

# [Transcript] Laurens Landeweerd - "You never know when Science Fiction becomes Science Fact."

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**Katherine:** [00:00:10] Hi, welcome to the neuroethics police. I am Katherine Bassil and with me today is Laurens Landeweerd. We have an interesting and thought provoking show for you today. We are going to be talking about human enhancement, including for instance questions like, "why do humans want to combat aging and live forever?". We will also be discussing a [00:30:00] hot topic heavily circulating the media channels nowadays, and we are going to finish off with some neuroethics news.

voiceover 0:49

*Everything you do or learn will be imprinted on this disc.....part man part machine [00:01:00] ....may have its origins in science fiction, but the human enhancement is already a part of us.*

*In the machines that enable us to hear better, keep our hearts pumping, and move our bodies when we no longer can. The possibilities for human enhancement are endless. Where do we draw the line? [00:01:30] When does a human become a robot? And what does it mean for the future of humanity?*

*To some degree, we are already...a cyborg. The result may be the end of humanity...with the microchip imbedded in his brain, Ian Burkhart became the first quadriplegic to move his hand through the power of thought. A moment described a science fiction come true, [00:02:00] as his brain use the computer to communicate with his muscles. And with it came the beginning of a new bionic era. But what would happen if this technology was to become mainstream outside the medical world?*

*Transhumanism is the belief that the human race can evolve beyond its physical and mental limitations through technology. [00:02:30] The idea has existed for decades. But as the science accelerates the parameters of the human condition to be changed forever, and the idea is becoming more popular.*

*To some degree, we are already a cyborg. You think of like the digital tools that you have your phone and your computer, the applications that you have. Over time I think we will probably see a closer merger of [00:03:00] biological intelligence and digital intelligent.*

*...billionaire Elon Musk is backing a company trying to create a direct link between our brain and our technology. But will such advances lead to tech based inequality... we see this merger of the biological sciences with computer science. The result or ever, may not be the upgrading of humans into Gods, the result may be [00:03:30] end of humanity. It's a distinct possibility in the 21st century, most humans will therefore find themselves in a new category in a new class.*

*...But what would a cyborg future look like? If a new group of super humans emerged-who would control them? In the wrong hands, cyborg technology could be exploited by [00:04:00] unscrupulous corporations and governments, others man and machine Come closer. Perhaps the biggest question for humanity will be who controls who?*

**Katherine:** [00:04:30] Laurens, thanks for joining us today. I have been thinking a bit about the future of our species. What choices are we going to make today and where is this going to drive us towards- paradise or Babylon? But before you share your insight on the matter, tell us how did your interest in the philosophy of neurosciences, including topics such as cognitive enhancement and lifespan extension come to exist?

**Laurens:** [00:04:54] Oh, that's good. Thank you. Quite a long time, I suppose. And when I was still Studying, [00:05:00] I studied at two universities that one was Maastricht University

and the other one was the University of Amsterdam. And in Maastricht I focused on, well, oddly enough, the philosophy of art. Whilst at Amsterdam I focused on epistemology and metaphysics.

And the link between the studies was made or forced by, by the topic of my graduation, my master's thesis or at the time it was called a [00:05:30]doctoral thesis, which focused on a well by now almost disappeared tradition. In specifically Dutch psychology, called phenomenological psychology. And the reason why I opted for that was because phenomenological psychology, in contrast with many other approaches in psychology, did not embrace the idea that you had a strict separation between the knowing subject and to the object on the study.

[00:06:02] And of course, this is an artificial division because the object on the study is of a similar category as the knowing subject in psychology and psychiatry, but also in the neurosciences. Now afterwards, I wound up studying specifically metals of genetics, but also later on matters of the overflow between philosophy, ethics and the life sciences. And in this respect, I'm end up in a project called Neri, [00:06:30]which focused on responsible research and innovation in the neurosciences. So while this project was about science, I think that this was about five or six years ago.

