles us. But it's okay to say I think – and I don't think it's particularly problematic – to just acknowledge the material reality of two biological sexes in mammals. Now theoretically that could well be transformed in the future and under trans-humanism may well be. And maybe really interesting, exciting stuff, too, if we were able at some point, be able to do stuff at a very chromosomal level.

/ Yeah, I'd love to experience life embodied as a male. I think that would be amazing.

○ You would perhaps then conceptualise yourself as being smack in the middle of some normal distribution of creatures. There are all kind of fuzzy edges in biology, perhaps we then use the word intersex or something like that...

□ But biologically, intersex humans are still canalised into male or female and that's why we don't have – well, the technical biological term, which is not the human term – that is why we don't have so-called “true hermaphrodites” amongst mammals is because humans can't self-fertilise in that way or have two functioning sets of reproductive organs. You can sometimes – if you're intersex, of which there are multiple human varieties – have offspring via one set but you cannot have both functioning sets of reproductive organs as a female and a male. Chimeric absorbed human twins aside, which is only theoretical.

* But do you think there was some animal who can, no?

□ There are multiple animals who can. But they are not mammals, and my point is that. So there is a certain – I think that's why I do have to say I found transhumanism exciting for that reason.

/ Yeah.

□ If one is able to transcend what maybe I also would, could say is the shackling influence the biology, that is quite interesting to me.

/ And that would break the shackles of gender as well. If one were able to change one's involvement.

○ But where do you want to stop? You can say you are a mammal, or a vertebrate, or a generic type called an animal. You have a wide distribution of possibilities...

□ However, I am a mammal, which means that I canalise into one or two at the moment.

○ And you believe there is such a thing as a mammal?

□ I believe there are organisms that nurse their young, there's going to be small bumpy bits.

They're going to be some of those mammals that are going to be exceptions, tiny exceptions which do not follow the rules of what we've classified as a mammal or a reptile or a fish.

I am a person, as you know this anyway, who believes in similarist thinking, so I would prefer to think of us all as one – this is why I said I wasn't an atheist earlier – as one connected panentheistic whole, a holism that includes all of organisms together. And I would prefer to look for patterns that link us rather than separate us. So no, I would be happy not thinking of myself as a mammal. I am also a person who believes in material reality, but my brain, and this is where the trans-humanist swig of my brain is open to thinking of myself as part of a fish, part of this crazy little spaceship in the cosmos. I'm part, you know, I'm carbon... Yeah. A little bit of gold from a star. I'm connected to it. Or like I would like to think of myself that way.

/ The categories are artificial and imposed, but the criteria on which we define the categories are in there, they're inherent in the organism.

○ I would dispute that. We simply cannot get out of that circle. In order to talk, we need categories, and as soon as we do, we believe they must be real. In that sense I'm actually more of a social anthropologist or a crazy postmodernist, like, it's all a discourse somehow.

/ I can't bear post-modernism.

○ I am since long in an anthropology department, as a hardcore biological anthropologist, together with social anthropologists, who perceive much of our world as relativistic. I have taken that on board as an enriching perspective.

/ Yeah.

* Language really is an issue or is a problem. It's not a solution we can solve easily because our language, which is established, has metaphysical connotations. So basically, a specific understanding of the world is implicit in the language we're using, and we have to use it because it's established. So it's difficult also to get out of this frame of mind, which we've shared for a long time. Maybe with technology... when we talk about technology in humans, there's something, you know, technology is a means. And sometimes technology is a means and can be meaningfully analysed in this way. Otherwise, technology is altering who we are. And this is also the case and we seem to be forced to making a distinction between the two. But now both is true, and that's a challenge of the language which we've inherited, no?

/ I think we could only obviously see the world, understand the world through the prism of out of our language. But what I believe is underneath our feeble understanding is an actual reality, which we fumbled towards. Not that all reality is constructed discursively. I don't, I don't accept that.

○ That is a deep philosophical quagmire. Is there reality? Okay, unless I'm drunk, I shouldn't be allowed to talk like that.

/ I think the reason I rebel so strongly against that kind of view is that it seems to be an abdication of moral responsibility and moral decision.

○ Okay.

/ Which I think it's crucial at a time like this when we are having so many fundamental...

○ There we could find together. I might not ascribe to underlying realities, but I also experience myself as a social being together with others. And I want to make sure that you're not cutting my throat because you don't like my argument.

/ Promise you that much.

○ But from where do I take my moral guidance? Because it would be easier to slit a throat and I can have it my way. There have been many times in human history when that was how it was done.

/ Yeah.

○ How do we arrive at sort of value, which will last for a while? And that brings me back to the problem, with developments being so fast, we will constantly play catch up... Whereas when developments weren't that fast, maybe for 500 years you could have some sort of rather rigid societal structure.

/ Yeah.

○ I don't want to sound as if I'm a conservative but I really don't know how I will do it, because I am constantly asked new questions. But who am I to judge stuff on the latest genetics or technological developments? And who should?

/ And our moral understanding is evolving. I mean look... the personhood of animals is a particular example of that, which would have been an absurdity 50 years ago, 40 years ago. I can't.

○ Yeah, except that in other cultural contexts this concept was already floating about.

/ Yeah, yeah. So I don't know. I don't have an answer.

□ I mean it's falling back a bit to material reality, but I... people are evolved to be generally cooperative. I figure chances are quite good if I go down in a bunker with people that generally, I don't remember statistically exactly but...

I figure I have about at least an 80, no 90% chance of them being decent people who won't slit my throat, to bring it back to that. And therefore, I mean it's a little bit of a wager cause I mean, you might not know everyone, but it's a pretty good one. I mean chances are good that I'll walk out of here.

