



## Irreverend: Why Machines Will Never Rule the World – On AI and Faith

**Jamie Franklin (JF):** Welcome to this very special episode of "Irreverend: Faith and Current Affairs". I am extremely excited about this one because I am joined by two eminent thinkers, Professor Barry Smith and Dr Jobst Landgrebe MD who are the authors of this wonderful book which is called "Why Machines will never Rule the World: Artificial Intelligence without Fear". I have been grappling with this book over recent days and think this book is highly relevant to many of the themes that we discuss here, particularly things related to transhumanism, Artificial Intelligence, how a global government might utilize technology in order to take over the world and so on. Today, we are graced with two eminent thinkers and I think their accomplishments and interests are so legion that it would be easiest just to let you introduce yourselves. So, Jobst, coming to you first, why don't you tell our audience a little bit about who you are, about your background and your involvement in this book.

**Jobst Landgrebe (JL):** Thank you, Jamie, for inviting us. I feel really honored. For the benefit of this special audience here, I am a son of two theologians. My parents are both Lutheran theologians. My mother comes from one of the oldest and most productive families of Lutheran theologians. The Hochstetter family has really produced hundreds of reverends. By training I am a physician, biochemist and mathematician. I did a PhD in cell biology. Later, I started to study mathematics and became a bio-mathematician. I met my co-author Barry Smith due to my work in medical ontology. I have worked in Artificial Intelligence theory and practice for over 20 years since 1998. A couple of years ago, I saw the necessity to write this book.

**JF:** Yes, excellent. And Barry, a little bit about yourself and your background.

**Barry Smith (BS):** First of all, I was born in England, studied in Oxford and Manchester as a philosopher. I wrote a PhD on German and Austrian philosophy but I gradually realized that there were ways in which the philosophical interests that I developed could be useful in the wider world. So I started applying some of these ideas in medicine and in biology, and that's where I came into contact with Jobst. For the last 20 years, I have been working with all kinds of non-philosophical researchers in the military, in the industry, and still in biology and medicine to show how philosophy can be helpful to their work. The latest exploration along these lines is in the area of Artificial Intelligence which is what we will be talking about now.

**JF:** Okay, thank you. So, I think we should start. Jobst, you just mentioned a sort of a need for this book. I think this book is a really good book because it is an academic book but you often refer to some of the stuff that is going on in popular culture quoting from Elon Musk talking about machines that will soon be ruling over us and they will be our overlords and they will have these capacities and propensities and so on. So, there is obviously something in the culture that is proposing these ideas. We are familiar with the ideas of machines taking over from science fiction, films like the Matrix or the Terminator. These are the things that were coming to my mind when I was reading through this book. It is not really my academic area but it seems to me that in the academic world there is this sort of stream of thought which is expecting science to develop in this direction. Jobst, is that the way you see it and could you articulate a bit more about the need for this for this book?



**JL:** I think that we are living in a cultural age of massive loss of faith in our society which has been observable over the last 200 years. Thinkers of the 19th century like Stirner and Nietzsche but also Auguste Comte already recognized that there would be a new secular religion that would arise. Transhumanism and the belief in Artificial Intelligence are part of the positivist tradition of secular pseudo-religion. Basically, we have now a pseudo-religion that has replaced for many of our contemporaries Christian faith and part of it is the belief of an infinite progress of technology and a view of technology as an eschatological entity. This is what we are also observing in the area of Artificial Intelligence and transhumanism, a belief that we can be our own God – as Stirner and Nietzsche formulated it – by using technology. The book refutes this claim but not using theological arguments but purely arguments from science.

**JF:** That is very interesting. Again, it is not my area but I am aware that in modern Protestant liberal theology sometimes the suggestion is made that the eschaton or the resurrection at the end of the time will be something which is brought about by human technology itself in the form of transhumanism.

**JL:** This is of course a perversion of our Christian religion. Nowhere in the scripture you can find anything about this. There is what Bullman called Present Eschatology in John which means that you can encounter God in the present in another human being but that has nothing to do with us calling in the last days or the Judgment Day. That is nonsense but that is the cultural background against which we have to understand claims by people like Musk or others like Martine Rothblatt who believe in transhumanism and believe that machines will become more intelligent than humans- what they call the singularity.