So my focus on the ethics of neuro sciences was extended from a study of psychology to a study of the neurosciences and occurrence, it revolves mostly around my study of the works of the French philosopher (on the dead zone) was one of the first [00:07:00] to criticize the viewpoints of brain reductionism of the idea that you could reduce what an English is referred to as the human mind, to the brain surgeon and say the philosophical questions that arise in this confrontation between the scientific method on the one hand and type of reductionism that is, that it carries along in terms of [00:07:30] studying the scientific mind that my interests lie.

**Katherine** [00:07:35] I think it's so funny that you mentioned that because I think in every episode with every guest that we've interviewed for the past year, everyone mentions neuro centrism. So neuro reductionism again and again and again. So I really think this is such a central topic nowadays,

**Laurens** [00:07:50] But it's a red line in the in the philosophy of the neurosciences, I would say, and it directly relates to a quite old question and philosophy itself, which is The question of dualism that was called into life or not called into life but but let's say most articulate in the philosophy of René Descartes probably was mentioned in earlier podcasts as well.

**Katherine** [00:08:15] Very interesting. So, all of the topics of neuroethics, right there are millions, which one has been your favorite one or the one that you believe requires our greatest attention?

**Laurens** [00:08:28] I suppose, if you look at the ethical dimension of this, this issue of dualism than it is the topic of how to safeguard a notion of human agency human rationality and human autonomy within a scope of a science that for mostly methodological reasons, ops for a reductionist approach.

And of course, reductionism is a very functional and useful methods within the sciences to study certain phenomena. But if one takes such [00:09:00] reductionism as true at face value, then this carries along certain ethical tension areas. In addition, this area that I'm mostly interested.

**Katherine** [00:09:11] Can you give us an example maybe?

**Laurens** [00:09:13] Um, well, if we study for example, the notion of free will, free will is of course, a phenomenon or phenomenon. It's something that we did that we take as a point of departure in philosophy because without free will we cannot really attribute any notions of responsibility or guilt. [00:09:30]

So, the moral dimension more or less disappears, if you reduce away free will. Let's show this this is an issue which which of course also emerges often in in neuroscientific discussions of possible neurological causes of crime and criminal behavior, which is a minefield of course, if you if you can study it from a scientific point of view, a moral minefield, I mean. But it is it is, well, tension areas such as the study, you studied my point best in practice, I would say. [00:10:00]

**Katherine** [00:10:01] But let's move on to what we are here to talk about today. I believe we need to set the stage before starting our conversation. If our audience wanted to know, of all the arguments being currently used when discussing lifespan extension or living longer, but also human and cognitive enhancement, which ones are science fiction? And what should people not worry about?

**Laurens** [00:10:28] Well, which ones are science fiction doesn't really bother science fiction, but you never know when science fiction becomes science fair. So in this regard, we should always be cautious in calling out something as science fiction. But still, I would say that you're own assumptions over the possibility of mind uploading, for example, are not only too far fetched, it's not only the case that we actually we're too early in some kind of technological developments to actually predict when this will be possible. I think that it is impossible by necessity due to the distinction [00:11:00] between organics and mechanics. So that that's one, there are of course, possibilities for lifespan extension that already exist which include also focusing on healthier nutrition also focuses on genetics. But the there are at this moment, philosophers, ethicists, some scientists as well who claim that they will achieve an age or large span of about 150 to 200 years or even longer. [00:11:30] I will not expect that this will happen...

**Katherine** [00:11:33] At least anytime soon?

**Laurens**[00:11:34] Not any time soon.

**Katherine** [00:11:38 ] We ran a poll yesterday on our Instagram page, asking our followers whether they would take a drug that would make them live longer, more like live forever, and I was surprised by the responses we received. It was distributed. 50% wanted to live longer and 50% wanted to age natural. From a philosophical point of view, [00:12:00] why are we as humans investing a lot of time and a lot of money in living forever?