/ Chance's good none of us are a sociopath.

□ We assume that. Some of us could be very, very good at hiding that.

○ Not wanting to be cynical, but remember that 75 years ago, our throats may indeed have been slit in this bunker. We had that great privilege in our generation of growing up in these often-vilified Western societies, that we experienced a time when we were allowed to pretty much say what we want, without being imprisoned or killed.

/ I think I'm all constantly aware of that as a gay Jewish woman, it's hard not to be consciously aware how incredibly lucky I am to be alive now.

○ We are lucky that we were born at a certain time and can have some sort of educated discussion. That's not because we are particularly smart people. I just happened to be born into a good state school system like Germany...

□ And Alaska had the money rolling in in the 70s, which meant I got a good education because of the oil money, in all honesty.

○ So, we are lucky data points.

* I want to stress actually many things which are already possible. We are not allowed to do it. I mean, obviously we live in wonderful times in comparison to this historical path.

○ Let the oppressed man speak.

* Incest example. Incest is illegal in Germany among consenting adults. There is no good reason for it. If there is, I mean, if they're competent adults being involved, I think it's for example, that's one example. We have the possibility of selecting a fertilised egg after in vitro fertilisation and pre-implantation genetic diagnosis. There was a case in Germany, and the reason they try to... While they reformulated, it used to be forbidden, then it was, it went to court and there was a need to make a new decision and then they regulated it well. We all want... we need to prevent handicapped from being stigmatised. And that's very important. That's a very important aim. And then they came to a new regulation which basically said, "Okay, selecting fertilised egg after in vitro fertilisation and pre implantation genetic diagnosis is illegal, but you are allowed to do it, if there's a high risk genetically in the parents of the child being mentally handicapped." And I'm saying, this reinforces the stigmatisation of the people with a handicap.

A much better counter solution would be no parents in the same way as parents have the right to choose a partner for reproductive purposes, they should have the right to select a fertilised egg after IVF and PGD because it's the same kind of selection procedure. In both cases you did have some predetermination, but no one is fully predetermined because of the epigenetic processes. And so I think these again, two parallel processes, which should be treated analogously or also in a moral sense.

/ It's fascinating because for example, in many societies colorism is very strong. If you could select to have the palest of the potential offspring, you would end up with a lot of societies whitening themselves. And I don't think we'd want that, but it's-

○ If I would constantly live in Germany, yes, I surely don't want to be surrounded by people looking pale like me.

/ I believe in Asian societies where that's the case as well, where parents who could would choose to have the palest skinned baby they could, and I don't think we'd want that. But then how would you not allow that and allow the other? I mean I don't know where you draw the line.

□ In the U.S. you definitely can choose the sex; it's legal to choose the sex of the baby.

/ Is it?

* But only for family balancing reasons. So if you've got six girls and say we want a boy now, then that is a legitimate option. But then also the possibility, for example, of saviour siblings.

/ Yes. That's quite weird.

□ That's an interesting one.

* That's an interesting case now.

/ Yeah. As a writer, I'd spend a lot of time thinking about what it would be like to be that sibling.

□ And you're an only child.

/ And I'm an only child.

□ Yeah. I got loads of siblings. But recently my mother had some bone graft. In fact, we're waiting to see whether it takes, because she broke a limb and then wasn't healing. So then she had bone from her femur put in, and then I was thinking, Ooh, what's the next step?

You start to think what's the next step after that is first-degree relative. Obviously I would, I'll say it on tape. I'd be happy to give my bone marrow for my mother because I am 50% related to my mother. But I'd do it because she's a lovely person, but it suddenly became a very stepped out of theory for me and something quite personal that that hopefully will not be the case in three or four months.

But I also, it's not – for me who is not an only child, there are three others who also could do that too. And she's got three living siblings also, so it's not quite as – it's interesting to me just as a person who's from a huge family. And when one is an only child you don't have as many options; you have to actually be more pseudo-altruistic in that case.

/ But there's a difference between-

□ Kin selection.

/ "I now exist and it turns out I can be useful to a relative." Or "I was created to be useful to this relative." Stefan, what's your feeling on saviour siblings?

* It is a tricky case, actually. But in the end and I'm not a utilitarian thinker, but here I'm actually, my reflection would be quite utilitarian. In the sense that in the end the risks associated to a kidney transplantation are not so big. You can live very well with just one kidney and, in the end, you have, well, you've got two healthy children instead of one.

□ I'm sure that child will be very... I guess I'm with Stefan. Actually, I think the child would be very loved. The second child also. So it's caused me some thoughts about this over the years, but I don't think it's necessarily ethically wrong.

/ I don't know what I think. I'm very torn about it.

□ Then it just makes me think about kin generational, kin selection and reading some stuff about transhumanism of cryogenics where people say, well wake up, you know in 400 years and my kin will take care of me. And it made me think also about diluted kin selection. I've thought about this for a while. But once you get past generation three or four and you're going to 12.5% of your genetic relatedness to generation four and then getting diluted after that under, some arguments in an evolutionary theory, you would be less *related* to someone from 400 years ago.

And I actually think this may be a problem with how humans conceive of the future anyway. We're concerned potentially about our grandchildren who would be 25% related to us. But as it gets more diluted it becomes more abstract. And that might be, that may or may not be something from our brains that doesn't allow us to consider it's not natural there with air quotes to conceive that many generations into the future. But we somehow we need to in order to save our planet at the moment we're going to have to trick ourselves into thinking of them as closely related kin.

* We are people who normally stress the differences but in the end, it was Apes. I don't know, depending on the calculation, 98% identical genes, and with other animals, it's always a high percentage there. It's much more which connects us to the others than what separates us.