**JF:** Let us just push that a little bit further. So, would you say that it is in the absence of the Christian eschatology that people feel the need to posit some kind of hope for eternal life whether it is for the individual or for the species. Again, in popular culture there are ideas of cryogenic freezing and things like this. We covered this on the show a year ago. E.g. Jeff Bezos is investing in research of cryogenic technology to preserve part of his body so he could live forever. Is that the way you see it? Is it people attempting to replace the hope of Christian eschatology with something that is brought about by technology?

**JL:** Schleiermacher described in the beginning of the 19th century the religious need which he saw as an existential constant. So, it is a basic property of human beings that they have a religious need. I believe that this is true. There are people who can live without faith and without religion but for most people he was right that they have this strong need. When you lose the traditional faith like Christianity, or in other parts of the world other religions, the religious need which Schleiermacher describes does not go away. That is why when you are overcome by this need you have to find new ways of materializing it. So, this idea of immortality whether it is to be brought about biochemically or digitally – which is also a big idea in these circles – is of this kind of pseudo-faith that replaces the true religion. Barry Smith and I have also written a paper about this called "Digital Immortality" which was – for this audience – unfortunately published in German but we also wrote about it in the book. There is a chapter which contains some of the arguments that we bring forward in this paper.

**JF:** I think this is really a salient theme, this idea that there is a sort of pseudo-religious sensibility which is at play. It is incoherent in many ways but it is still at play in all of these kinds of social issues that we talk about whether it be the Covid situation, whether it be climate change, or whether it be something to do with transhumanism and Artificial Intelligence. There is a sense in which it goes beyond rationality if I can put it like that. I do not want to say it is completely irrational but there is a non-rational element to it whereby people are invested with a sort of spiritual furor around it and there are categories which are recognizably religious like orthodoxy and heresy. When you stray from orthodoxy to heresy the issue is not so much whether what you are saying is rationally coherent or whether there is empirical evidence for it. The salient issue is that you have transgressed some kind of boundary which we have all agreed somehow is unacceptable. I think that is definitely something that we should talk about in the course of this conversation but first we should talk about your main argument because as you say your main argument is not a theological argument. It is not based on any kind of premises other than purely empirical and logical premises. My understanding is that what you are saying in this book is that what you call an Artificial General Intelligence (AGI) is logically impossible. AGI is artificial intelligence which is equal to or above human intelligence. Part of the AGI is that at some point a singularity will occur at which machines can replicate

themselves and create machines which are more intelligent than the ones that created them and thereby set off a chain of events whereby machines will exponentially increase in intelligence and take over the world. Is that more or less what you mean by the AGI and the singularity?

**JL:** That is what the proponents of the singularity like Ray Kurzweil call singularity. We, of course, think that this is utter nonsense. And you have also defined AGI correctly.

**JF:** Then I suppose the next step of that which is presumably even more fanciful is that these machines would then have some kind of totalitarian or malicious desire to subjugate human beings and to create a matrix-like scenario. But you say this is impossible because in order to do that you would need to imitate a human neurocognitive system which is a complex system that is impossible to model. Therefore you cannot create an AI which is equal to human intelligence or can imitate human intelligence. Is that right?

**JL:** You need a model that can emulate the neurocognitive capabilities of the human mind-body continuum. You do not need to build the same thing or something that is very similar but you would need to be able to create the same input-output patterns. Inside, it could look very different from the human brain but basically it would need to be able to perform the same behavior given a certain input – to describe it in a behavioristic way. This means that you need an emulation of the human mind or the human mind-body continuum as we stress in the book. To do this you need to have a model of how to do this. We are mainly arguing against the feasibility of machine based AI. For machine based AI you need to engineer something and for this you need a mathematical model. Every engineered entity contains to some extent a mathematical model. There are also aspects of engineering which have to do with trying things out but the core is always a mathematical understanding of the world mostly using physics or other applications of mathematics. So if you cannot have such a mathematical model then you cannot engineer intelligence. Our main argument is that because the human mind-body continuum is a complex system we cannot have a mathematical model of it that is good enough to enable such an emulation or simulation.