**Laurens** [00:12:07] Um, well, I suppose it has always been one of the desires of mankind to to be equal to the gods. And the gods of course live eternally, at least in most mythologies. We do not seem to be easily able to make peace with the fact that we are finite beings. And this [00:12:30] has been a core theme or core topic from the beginning of at least Western philosophy, I will say that this also counts for Indian Buddhist philosophy, for example. So we do not easily make peace with the idea that we will die at the age of around 80, maybe 90 or so, because then everything ends and we might not have fulfilled everything that we wanted to do.

So I suppose that it's a very basic desire of mankind to live as long as possible. [00:13:00] It also relates to very biological function and the drive to survive. And remember, but 50-50 is indeed an interesting division, because I suppose you also expected more people to want to live longer.

**Katherine** [00:13:14] Yes and no. I mean, I mean, if you asked me, I would now say no, I don't want no longer, at least I don't want to live forever. What's the point of living forever? Right? What what are you going to do, you know, after hundred years. So those questions also surface about what is what [00:13:30] is the point?

**Laurens** [00:13:31] That's indeed one of the core issues. So mostly if people discuss issues of lifespan extension, then the arguments that are brought into the arena to say what we shouldn't do this are usually rather circumstantial. So one of them is often Well, I will survive and all the people that I hold dear will die, but that depends whether or not that depends on the extent to which other people are also using such therapies to extend their lifespan.

So that is not necessarily [00:14:00] the case in terms of lifespan extension. And other arguments revolves around the problematic fact that the last years of our lives are spending in infirmity. So if you live forever, whilst you have the physical age of 103, sitting in a wheelchair, and most people would not want to embrace that option either. And but suppose that we would be able to create well a drug or a therapy that will make you retain the age of 40 [00:14:30] for that for ever, doesn't that change things?

Well, of course it does to an extent. And then there's, there's there's this this core notion, which is the problem of meaning. So what's, what purpose or what sense does it have if life just continues forever, you can do everything and it doesn't really have an impact on the long run anyway. So this is also alluded to, in a play that was written by Simone de Beauvoir, French philosopher and this play was called *Tous les hommes sont mortels*, [00:15:00] or all men are are humans all humans are mortal. And it revolves around an actress in the 1930s, who meets with a count and this count more or less by accidents, attained a formula which gave him eternal life, not some of the longevity, but eternal life and he's been around for about 700 years or so. And to him, everything is a continuous repetition of the same thing. [00:15:30] So he doesn't really see why his life should have any purpose whilst the striving of that actress is to well to at least have our image be eternal. Because famous famous, of course, something which only lasts very briefl, often 20 or 30 years or so, hardly anybody will remember you as an actress. These are the actors impressing the show, so fame is a very momentary thing and she wants to live forever to embrace a more eternal sense of that.

[00:16:00] And it's a tension between these two that that elucidates the point of this meaninglessness of eternal life. There's there are similar examples of that there's there's a series of novels by Robert Heinlein about an immortal man, who, once every few centuries also bumps into the question, why am I still here? Why should I still want to live and continue living? So and then there is, of course, also in Greek philosophy, [00:16:30] the famous scene that describes the death of Socrates in which he appeals to the people that are sitting around himself, stating that life would not be very sensible anymore if you would not be able to embrace that, since the very finitude of life that creates meaning, and it's on this specific point that Martin Heidegger, German philosopher focuses metaphysics, the idea that we cannot create any meaning if we do not [00:17:00] embrace some type of awareness of our finite nature.

Now this is an issue that has also been treated with a something that that is relative to because even if we were able to take drugs that make us live for a very long time, there will probably always be the option of suicide. So if it becomes meaningless, and then then we can also always step out of it again.

**Katherine**: [00:17:25] Maybe then suicide would also be embraced and not looked upon as a negative thing.

**Laurens** [00:17:30] You could say that if you the more options for lifespan extension come into existence, the more tolerant society might need to becomes towards ending one's life.