□ Yeah, that's what I mean. A similarist mode. But we'd have to shift to that mode.

○ Exactly.

□ Do you have any ideas how to do that?

* Advertisement. That's the way we talk about it, now we talk about it, we enter into public discussions, participate in advance. We write literature in order to stress it. That's how things, it's not one person who can change it, you know?

/ And we do have a fantastic capacity for empathy. I mean, the fact that we care about nonhuman animals is already extraordinary. I think the fact that I care so much for my cats is absurd. But also I think hopeful because it suggests that we can trigger those things to care about future generations. We care about the world.

○ I'm skeptical about that. You care about your cat as long as you have enough food to share. If a crisis would come about, then our deep selfish existence will immediately come to the fore.

/ I wouldn't do that to my cat.

○ You wouldn't let your cat starve? Maybe not. Okay. Yes, I can perceive that many humans would still feed their pet and starve themselves. But to state that all these other human beings are closely related, and that humanity is one, I think that is a thin veneer. It would quickly breakdown in conflicts over resources, and we will hunker down in our little villages and bunkers, and hope that we are the lucky ones. So, I don't believe in our good nature.

* Yes.

/ You may be right.

* However, just to see, according to the general developments, it's not so bad all over the place, I mean in comparison to 200 years ago. 200 years ago we've had an absolute poverty in Europe of 80% people. Children had to work in coal mines at the age of seven. The average life expectancy was 40 years. In the past 200 years, with technological scientific innovations, we've had the average life expectancy of 80 years. We've got an absolute poverty rate on a global level of 10%. There are many good aspects associated with these new technologies. That's why I'm trying to make the people aware that, I'm not arguing with your formal description, but by means of technologies, we can find a lot of goods.

○ The problem is that resources are finite. The last 200 years have enabled us, because of technologies, to extract more and more resources from the planet, which made humans multiply and live healthier and longer lives. But that is an unsustainable situation. We are approaching an end game because what nine billion people need and want will inevitably mean that these resources will very quickly not be available anymore. We had these 200 years of being lucky. Humans will not be so lucky in the coming 150 years.

★ I'm not a futurologist.

○ Okay.

★ I can't predict the future, I mean that's why I find it hard making such predictions.

○ Yeah. Okay.

★ I think they're very good technological innovations which are quite promising. Like in vitro meat. It's a way, we don't have to kill the animals, we don't have to have the mass farming, antibiotics need to be given to them. They again cause antibiotic resistant cells. That has the consequences for climate change, CO2 emissions, and now in the future then we'll have some nice Petri dishes at home and we have a wonderful piece of in vitro filet steak without antibiotics, without animals having to be killed, which would be more probably more sustainable on a global basis as well. Because the richer people get in China, in India, the more meat they want to consume and if they consume the in vitro meat, that would be fine. I mean, so there are a lot of interesting technological innovations which could make things much more sustainable than use.

○ Until now we didn't have to think about sustainability because there was so much out there, fish and wood and ore, we could just harvest and happily consume. Now there is need to think a bit more into the future. Maybe technological advances will allow for more sustainable energy production. But I work since 40 years in the tropics, and I have never seen anything getting better in terms of nature being conserved. I only see a destruction of biodiversity and environmental degradation, the silting of rivers, people falling back into poverty, et cetera. So that is my-

★ The Rhine's cleaner.

○ The Rhine is in Germany. However, the River Taraba in Nigeria, which had a lot of water until recently, increasingly runs dry because the hills around have been denuded from trees, because the wood is used for gun rifle butts in China. So, I'm very pessimistic. And I'm very happy that I will not see too much of this demise anymore, because I will be dead soon, statistically in 32 years.

□ Or maybe not.

○ I will die when I'm 92 or 93, something like that.

/ That's the plan?

○ Oh no, hang on a second. I've always upped that projection. I'm already 65, so I will live till 97, and then hopefully not know about anything that's going on, but become happily dead, just like-

□ So you would prefer to be uninformed.

○ I want to become an uninformed dead post-human... We have talked for almost two hours. Can I throw in some of the keywords we had, and maybe then we say, yeah, that's all I wanted to say. So, we had the upgrading, we had the Superwomen, Superman, we had the un-embodied consciousness; there was the idea of opting in, opting out, given the new developments, xenotransplantation, cybernetics, colourism and other discriminatory concepts; whether or not we can perceive ourselves as being related to those who are actually others; whether there's a dystopia in the future. These topics we touched upon. Is there anything close to our heart what we still like to say? Like silicon-based transhumanism and carbon-based transhumanism. Where do we feel our curiosity hasn't been satisfied?

/ I mean I am quite interested in the futurologist questions of where we are going to be with these things, what are the options that are going to be available to us in 10 or 20 years' time. And I probably not well enough informed to know it. If it's something you could answer Stefan or well you just don't think it's possible to know?

* I don't like to make predictions. I'm like the 30, 50 years prediction based even on empirical stuff. I find it really... I don't think it's pseudo-scientific to go for.

○ Yeah, it will be pseudo-scientific. What about the question?

/ But then I'm a fiction writer?

* All right. If you're a fiction writer that's perfect. That's your job.

/ I suppose, sorry. No, no carry on.

* What I liked doing? Nope. I'd like to being confronted with the fictions and to give inspiration for contemporary challenges. That's actually... There's someone who's collecting loads of science fiction stories and recently he entered all of them into the database and now there're companies approaching him, they want to invent a new, I don't know, dry cleaner. It's something. And so then they pay him to enter that term into the database and to get inspiration for future inventions.

/ That's wonderful.