**JF:** Can you talk to me about what you mean when you say a complex system because many people do not properly understand what that means.

**JL:** Almost all natural systems are complex. Only very few can be modeled as being simpler logic systems. So let us start with a logic system, the solar system as a gravitational system. It has the sun in the middle and the planets are moving around the sun driven by their momentum and the gravitational field that the sun creates. This model which was discovered by Kepler, Copernicus and Galileo and then formalized fully by Newton is a simple system because you can use simple linear differential equations to predict its behavior almost perfectly. So, we can really calculate exactly what is going on in the system. This is a logic system. These systems are great for us because the mathematical capabilities of the human mind can be applied to them in order to explain them, to describe them, to create predictions about them and also to engineer new logic systems like the steam engine or the computer or the internet technology we are now using to talk to each other. These are the logic systems. There are very few of them in nature. If you look closely all natural systems are complex and the real logic systems we have are all those which we have built ourselves. Now, what are the characteristics of a complex system? I will not go through all the characteristics. I just mention the three most important ones: (1) The first one is that complex systems have evolutionary properties which means that they can change at any time. They can develop new elements, the elements can interact in a new way and you can see this by looking at human beings how language evolves. Language is a typical complex system phenomenon because all the time your words get invented, new usages of these words, new noun phrases and verb phrases occur and so human language is a very good example for an evolutionary system. (2) The second property I would like to mention is the non-ergodicity of complex systems. This means that mathematically speaking the coordinate system in which the events happen has no regularity. If you imagine what is going on in the complex system it is as many small dots in a coordinate system. The pattern of the dots will always look different and will always be unpredictable. There is never an even or repeated distribution of the dots in the coordinate system. Furthermore, the coordinates of the coordinate system can change. Therefore, if you take a pattern from this coordinate system or a time series and then you think you can now create a system that emulates this pattern, the next time you are confronted with reality the pattern will be different because of the non-ergodic character of the system. I think this is something that very few people understand. It is quite hard to understand but it means that no



matter what you do you can never create an AI system because of the non-ergodicity, because there is no repeating pattern. To give you a very simple example, each wave that comes to the shore of England since England exists and since there are waves on its shore is unique. So, no wave is exactly like the other at the molecular level. They are all different. If you keep on making movies of these waves you will never create an emulation of the waves that are like the natural phenomenon because they are non-ergodic. This is just a relatively simple complex system, and so this is the same for higher complex systems as well. (3) The third property, and then I am done with the academic part, the third one that I want to mention is drivenness. Drivenness means that in a complex system energy is always flowing through the system. It means that because of the conservation of energy the energy that is flowing through the system is transforming itself into different forms of energy which creates what is called dissipation in physics. So, for example, when I pour water into this glass then I have mechanical energy and then I get turbulence in the glass. The turbulence in the glass is a form of transformation, it transforms the mechanical energy into heat. This is called dissipation and this process is chaotic and cannot be modeled. Turbulence in a glass of water or if you have wind in the snow and you see the snow is swirling or you smoke a cigar and see the smoke rising up from the cigar, all these are turbulence phenomena which we cannot model mathematically. And these are only very simple phenomena of drivenness if you compare this to the drivenness of animals or of humans. Because of this drivenness which is characteristic for all living systems and also many non-living systems like the climate system we have no mathematical tools for predicting them. That is also why all the climate models we have are complete nonsense.

**JF:** Yes, I was going to ask you about that because while I was reading the book I was thinking about the other things that we talk about on this podcast like climate change and like the situation with models around the Covid-19 virus. It seems to me that the weather is a complex system and I am not sure about viruses. What about viruses?