**Katherine** [00:17:34] That's a very good point. Many scientists view aging as a disease as something that needs to be fought to be cured and eradicated. Do you agree?

**Laurens** [00:17:53] No, I don't but this depends very much on the definition of disease. I would say that if you look at [00:18:00] Mankind as part of evolution, then death, the death of individuals is a necessary precondition for organisms to evolve. If all organisms of a species would live forever, then apart from problems with overpopulation, that would not be an evolution of the species anymore. So I would consider death as a necessary precondition for our evolution in itself as well.

**Katherine** [00:18:27] But many also say that aging actually contradicts [00:18:30]evolution because why would a species try to constantly try to survive when aging is a natural process?

**Laurens** [00:18:34] A lot of species in itself wants to survive Of course, but it doesn't go on unchangeably either. And so for for change to occur, some things need to disappear as well. I'm sure in this result, the individuals within a species are well, you could consider [00:19:00] the species in itself as a barter, aggregation level of an organism that shows the individuals make up such a species.

And in this regard, the species in its ever evolving and ever changing nature needs individuals to die off as well. And at the same time as a species evolves, earlir states of that species have died out as well.

**Katherine** [00:19:23] Should we want to live forever?

**Laurens** [00:19:24] I don't think so. No.

**Katherine**[00:19:26] Why not?

**Laurens** [00:19:28] Because it goes against this notion of change, [00:19:30] living forever carries along that that that you are against, change or evolution. And while you might say that suppose that you would would live forever then at a certain stage in 30,000 years or so, you would not be the same person as the person that you are now.

So in the sense you die anyway, you you might not be able to remember everything that you were 30,000 years ago. So in a sense, this this this notion of living forever, is an illusion already. [00:20:00]

**Katherine** [00:20:08] Now here's the interesting part. We ran another poll on whether they would take a drug that would enhance their cognitive capacities such as intelligence, IQ, focus, and the majority was in favor. Now cognitive enhancers are more likely to occur in the coming decades, if not sooner, unlike lifespan extension. [00:20:30] Are we ready for that?

**Laurens** [00:20:32] I don't think so, actually, because there are already certain cognitive enhancers on the market... and modafinil, although the specific enhancement effects of these drugs is also drawn into question. Whether they really work that well or the slightly. But if we then look at how academia has transformed in the past two decades will show this was completely alien to the academic world about [00:21:00]30 years ago.

But if we look at academic life now then I see a lot of students taking Ritalin merely to get through an examination period or nearly to achieve what they need to achieve so, so this this desire to take cognitive enhancers has as much to do with the preface of society, as it might have to do with the individual goals of self realization a certain person wants to achieve.

**Katherine** [00:21:27] Many argue that this will lead to inequalities that in the first phase only [00:21:31] those that can afford such drugs would be able to make use of it and hence benefit from enhanced cognitive functions, whereas those from a lower socio economic background would suffer the consequences. What is your take on this?

**Laurens** [00:21:45] Well, I would agree that this is an issue. It's the people that either have the funding to take such drugs or the technological access to such drugs that will benefit from it. But there is also an issue between [00:22:00] downunder as I mentioned in my response to your earlier question, the the issue of the imbalance between the individual and the collective because it's, it's with cognitive enhancers, it is the individual that is adjusted to fit in with the demands that the collective particulates. And we should, we should be very careful with that, because we then consider society and its demands, as it exists now, [00:22:30] as a given wealthy individual is considered as something designable or malleable and to my mind, the morality of a society should be the society itself should be adjusted to be able to embrace as many individuals as possible. So it's a matter of social inclusion.

**Katherine** [00:22:50] But don't you think especially when we're talking about cognitive enhancement, we face an even bigger inequality and even bigger unfairness?