* And yeah, I think it is. It is a wonderful way to it, for fiction and innovation to interact and also besides, I mean science fiction... art in general. I find highly fascinating the interaction to show new possibilities, bio art, Eduardo Kac who's done Alba, the fluorescent rabbit.

Well, actually the first time I was here at the Art Biennale, it was, I don't know exactly, it was maybe 15 years ago and I saw Patricia Piccinini and there was a sculpture I saw her sculpture "still live with stem cells", the little girl moulding humans out of stem cells. It was a sculpture and that really changed my-

□ Was it beautiful?

* That was actually quite beautiful. She also created *Graham*, I'm not sure whether *Grahman*, based on what would someone, an entity have to look like? Who would survive? Who would have the highest chance of surviving a car crash? And that was a sculpture based on scientific research.

/ Wow.

* That didn't look beautiful.

□ That's true.

* There was a friend of mine who genetically engineered Zebra fishes and managed to realise that in order to get some of the nutrition, 15 to 20% based on photosynthesis and that worked.

/ Wow.

* And so as a consequence, the Zebra fishes turn slightly green. So the little green human beings from outer space they might actually be our future.

□ Zebra fish, I think, have numeracy. So there's a lot of wonders about even non-mammals that are-

* I mean, genetically we're not so different from them, so if it works with them and it's a matter of further training, we could employ that on human beings. And that's better than starving, turning green, it's definitely a better option now or we might need that on Mars missions in the future.

□ Yeah. It's more direct, I suppose there's that.

* Exactly.

□ Yeah.

/ At this point what interests me one of the current projects I'm working on is I'm scripting for the Amazon Prime TV show, which will be on sometime next year or the year after called *The Power*. Which is about... It's based on a feminist sci-fi novel in which women, by Naomi Alderman, in which women spontaneously across the world, start developing the power to electrocute people. They basically develop an organ like the one inside electric eels and the point of this, as she wrote it, was to create, to change the power balance and just physical, more physical power between men and women and then imagine what would happen to society on that basis. And I think that's what's fascinating about all these things. You could make one little change and then I think the social changes that will flow from it could be huge and I think unpredictable but fascinating.

□ Can I throw in a primatological version of that? Well then, I have been taught by Volker, so I'm sure it's Volker's example in the first place just to give him due credit, but you could also argue with the bonobos who are so... Then they can obviously interbreed with common chimpanzees, et cetera. But the bonobos, which have a matriarchal structure or someone would say co-dominant structure, the females have quite a lot of power through coalitions and because they organise together against males who try to be patriarchal. Which actually doesn't happen with the more patriarchal chimpanzees, but they think that one of the reasons to do with this is, which is under something called behavioural ecology, is because of the division of the Congo River. Volker, please feel free to correct me for the whole world if I get this wrong.

The bonobos had more access, or were more able to exploit a particular abundant food stuff which is more leaf-based called terrestrial herbaceous vegetation, which means therefore the females were not in high competition with each other like chimpanzees are with fruits. Therefore, were able to be more cooperative together and form what is a more egalitarian if not more female-dominated society, but chimpanzees and bonobos are I think one million to 1.5 million years separated, not very long and yet have extraordinarily different social systems.

And there has been some interbreeding between them. They found that through recent genetics, but it's mainly social-system differences, but that's how a tiny little tweak, a tiny little tweak has this huge result in this case like organisms and actually evolution, not just culture, but actually adaptations also.

/ We just do it. We still need to focus on why it's troubling that we're not having the time to consider what's happening, because if each little thing could have a butterfly effect and there's a million little things and who knows. I mean I don't blame you for not wanting to make predictions, because who knows where everything's going to go.

* No, it's interesting but, as a philosopher, I don't want to make predictions. That's simply not, I find that fascinating. I don't think actually it can be made on a scientific basis. It's just too much.

○ I agree, there is that issue of direction. How do we know? Okay, maybe retrospectively, but looking into the future? Still, it goes back to whether we should try to implement directional change or just leave it to humans subjecting their brains to whatever happens happens? Or should we want to have certain developments taking place, they're better than others? Or leave it companies who make the most profit or should we regulate?

/ I think one of the issues with trying to impose a direction is that we understand ourselves very poorly. I think a lot about mobile phones, which are effectively *Star Trek* communicators. We have produced them, but we're not using them to do what they could. We're using them to text each other. People stop phoning because no one wants to, no one predicted that. We imagine we'd have this wonderful thing and we'd be video conferencing all the time, but actually that's not what we use the technology for. So I think it's hard to force us in one direction because we react in ways we don't anticipate.

○ There we have the nuclear problem. I mean, when Lise Meitner and Otto Hahn split the atom, they did that because it was a fantastic thing to do. But, what came from it? Good stuff, bad stuff, atomic weapons, nuclear power plants, medical applications. So, I also believe it's not possible to predict what's going to happen and regulate that already. And we'll always probably have more cons than pros. I'm skeptical that things will not get out of hand, there will be big unwanted consequences. But how to do something about it, don't ask me.

* And in any case we do have criteria and at the moment for what we prefer, and these are all contingent nodal points, but they are meaningful to us and so if it, for example, that's quite much discussed a risky experiment in China concerning the scientists who tried to do genetic modification, crispr, genome editing do you know anything? To vaccinate against HIV. I mean in the end if that worked out, if this doesn't have any side effects, I guess most people would want that. I mean that's somethings which-

□ Yeah, I was quite excited about the new – again, I read it in *New Scientist* magazine – the new pill that they have actually not just stops a genetic ageing, I think it was in mice, but they think it's certainly applicable to humans but actually *reverses* it recently. Some combination of DHEA and metformin, I think, to stop the cancer implications, but that was very interesting to me. I think most people would be, “why not?” I mean, in multiple arenas I think some aspects of transhumanism are extremely exciting and wonderful, possibly speculative, but stuff to do with gender, stuff to do with a lot of these extensions of self are hugely exciting.