**JL:** Let us start with viruses. Let us not take Covid but Ebola. Ebola is a virus that kills 70 percent of the infected people and that gets transmitted via the blood or fluids of the human body such as excretions. So it is not very contagious but if you get it you have a 70 percent chance of dying. Because of its strong characteristics, this virus can be modeled really well using partial differential equations. So, there are epidemiological models that are so good that you can model an outbreak somewhere in Africa really well and you can also model how to contain it. Although the virus and the way of its spreading inside a human population is a complex phenomenon of a complex system there are very strong effects that enable modeling via mathematics that is really adequate. This did not work for Covid because Covid has very different patterns of spreading and in most cases, it is an asymptomatic disease. Therefore, the same models which work really well for Ebola or for rabies cannot be used for Covid. The pattern with which viruses spread in populations are complex. However, with some viruses we have very good epidemiological models due to the properties of how these viruses spread.

As for climate, we do not have this. Climate is a complex system which we do not understand at all. We do understand some partial aspects of it. Like with all complex systems, we can make partial models. So, we have very good partial models of the human sleep-wake cycle or the female sexual cycle. These are almost perfect models but they are partial. As for climate, we have partial models like modeling certain wind patterns that are recurrent or the annual climate change that we have in a certain region of the world. So, there are partial climate models but we do not have convincing or adequate climate models to describe the future of the climate. The reason for this is that we do not understand the causality of the climate because the climate is a complex system. We must see that for structural reasons we have never been able and we will never be able to model the climate.

**JF:** This is not a podcast about climate change but it seems to be so relevant. I am not a specialist in this area at all but what we are told by politicians is that we need to reduce the amount of carbon dioxide that we are emitting and then that will bring the temperature of the world down. It sounds simplistic but that is the message. It does not sound like it fits with what you are saying, does it?

**JL:** I will not make political statements here. I can just speak as a scientist and I would say that the view that we have a mono-causal system that we can influence in this way is very Cartesian and simplistic. In reality, carbon dioxide is of course a greenhouse gas but the strongest greenhouse gas that we have is water and

carbon dioxide is a minor greenhouse gas in the current situation. It is a greenhouse gas but there are many others. And also the greenhouse gasses are not at all the only reason for the climate that we see which has not changed very much. It changed quite a bit during the Middle Ages when we had the small ice age but since the small ice age stopped it has not changed much. If you look at long-term climate evolution the last radical climate change we had was between approximately 10.000 BC when the last big ice age ended. That was the last huge climate change phase we had and since then we had only minor alterations of the climate.

I think that the view that reducing the emission of carbon dioxide will change the climate is scientifically unwarranted. We do not know whether this will happen. We have no idea and there is no way of showing or trying this. There are other very good reasons for wanting to reduce the consumption of fossil fuels. So, it is really stupid to burn them because they are great, they are primary material for the chemical synthesis processes we are running. If we are burning all the nice benzene rings then we cannot use them for chemical synthesis anymore. I have been suffering from this since I was 12 or 13 and started to understand the synthesis pathways in chemistry and how useful this stuff is. So we should not burn them but the main reason is that they are too precious to be burned.

**JF:** Thank you, Jobst, I promise I will not ask any more questions about climate change. I have one more question about complex systems. If you were several orders more intelligent and knowledgeable than human beings are, could you theoretically map complex systems? And if you could not theoretically map them then how can you account for what must be a sort of completely random system?

**JL:** There is a very important difference between causality and the description of causality. In the book which has no theological content at all we describe a purely materialistic worldview. In such a purely materialistic worldview like the one of modern physics, everything that happens in the world has causal factors. So, everything is caused by the four basic interactions: the weak force, the strong force, the electromagnetic force and gravitation. These forces act on the particles that make up our world and they cause everything. The point of complex systems is not that complex system theory negates causation. It just says that in many situations we cannot describe how the causation works. I totally believe in a causal universe but I also know that with the mathematical capabilities we have we can only model a bit of it.