**Laurens** [00:23:00] In terms of the people who have access to that or not? Well, it increases the unfairness that's there. But of course, you could you could also approach this from a circumstantial point of view and then state, well we make these drugs available for everybody. So they are available freely for anybody who wants to take them. So this is also an aspect of social organization of access so that you get a fair distribution. But then at the same time, they're still the problem of people feeling socially coerced [00:23:30] to take these drugs whilst they might not want to. So apart from the economic aspect of this question, which is resolvable, there's also an aspect of individual autonomy at play here.

**Katherine** [00:23:21] And social pressure here. I think

**Laurens** [00:23:44] Yes, it is an issue with not only that go that fellow students are taking this, but this also might have consequences for the way in which examinations are organized. So so the system adjusts to the fact that only people take these drugs all and then other [00:24:00] people are not taking them need to adjust themselves again to that system.

**Katherine** [00:24:02] That's a good point. Can you envision a future where we are all capable of philosophical thinking, maybe those drugs that are going to enhance our cognitive capacities, I mean would create probably a better world right, over a tool of Aristotle's the cards, and...

**Laurens** [00:24:23] I don't know whether these individuals have taken drugs to be able to achieve the well [00:24:30] state of mind that might be a precondition for philosophical reflection. I don't think that's necessary precondition, actually, because, in a sense, one of

the focus points of philosophy is to achieve enlightenment. And enlightenment doesn't come in a bottle. It needs to be something that you achieve through going through a certain trajectory. So there's there's no elephant paths towards enlightenment.

**Katherine** [00:25:03] All of these technologies we've mentioned will lead to an overall human enhancement. But even the enhancement of a species, things that needed millions of years to occur due to evolution and natural selection, we will now be manipulating. And by doing so, maybe even changing the course of our species destiny and even identity. Have you heard of CRISPR or clustered regularly interspaced short palindromic? [00:25:30] That's the name of the technology.

**Laurens** [00:25:32] Yes I have yes

**Katherine** [ 00:25:32] So many scientists and non scientists say that this is a revolutionary technology, revolutionary in the sense that it will be changing life as we know it. CRISPR, they say would, one day be used to edit embryos for certain genes that would reduce the risks of debilitating diseases, but also to make what is now very commonly turned designer babies. Should we use CRISPR for that?

**Laurens** [00:25:58] Well, not within such a frame of action, [00:26:00] I would say but I need to add something I do not believe that CRISPR at this moment radically changes anything about the human being because the human being has always already been defined by the fact that it is that we are or it is the post evolutionary phenomenon due to the fact that mankind has been able to develop technologies and this has to do also with our brain capacity, of course, [00:26:30] but the fact that we create technologies already elevates us beyond the restrictions of Darwinian evolution. And of course, it's a very important new step that is made by, well, in the first place genetic modification and the second place was because one of the tools that makes it even more easy and this indeed might lead to what a former colleague of mine, once termed Cambrian explosion in vitro and so a True boasts [00:27:00] evolutionary step show indeed we now live in a time in which an acceleration of Darwinian evolution becomes possible you might actually even state that... is proven right after all, because we can now go intervene in the properties of a living organism and these properties of then transfer to a next generation. So there are truly some interesting things happening. The question whether we should use this to create designer babies? Well, I wouldn't say so. [00:27:30] Because it presupposes that we have the knowledge, to know what is better and what not. And this is one of the deeply problematic issues in the very term of enhancement because it presupposes that you can quite easily create a skill on which you can put certain traits of the human being, some of which are negative and others are positive and that this is a this is a skill that you can determine objectively and how [00:28:20] We value certain properties is very much dependent on social and moral, often temporary or localized positioning.

**Katherine** [00:28:09] So let's say the technology becomes safe and does not carry risks that are currently being discussed. There are many that believe for that question, right? Why should we not use such a technology that will make our children more attractive, more intelligent, you can insert any adjective the to find, you know, a valuable, [00:28:30] why do we have a resistance to create those designer babies?