* That's actually another aspect of these human animal hybrids we talked about earlier, it's not just about xenotransplantation, but actually I mean we now have an average, we think there's a maximum lifespan so far it was 122 years, the French lady, and so far that seems to be the limits of a human lifespan. But that doesn't mean it has to be, remain like this.

I mean the turtle Harriet died the age of 178 or something. There're many other animals, they live a couple of hundred years. So if we found out by means of data, big data analysis, which genes are responsible for their lifespans, and we could take them and integrate them into the human genome-

□ I could see that happening.

* That would be something we would be interested in.

/ I mean obviously on an individual level-

* What is individual level exactly?

/ What's the problem of the commons? I can't remember. The fact that it individually would be great, but as a society. Exactly. Yeah.

○ You're back to eugenics, in terms of you should not be allowed to live longer than 120 years. What kind of eugenics would that be? You are, that is a non-

□ *Logan's Run.*

○ So yeah. I don't know.

/ And it is to do with unequal distribution as well as the-

○ Yes, unequal distribution. Why should I be allowed to have my 120 years? Whereas the person in Suriname who doesn't have the resources will be subjected to just 56 years.

□ We already have that type of disproportion at the moment anyway.

* Yes. However, even on that global level now in the poorest countries in the world, Nigeria, they've got an average life expectancy which is higher than our life, the life of 50 years. I mean it's still lower than ours, but it's higher than the life expectancy we in Europe had 200 years ago. So all the access to HIV drugs and it used to be, I think only 10 years ago was 10%, now it's up to 45, 50%. On a global scale of HIV positive, people have access to the drugs. So, I mean it's not a perfect situation, but it's better that people have access to the drug, the drug has gotten developed in the first place.

□ Yeah. I am in total agreement to that, because I think sometimes currently geopolitically that the argument officially is like no one should have access to many things. Well, I actually think it's better to have *someone* having access than no one -

* Exactly.

/ Economies of scale mean eventually it will become accessible to them.

* And we need to make sure to expand that to be more inclusive, more and more people. I mean this is our effort to do that. It's not a necessary development, that the prices will go down or the people will have access. But that's our political engagement. We need to take care of that.

○ One question, which we haven't explained to ourselves and to the three people who listen is, why we got actually interested in transhumanism? So, what was it? What sparked our particular interest in that keyword?

For me, if I look back, I grew up in a village in Germany, and was always interested in animals. From that came my career as an animal behaviour researcher and particularly monkeys and apes. I then started to see these very obvious similarities between us and other primates and became drawn into debates about animal rights and non-human personhood. And had to think about more philosophical issues like human exceptionalism. And also about boundaries, like, in terms of sexuality of classifying people. That was my career, which was run more by the evolutionary side of theories. I'm not really somebody who had to think much about classic transhumanism ideas, looking into the future or so. That is my own little story about becoming a transhumanist. I don't know if somebody else wants to chip in there?

/ I think for me it was through fiction. But that's the interesting question because it just made me realise, I first became interested in fantasy fiction and through that sci-fi as well through reading a book called the God Beneath the Sea, which was a novelisation of some of the Greek myths and actually the Greek gods and heroes are transhuman. And I think that at the center of most of the narratives of the kinds of books I read, the heroes, the classic hero's journey, the hero in that journey is a transhuman. They are greater than other human. They are enhanced in some way.

○ Ah, yeah.

/ And I think, yeah, that's how it started. And then obviously as I got older I read the actual cyberpunk and related novels, which are more explicit studies of that kind of thing. But I've always, obviously as a writer, one writes about often, well as a genre writer, the exceptional. And so the transhuman is sort of at the core of the kind of stuff I-

○ How did they get enhanced, these heroes?

/ Usually through heritage from the gods. They're demigods, the Greek heroes. So yeah.

□ Hybrid.

/ Hybrids. Yeah.

* Even the gods in Wagner's *Ring of the Nibelungs* are in a way posthumans because they are not eternally strong and forceful, but they are dependent on the golden apples.

/ Yeah.

* That's part of the story.

/ Yeah.

* So once Freia's golden apples are being taken away by Fasolt and Fafner, the gods age.

/ I think Norse mythology is particularly fascinating because it ends in apocalypse. Because they fall, their life span is not unlimited.

□ And then restart.

/ Yeah.

○ Maybe, sorry, I was the one who transgressed.

/ I will, okay.

○ Okay. So, we had myself, then we had Bex-

/ Okay.

○ And now Kathleen. So what got you interested in transhumanism?

□ I was forbidden essentially – not entirely, but mostly – forbidden television as a child. We only had two channels anyway in rural Alaska. My parents were very kind of anti-TV and so it had a very forbidden quality to me. And I think by the time I was 16 or 17 my siblings and I had an agreement where we would secretly watch *Star Trek* by retrieving the pliers and turning on the channel-dial that my parents had hidden. So we all cooperated to watch forbidden television together. But due to that, my parents really encouraged reading books and I had no censorship at all in terms of reading books. And I was talking about this publicly recently; anyway, therefore I was allowed to imagine anything, anywhere. And I think because I was in my early teens in the mid-80s I was reading a lot of like dystopic, environmental science, juvenile or young adult fiction, which is what I would have been most influenced by.

I think that when you are forced to imagine things just in your head, it's a different process than when you're shown them visually, and for me I think it helped me in my own processes, as an artist and a filmmaker in terms of symbolic thought, and also as a writer because I think I might have been conceiving things in a different way that I would have if I had just been more passively taking it in.