Now, what would be possible if we had let us say 100 times better mathematical capabilities where we could model a bit more. Why could we only model a bit more? Because the complexity of the real world is still so extremely high. Even if our modeling abilities would be 100 times better and we could for example analytically solve partial differential equations with hundreds of variables – today, we can have four or five variables – then it would still be totally insufficient. The human brain has 100 billion cells in which millions of times more molecules interact. So, we have many more variables, and even if we would have hundred times better mathematical capabilities we still could not model it. I think the human brain works in a causal fashion. There are causal effects, but we cannot model them even if we would have extraterrestrial super intelligence because of the complexity of real nature. Even such a super intelligence would not be sufficient to model the complex systems we are dealing with here.

**JF:** So, you are saying that the human brain is a complex system. It would need to be modeled in order to create an AGI which is an Artificial Intelligence equal to or above human intelligence. Since that is impossible you can never have an AGI. That is the argument.

So, the human brain is a complex system which means it is so complex that even if we were a hundred or a thousand times more intellectually capable than we are we would be a million miles away from being able to do it. It is mathematically impossible. Is that right?

**JL:** Yes, if you believe that the mathematical capabilities of human beings are essentially limited. If you believe that they will develop forever and become ever infinitely better then that would not be true. But I think this is naive because obviously mathematics is limited. Every serious physicist, every mathematician who really knows his work knows about these limitations very well. They have all written about it. Einstein, Newton, Planck, Hamilton, all the great mathematicians have written about these limitations. Feynman gives a great example in chapter 9 of volume 2 of his great "Lectures on Physics". There, he discusses a condenser which is for electric circuitry and he gives the cloud as a counter-example which has some properties of a

condenser but for which we do not understand how a storm is forming and how the lightning is caused. We have a very crude understanding only. He highlights this. So, everybody who is professionally working as a mathematician or physicist knows about this limitation. There is this joke, I think Heisenberg told it, that if he meets God after dying he would ask him two questions. First, what is the core reason for relativity, and second, how does turbulence work. And then he thinks God would have an answer to the first problem but not to the second. This shows that the real guys are really humble. Who then believes in artificial intelligence? Engineers who do not understand the mathematics behind what they are doing, they believe it, like Ray Kurzweil or Elon Musk who is also a bachelor in engineering. They have just enough understanding of technology to overestimate what can be done. But they do not have enough understanding to see how limited it is.

**JF:** Yes, that does make sense. So, let us talk to our listeners who are concerned about an AGI taking over the world or human beings creating enhanced human beings and having some kind of global army that can take over the world. You know people who are concerned about some kind of globalist government using technology in order to create a situation whereby everybody on earth is tracked and has a digital ID. How feasible are these ideas?

**JL:** Let us start with the last one. Already in the 1970ies when the trilateral commission was founded Western elites discovered that the digital age could be used to have a much better bureaucratic control over the population. In the 11th century, bureaucracy was introduced slowly in Europe by the Salians. They started to register people in towns so that they could levy taxes. So, this has been ongoing for a thousand years now in Europe. It is a process where everything gets administered in a more fine-grained way. Of course, digital computers and everything around digitization can make this more all-encompassing and profound. This is certainly a trend that is ongoing but that has nothing to do with Artificial Intelligence. Forcing people to use computers, to register by computers, to carry computers in their pockets and so on, this is of course a tremendous way of increasing power. But it does not have much to do with AI. AI can do quite little. AI can do face recognition. It can do personal identification. It can do a very crude form of filtering of language. But because AI does not understand language it is very easy to speak in a way so that the AI will not anymore what you are trying to say. So, the means of power do not come from usage of AI, they come from the digitization. The rest you were asking like cyborgs, armies of clones and all of this is just science fiction. It is technically not feasible and we detail this understandin chapter 12 of our book. Let me give you the two main reasons why this is not feasible. Let us start with cyborgs. So if you want to create a cyborg, i.e to improve a human being by adding technology to the human being into his body, then you need to connect the technology to the central nervous system. The problem with our central nervous system is that the way our sensual organs are connected to the central nervous system makes them hardwired from the moment on the light comes to the retina until the final processing of the signal somewhere here in the brain. Everything is hardwired. So it is an evolutionary adaptation which you cannot change. So, even if you would change the retina by adding some technology you would still have to use the neurons that are linked to the retina and to use the same circuitry. You cannot change this technologically because it is really a very complicated biological system that is hardwired and hard-coded genetically. What you can do is, for example, create tools that enhance our senses like you can create glasses that let you see radioactivity. But what would they do here? They would just translate the radioactivity maybe into a red view of the surroundings that gets more red when there is more radioactivity. But they would still be using the genetically encoded neural circuitry of the brain. So, cyborgization is technically not possible because we cannot change the way that our neurons are wired.