**Laurens** [00:28:35] Well, I suppose a main reason for that is that we turn next generations into an artifact of our own making. So rather than that these are humans in their own right, they merely become the projects of their parents or of the societal conventions, that's the other's parents. So it's the instrumentalization to a certain ideals that any individual or any

community has, which which forms a major objection towards [00:29:00] designer babies, I would say no.

**Katherine** [00:29:04] But many would say that's a moral obligation of parents right? To to bring a child into this world with the best qualities and like without any risks or without any diseases. And they would they would think that they would look at that as moral obligation.

**Laurens** [00:29:22] The moral obligation would be to provide a child as already not that comes into the world to provide that child in its own self [00:29:30] and its own personality with the best conditions as possible to develop him or herself. As soon as you actually design the child in question, then you're not facilitating the child but you're facilitating your own views and desires of what the child should be.

**Katherine** [00:29:50] Are we playing God by editing for DNA or the source of life?

**Laurens** [00:29:55] No, I wouldn't say so not in general. In any case to the very argument of [00:30:00] playing God is a difficult one, it's usually getting up not from a religious background actually, but rather from from background of well, that it is over self confident to presume that you know how nature functions. And if you don't act upon such presumptions, you might create large and unexpected problems. Yes, I would say that we should therefore proceed with care, but I do not see the changing of DNA as problematic as such.[00:30:30] No.

**Katherine** [00:30:32] You know, you just made me think we, the term "playing God" right, is being used a lot when it comes to such really revolutionary and really controversial technologies. That would also maybe, because God probably is always related to a certain religion, or if let's say you're not religious, but let's think of nature. Right? I mean, replate We are now playing nature's role. Like you said, we are speeding up Darwinian evolution

**Laurens** [00:31:00] Oh yea, in this regard we might indeed. So if we would, this of course, also depends on one view of nature and there are many around. And if you would consider nature as a rather fragile balance that has grown over the course of about three and a half billion years, or the since the Cambrian explosion, because then life became more complex than it was before. So this balance has grown over a very long [00:31:30]time span, if we consider that balance be viable, rather fragile, and if we don't start intervening in it, without any let's say, better knowledge of what this balance consists of, yes, it might it might yield problem.

But if we consider this balance to be rather robust, and self correcting in nature, then this might not pose a problem. And so the basic issue here lies on what conception of nature one has, whether one would say, well, we shouldn't do this or we might be able to do it.

[00:32:00] One of the projects that I'm involved in is actually the focusing on synthetic biology. And then specifically in creating a bacteria that can be easily modified and at the same time is as safe as imaginable. So that project is called SafeChassis because as many of these these these research projects and fields in synthetic biology, the metaphor of the machine is often taken as a core aspect or the core issue. [00:32:30]

And and here of the metaphors of course, the chassis of a car, which is done as safe as possible and you can build anything. On top of that, just see whether you want to pick up or just uncomfortable. And so safety is let's say, a core red line of any of the search and social debate or moral debate about synthetic biology. But at the same time, we should not neglect other questions which relate to just distribution as we discussed a minute ago.

[00:33:00] The issue of the natural balance the issue of impact on the environment such as

these, these all vaguely related to safety, but they are not completely answered by the question, "Is it safe?".

**Katherine** [00:33:11] That's, that's a that's a very good point, because I think we are often very worried with whether technology would bring harm or bring risk by using it. But we're not thinking about the societal implications, right, like this might create, such as like, an inequality or disbalances, or [00:33:30] other societal implications. But it also, I just want to point out something about what we were talking about concerning nature, right? It depends on what framework you want to start with, in thinking whether it is nature robust, is it fragile, that we don't know so much? I think this is where we also need to, you know, remind ourselves, you know, probably know like, what 2% of nature, of biology, of neuroscience interested

**Laurens** [00:33:55] We can't even express it in in percentage I think, so..

**Katherine** [00:33:57] Exactly, so we are oblivious [00:34:00] to where we are and what's what's encircling us, our environment.

**Laurens** [00:34:07] But this should of course, not lead to not wanting to do anything anymore. The only way in which we can proceed is through experiments, creative experiment.