The end result is I eventually did Master's in Film Theory because it was both the forbidden quality and also because I just loved it and I had been forbidden it, and it was wonderful to study film in that way. The internet was very new in 1998 for the general populace and I did my Master's on something I was later to explore in my PhD studies, which was in part on the categorisation of extensions of ourselves.

And so for my Master's, I actually looked at this human, I think I call it the human/machine dichotomy in my Master's dissertation. And that to me was, I was very interested cause it fit in with all the narratives of my teenage years, like the prosthetics that were in those young adult novels, the idea of extending oneself. And I was extremely optimistic about this all when I was 27. Also, I was just really excited about the potentials. I thought racism would cease because of the internet. Sexism would fade away because we will be able to empathize with each other. And I'm a bit more cynical about that now. I feel optimistic about some parts of it too, but I think I was naive in the way I thought about it.

So eventually I did my doctorate on how we binarise different concepts, and I looked at male-female divisions, heterosexual-homosexual divisions, human-animal divisions, and then human-machine divisions. So I continued and I hopefully will continue my thoughts about how we binarise and then going back to what I initially said at the beginning, and this is just a personal philosophy, how we can envelop a holism around these rather than this split, for to me that is quite important philosophically.

* Yeah, the split is fundamental for me too. I mean sort of these binaries, and I mean I came to philosophy, age 12, Heraclitus was the first-

○ Hmm?

* Heraclitus.

○ Oh, Heraclitus. Sorry, sorry. Yeah of course. Heraclitus.

* From Heraclitus there was all the sort of his aphorisms, well the remains of his writing, they were commented on by Nietzsche and Plato. And so I started reading Nietzsche and Plato, and Nietzsche sort of became my educator. I'd read all of what Nietzsche wrote by the age of 20 and he presents a way of thinking, this naturalist way of thinking, non-binary understanding, there's a permanent becoming in everything. And this is when I tried to employ, think through the consequences and I realized actually the dominant philosophical traditions, they still uphold sort of that human exceptionalism, dualistic thinking. And I was confronted with a lot of challenges that are consequences of that because these power structures are still very strong. What, who are pulled? No, we are the rational, only rational creatures and then I went into applied ethical issues by being confronted within all of these debates because of the inventions of new technologies.

And then the end of the 90s there was like the Sloterdijk-Habermas debate in Germany, Habermas and Sloterdijk, probably the most famous German living philosophers and Sloterdijk, in a presentation which was entitled *Rules on The Human Zoo*, said we need to think about the impact of genetic technologies. That's all he said. In the end, he played around with Nietzsche and Heidegger and it sort of had the connotation of "What do you want," if he thought we need political, while he was suggesting some really dangerous thoughts and Habermas replied to that, and actually by the way Sloterdijk did not suggest any Transhumanist ideas in the end. Actually it is so bio-conservative, it is more bio-conservative than Habermas. But Habermas then replied to Sloterdijk he said, "No this is like Neo Nietzschean breeding fantasies," that's what he wrote in one paragraph in his book on liberal eugenics.

And he cited Sloterdijk without mentioning the name of Sloterdijk. Just not to give him too much public attention, but this was sort of the context when he connected questions, applied ethical questions with Transhumanism and with Nietzsche's thinking. And so that's how I started to combine these elements and I thought, "No, I need to develop the proper philosophy of Transhumanism, which takes all the various aspects and developments into consideration" because most of the Transhumanists who are the public speakers, intellectuals as they have sort of a background of being AI people, of entrepreneurs, innovators, not specialist and not properly trained philosophers. And that's what I'm basically trying to, that's what I've been developing.

/ Yeah. It would seem to me that Germany is the right place to be having a lot of these conversations because, because Germany is going to be cautious with any concept of the Übermensch, and that a lot of the Silicon Valley people are very, yeah. You know what I'm saying.

* Yeah.

O Okay, because I'm the oldest, I can at times reign us in. So, now I would like to ask a question - which possibilities of transhumanism would we ever want to still live and experience? Stuff that might happen in the future where we would be curious to be part of somehow. Can we think about that? You mentioned something already.

/ I can certainly say which fictional universe I would want to live in, which is Iain Banks' *The Culture*, which is the most utopian vision.

O How does that work?

/ It's actually not a human society, but it's human-like people in our galaxy, they've developed AI to the point that they have sentient minds, who are so much more clever than humanity that they actually, they run these worlds, they're at the technological level where they're living in Dyson spheres and similar habitats and humanity, crypto humanity, has been engineered to have drug glands, which are an internal system where they choose to inject sort of engineered drugs which will make you happy or sad or a bit melancholy as you listen to or watch a sad play, or allow you to sort of control your own emotions to some extent, would enhance your own experiences.

But humanity itself has been, and healthy lifespan has been extended, and people can download their consciousness if they choose. But in this society, people don't choose to live forever. Usually they have 300-400 year lifespans. And because everything is controlled by the machines, it's a life of complete leisure for humanity there. And that's quite the appeal I think. And I think elements of it like the longer healthy lifespan are feasible in the nearish future. And I'd certainly be interested in that. And also as a speculative fiction reader and writer, the idea of meeting a nonhuman intelligence is endlessly fascinating and appealing. And whether that's a machine intelligence or an alien intelligence or even just a modified human whose intelligence has become so different through the modification, that's something I'd love to do. So that's, that's me.

○ Yes.

□ Okay. So if I were to take another...take another speculative fiction kind of model. I do have quite Luddite tendencies, in some senses. And so probably I would choose kind of like *Woman on the Edge of Time*. That was Marge Piercy who wrote it, who kind of envisioned a cooperative eco-village where everyone's bisexual; they're doing the work roles based on what your abilities are. They have solved the problem of the tragedy of the commons but I don't remember how. But there's constant communication. It's very idealised. It's pretty hippyish. It's slightly, except for the everyone being bisexual, it's slightly how I was raised. This is it, my parents were kind of Back to The Landers.

That said, there are some aspects – so I have a tendency towards that, and I always appreciate the organic – but that said, there are certain elements of Transhumanism I find extremely exciting. And one of them is, is possibly the extension of life. I think I'd like to live maybe a couple hundred years more. I love being alive and I've lost some people to death over the years and I think life is so precious and I don't think – well, I rarely get bored. I think I would enjoy that. I think eventually I would like to die, but I'd like to be in good health for like 300, 400 years. Eventually I probably would like to die, but I think I would really, really enjoy that. So for me it would be, I would fall into the category of people who, I think there's some benefits we can get from this and I think there are some dangers and I think I would be excited about extension of life possibilities.

* Yeah. This is something, I agree with both of you, so the health span, expanded health span is something which is, I'm very interested in on a very individual level, but also for the others. And that seems to be a realistic option given the various technologies we discussed. Yeah. I don't take seriously people, who are Transhumanist and who mention and affirm immortality, and mean it in the literal sense. I don't think this is a plausible concept, it's absolutely ridiculous, it cannot even be conceptualised. Sort of once the entire universe either comes to a standstill, the expansion, or comes to cosmological heat death, and then we are dead. I'm sorry. Give up the notion of immortality.

□ Absolutely, yeah.

* But a radical expansion of a health span, yeah, that's a wonderful direction, a great goal which we ought to promote further. Then definitely plurality w needs to get promoted further, too, we also need less paternalism in society. That's soccurring, when the institutions tell you what you have to do. That's something a direction, which I think needs to be promoted much further. We've already achieved quite a bit, but there is still potential for more. And the third I think important achievement or direction, which I would love to experience is sort of to have technologies for a sustainable future. To take care of the challenges concerning climate change and so on. And I think there is a lot of potential in that and because it's not just something which gets up to technology, it cannot only be applied to us as humans but also, you know, to change the circumstances, the conditions we live in. And it's always an interaction between our capacities and the environment which promote the human flourishing. And I think that's a fundamental aspect to reflect upon and consider.

/ I think I would be interested to see what a post scarcity human society could look like.

□ You guys can both come live with me in my eco-village in 400 years when we're all still alive, except for Volker who wants to die at 92.

○ Yes, 97.

□ We can reanimate your corpse.

○ 97. I mean, it's interesting, the extended lifespan. I discussed with friends recently and how long would we like to live. These were guys my age, sixties, seventies and academics, and so we really regret that with our curiosity, which we have maintained, we haven't even started to study all this stuff, which we want to. I have never read Nietzsche, because A- I find it un-digestible, but B- because I didn't have the time, I had to read other things. I think we settled for 218 years as for how long we want to live, because after that all things will repeat themselves. We didn't think about enhanced humans, so that after 200 years or so we would then go in circles – "Nietzsche again? No, no, no. I read that when I was 97, so come on, let's not read that again."

But on a more practical level, a little bit dirty old man kind of thing, if I could still live to experience great cybersex, I would find that great. You know, no problems with consensuality, everything. And I could change my sex and change my gender and have orgasmic feelings, and they would merge with music and art and so. I would love to experience that, but maybe a bit of LSD will have that effect anyway.

Yeah, we have done well, it is two hours and 26 minutes. However, maybe one last thing, because we are here at the Biennale. So, our artsy stuff, which we nowadays produce, how does it relate to transhumanism? Can there be a particular kind of transhumanist art production?

□ There is in the sense that, I mean as someone who is a painter who has now moved to about 50% digital work, there's definitely a difference in how you conceive – it's the ephemeral nature of something being digital. And I've had to relate differently to material, even in terms of doing an exhibition recently where I had to think about, I know how to print or even have the originals in terms of a 3D art piece, but how do I relate to my work, which is only digital, it's an *idea* which I have modified, I mean we do it with music now also in different ways. I mean, we've been doing it a long time with music, since sound recordings, but also in theory since written notation of music and being able to replicate it.

So for me, that's interesting, like this idea of the ephemeral, again symbolic experience of art, which can't be preserved, or can be preserved also in different ways to having a painting. For me there's a difference and there's a similarity between doing a digital work and doing a painting and sometimes I'm mixing up the two a lot.

/ For me, the interesting thing is, if we could expand human senses, then what would painting look like? If we broadened the spectrum of.

□ If we could have like synesthesia-type experiences –

/ Yeah.

□ That would, I mean I took that, I took that battery test. Apparently I have a teeny, teeny tendency towards some synesthesia according to the test I took, which is probably nonsense. But I find that quite interesting, I mean that would be something maybe something similar to what Volker just said, like an extended of being smelled, tasted. I mean in a sense though, it would still be me potentially who is the creator or perhaps an artificial entity imposing what we think it would be, and then it would be that old argument of who owns the art. Is it my experience of it or is it what the intention of the artist is? I always kind of go – I default to art being about a person's personal experience and not-

/ Yeah, I am very death of the author about it.

□ And not artistic intent. I think it's, it's subjective, but that's a philosophical viewpoint.

* Yeah. I mean there is actually a great diversity of art already, which is sort of classified in the wide wide field of Transhumanist art or-

/ Really?

* related to Transhumanist. I'd actually, yeah, I've been organising conferences for 11 years of bringing together Transhumanism and Critical Posthumanism, and then two of them have already been dedicated to art aesthetics and these movements, and one finds that on the level of composition, music composition – Sven Helbig for example is an amazing contemporary composer who uses technology – new instruments and new way of performing in order to represent non-duality are central elements.