**Katherine** [00:34:20] Also, an interesting note, the majority of those who participated in the poll voted that we should not be playing gods. Yes, they are not in favor of genetic editing of embryos [00:34:30] and I think this is the majority of the vibe and current discussion nowadays, especially after the incident that took place last December where a Chinese scientists claim to have applied this technology on two embryos that are now born and awaiting that fate, I would say, because we still don't know whether this technology is indeed risk free.

**Laurens** [00:34:50] Yeah, yeah. "Claimed to have" need some emphasis here. I think because there's often some news from China about technology X or Y, having been successfully applied. [00:35:00] But it's questionable whether this is true or not? I would indeed say that any experimentation you've mentioned this ..is absolutely a moral no no. No, no, no.

**Katherine** [00:35:10] How can we have to deal with the dilemma that certain technologies poses and that on one hand, they can be used to treat incurable and debilitating diseases and this is something we should not forget. That's why CRISPR was invented. And on the other hand, they can be used for destructive or even unwanted actions such as, for example, for military uses. [00:35:30] or if you want to speak of eugenics right? Devastating...that this has created

**Laurens** [00:35:37] Yeah. And that's how science and technology, have always been a double edged sword. You cannot just assume that any application of a technology will be good, but this is a question that counts for the invention of the hammer, as much as it counts for current developments in genomics. To show that there's no let's say intrinsic distinction with regard to [00:36:00] this this issue, of course. So technologies have always been, in the words of Bernard Stiegler a French philosopher, he is about 65 now I suppose. Bernard Stiegler refers to technology as a pharmakon. Pharmakon is a Greek word that seems to relate. And it's of course also at the basis of the word pharmaceuticals. But the original meaning of pharmakon is that it is both poison and

cure. So it's the [00:36:30] same word, and it has a third meaning in ancient Greek, which is scapegoat. So as soon as something goes wrong, we blame the technology as a scapegoat whilst we should actually blame ourselves for not having taken responsibility over that technology.

**Katherine** [00:36:48] Now, this is a question I think that's really internationally being debated specially after the recent events with CRISPR, but who do you think should make the decision [00:37:00] whether we should apply CRISPR or any other revolutionary technology of the like?

**Laurens** [00:37:07] In which context? This also depends on which application I would say. So whom should we ask is, of course, a very difficult question because then you would immediately think about, well, policymakers as they are being advised by scientists. And then these policymakers at the same time need to regulate science. They also need to keep an eye on the interlink between science and industry, pharmaceutical industry in the first place, of [00:37:30] course, then there is regulation on several levels. You've got the national level, you've got the European level, there's also a higher aggregation that which agreements between the United States and Europe are made on these issues. So it's not modest. It's not self evident to discern where the locus of decision making is there are several levels at which this happens. And to my mind, I would say that you always need to keep an eye on the whole complex and this is only [00:38:00] possible if you look at the specific applications in question, and this, of course becomes very problematic if you look at fundamental research, because then you cannot predict which applications will emerge

**Katherine** [00:38:11] For for a technology like CRISPR. Right now, there is a lot of discussion, should we create a moratorium, should we not? Should we go forward? Should we ban it, this topic until further notice? Do you think scientists alone can now stand up and say, No, I mean, even ...

**Laurens** [00:38:30] No against CRISPR you mean?

**Katherine** [00:38:30] For the moment, not against using it. I mean, we know that there are laws already that have been applied and implemented in several countries to completely ban the use of CRISPR or any genetic editing and embryos for Reproductive purposes.

**Laurens** [00:38:46] Yes. But this this relates very much to the problem of personal identity of course, sure. If you block CRISPR for the creation of designer babies, then there is the issue of instrumentalizing austerity and then there is the [00:39:00] the issue of not knowing what risks are involved. So that's that's a, an application field, which is very strong, very strong moral dimension. But if you would do the same thing for, let's say, modifying a type of yeast to be able to produce biofuels in a better fashion than the moral debate all of a sudden changes.

**Katherine** [00:39:30] My final question is looking a bit forward and it's more of a personal question. Are you optimistic or pessimistic about the future?

**Laurens** [00:39:41] It's hard to be optimistic, I would say, but this relates to the way in which we even in the level of our professional field, the way in which we relate to the current state of the world. One of the major problems here is that show you've got people like Aubrey de Grey [00:40:00] an English or British academic, who claims that he will be the first one to surpass the age of 150. And at the same time, there are rather dramatic

reports from the International Panel on Climate Change, or at least from some experts from that panel, who states that in 150 years, this planet won't be able to sustain human life anymore. As so there is a bit of initial prioritization going on there, I would say [00:40:30] in terms of what is necessary in the now.

And if I look at the way in which society tries to organize itself to do something about climate change, I'm not really, it would be naive to be optimistic. Yes. But pessimism doesn't really lead to action perspective as well. Let's show you you should either you should abstain from both I would say you should actually try and find action perspective rather than merely a... attitudes amongst the latitudes of optimism or [00:41:00] longitude of pessimism.

**Katherine** [00:41:02] That's a very nice answer, I should say.

So, Lawrence, have you heard the latest neuroethics News-next May 2020 the new medical devices regulation will come into force in Europe. [00:41:30] There's a lot of neuro tech companies that are selling for example, those stimulators, brain stimulators to be claimed that those who have therapeutic effects and beneficial effects to, for example, alleviate depression symptoms or to increase focus. However, what they don't really claim is that those might have harmful effects on the long term use, and this is where this regulation now will come to protect those non medical consumers. [00:42:00] That's a big win, don't you think?

**Laurens** [00:42:02] Yes, yeah. So so does the regulation extends to the non medical applications as well? Well, that seems to be good news to my mind. However, I would also be careful in this respect because if you look at therapeutic applications, then certain risks or certain harms might, might be estimated as permissible because they, they don't outweigh the benefits of therapy. So someone who's suffering from depression [00:42:30] and that these symptoms are then alleviated to an extent although there are some slight harmful effects this might carry along with, you would still permit the application of such technique.

But if the applications only concern an attempt to increase students focus during an examination period or to come through the current depressing white clouds days of autumn, [00:43:00] then any harm involved might actually be non permissible or should should actually lead to a ban on such uses. On the other hand, we also have to take into account of course, any user has a self responsibility as well. So, if there is a disclaimer stating that the model should have adverse effects to some extent, but this is what these adverse effects on what not overly dramatic, then this might also be seen as part of the [00:43:30] responsibility of the user in question.

**Katherine** [00:43:32] Very well said, I totally agree. And I think what is also nice, it is so refreshing and motivating to see how neuro ethics is really making its way into the European Commission to make changes and set regulations right and to make good changes in order to protect the consumer. So, this is something that we haven't seen for a very long time, I think. And now, especially with the rise of neuro technologies, I think it's a very nice contribution of neuro ethics.[00:44:00] So looking forward to more changes in the future, of course, where neuroethics really informs such neuro technology regulations.

**Katherine** [00:44:17] Well, that's all for today's episode of neuroethics police. Thanks for listening. And thank you to Laurens Landeweerd for joining me today and for sharing his insights on revolutionary technologies [00:44:30] and neuroscience that are making us face existential questions, questions on our human nature, and where we are going as a species. Join us again next month for the final episode of this very first season the final episode of this year with a new neuro ethics topic and a new guests to spill the tea.

[00:44:48]Make sure you subscribe to the podcast on iTunes or Google podcasts or anywhere else. We are also on Spotify, so you never miss an episode. Plus, keep an eye on our website for more information [00:45:00] of the upcoming 2020 annual meeting of the Italian society for neuroethics. More info coming soon from this collaboration, stay curious, stay critical and till next time.

Transcribed by <https://otter.ai>

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