But I can only hint at that with the sort of, another one is a Spanish artist, he has the metabody project where other artists like Stelarc are involved in as well. He has wonderful a pan-gender cyborg metaformance and a metabody project. He does not do performances but metaformances. A performance implies still the dualistic distinction between performer and audience. But in the metaformance there is no such distinction anymore. One walks through the audience, which is no longer the audience, but there is sort of the interrelationship between audience and performer. So this dualistic boundaries also get dissolved in that manner, which I think is very important, once we move away over the traditional binaries and that has consequences again for all these levels of protection. Even if we do have to give a presentation, it's sort of the speaker and the audience that amplifies the binary thinking. There is a categorial distinction between them: The speaker in the front, and the audience separated from the speaker in the background. So we have the binaries on so many different levels.

Interesting is also what is being done in the field of using deep learning in order to create new music. I mean, there was a project that was done by Sony music, but they involve basically all the Beatles songs in order to create a new Beatles song based on the ones which are available. It's called *Daddy's Car* and you can hear the traces of the early Beatles, the later Beatles. It's not a bad song. It wouldn't have been a world hit but it's interesting what is already possible and that shows the potential that can be developed in the future. But it raises a lot of art aesthetic questions.

□ It's actually raising a question for me, which is when they do a lot of the evolutionary psychology arguments about average faces as being most attractive; it's actually not the case that the average faces are the most attractive. It's that they average the face and they come up with an average face but what people are often more attracted to is distinctiveness and in features, whether it's a nose or eyes and lips or whatever rather than the amalgamation of prototypes. So then how could you, I mean that would be interesting artistically because maybe *Daddy's Car* is the average of it where it's actually what would make a – I'm not so into the Beatles, but I recognise that they are, I'm sure they're geniuses in their own right – what would make a genius Beatles song would be something which is distinct?

/ Well it is an average or is it a machine learning, trying to sort of figure out the tricks. Although-

□ That's true. Maybe it's distinctive. I haven't heard it.

* Well, what is also interesting are these programmers in Japan who created the plot line of a short story, but they created an algorithm which was responsible for every single word and that adds to the short story competition and it was shortlisted.

/ That's pretty terrifying for someone like me.

* That was interesting. I haven't read it. I mean not being able to read Japanese so I can't really comment on the qualities, but it anonymously entered that competition. It was shortlisted and that's quite striking.

/ It really is, yeah. The other thing that suddenly occurred to me is I think there is a Transhuman art form already in that there is an area I work in, which is games, where you do absolutely construct the narrative yourself in conjunction with the parameters have been set up for you and as it's increasing moving into virtual reality and augmented reality and areas that are quite deeply concerned with it. So yeah, I think I would say that is the post-human art form that currently exists.

□ And what does that, what does that type of the dream art they have where they're able to take the images or suggestions of images that they'd be able to pick up from cognitive signals in the brain, and then there's the fellow or woman who is then enhancing until they get a recognisable object. Probably not what the original dreamer dreamt; I cannot remember the name of the artist. And then they end up at these incredibly beautiful kind of landscapes usually, but because they're using machine learning, they often have objects or suddenly a unicorn pops up or something's strange or a boat or some maybe something mundane. But it's quite-

/ Yeah.

□ Sorry, whoever you are, you're probably not one of the three listening, so that's okay, this world-famous artist who does these enhanced and not just, they do it in process. So over time it starts to look like something. It's like if you're staring at clouds and then suddenly it becomes that thing. That is beautiful, I think. Do you know who that is?

* And I just know that, by realizing brain-computer interfaces, it's possible to re-structure some images from the brain-

/ Yeah.

* of what people look at. And recently a sort of an engineer from Bremen found out and was able to demonstrate that mind reading was possible, but it's a brain-computer interface that was taken on by Facebook. Facebook now has an Institute with 60 employees in order to realise mind readings. So the future of typing will be thinking our thoughts are no longer free, so the future of use of Facebook, you'd sleep and all of your sleep or dreams get uploaded. You know that has enormous implications, but he's spending a lot of money on that project.

/ But also positive implications for paraplegics for example.

* But yes. Yeah, that's why it's not getting boring.

□ Possibly even art.

* Well art as well, yeah.

/ Wow.

□ Wow also.

/ Yeah.

○ Yes.

/ What about your, the artworks you have in mind?

○ I have no artsy side, but I'm fascinated by interacting with artists. For me, art which gets me is art where I don't know why it fascinates me. It somehow transcends me and takes me to a place where I don't know where I am and I've never been there. If the art is too decipherable for me or I can see why I like it, then it's not very exciting. What I like, just as a stupid example, is, let's say, something like Mark Rothko and a canvas with one big colour on it. Transcendent transhumane or something like that. I don't know...

/ Yeah, I agree.

○ I could get us to agree that our feet are cold in this bunker, and that we have a human, not a transhuman, right to have warm feet. And that for that reason we come to the end of our conversation.

/ I think we may have reached a natural conclusion.

□ A singularity.

○ Here I found some sugar, they gave us very bad tea down in this bunker.

/ Oh, gosh.

○ Okay. They gave us very good tea down in this bunker and even sugar. But how can you be more cheesy with these little sugar sachets, with the logo of the Biennale printed on them? Which is a very good closing line. Because we don't know whether our transhuman future will be this or that, well, we know it will have pros and cons. Will it be a beautiful future? Will be a dangerous future? Clearly it will be an interesting future. And therefore I pronounce: "May you live in interesting times."

□ Thank you.

/ Thank you all. It's been fascinating for me, if not for our three listeners!