The other aspect is genetically changing human beings. Why is this not possible? Because even a very simple property like body height is encoded by more than 80.000 genetic loci. There are so many parts of the genome participating in the phenotype of even basic properties that we do not understand how this works at all. If you wanted to change it like creating even more intelligent or more obedient humans you would have to understand how the genome encodes these properties. We do not have the slightest idea of this and we will never have. We have an idea of how rare Mendelian diseases are caused because they are only caused by one genetic locus. So, we can actually think of curing those by genetic interventions. Whether we

want to do that is another question. But that is at least technologically conceivable. But influencing properties of the human mind that are encoded by tens or hundreds of thousands of genetic loci, believing that this is possible just shows a lack of qualification and of knowledge.

**JF:** Jobst, the other day on Twitter I saw a video that came from the World Economic Forum. Klaus Schwab was sitting on the stage and he was talking about the way in the future his mind would be able to be connected to the internet. And he would be able to know what people are feeling through this digital connection with them. It sounds like nonsense to me. And from what you are saying I would think the pretty clear implication of it is that it is nonsense. Is that your take on these kinds of things where people are pontificating in this way?

**JL:** Klaus Schwab's book "The Fourth Industrial Revolution" that we also cite in our book is a collection of utter nonsense. It contains only real nonsense. This man has never read a textbook of biology, neuroscience, medicine or physics. He has no idea so he is confabulating about nano robots that will cut out cancer cells from our body. He does not even look at very basic stuff, for example that such a robot would not be able to move in the intercellular space because of the scallop theorem. In the book, we explain basic theorems from physics that prove that he is absolutely wrong. It is insane that he has no clue of the most basic things and is confabulating like a madman. I do not understand how he can get away with it. It would not have been possible a generation ago. I think the reason is that nowadays so many journalists also lack education. The quality of the education system has gone down and now we have so many journalists who are so poorly educated. That is the reason why they spread this uncritically because they are intellectually incapable of understanding what nonsense it is.

**JF:** I think that should be quite comforting to people because there are lots of people who listen to this podcast who have heard about those sorts of ideas that Klaus Schwab puts about in "The Fourth Industrial Revolution" and through various public pronouncements. They sound in many ways quite scary because it sounds like this technology will be utilized in order to control people, in order to track people, in order to enhance people and all kinds of things that normal people probably do not find very attractive or compelling.

**JL:** He reminds me of Dostojewski's Grand Inquisitor in "The Brothers Karamazov". He is also arguing that you should control people by fear and I think that is what is going on. If he is as good as the Grand Inquisitor he himself does not believe in it but maybe he is not. Maybe he believes it himself. I cannot judge this.

**JF:** I think the Grand Inquisitor's critique of Christ is that Christ wants to give people the freedom to choose but freedom brings about anxiety. So, what the Grand Inquisitor is going to do out of the benevolence of his heart is that he is going to take away their choice and control them. It does seem to me that a lot of this kind of technocratic impulse operates along the same lines. You know people are too stupid to be given a choice and it makes them anxious anyway. So, we better take control and of course technology plays a massive part in that.

**JL:** But another aspect is important as well. In the medieval period, scare stories which Luther also criticized were completely irrational as well. Even from the perspective of medieval thought they were wrong and the good people knew that they were wrong. But they were still told for this purpose. I think the whole stories around "The Fourth Industrial Revolution" are told from a similar motivation. They are scientifically complete nonsense. They are told for a different reason not because they have any relation to scientific reality.

**JF:** Let us come back to the argument of the book. One of the things I found surprising about the book is this analogy that needs to be drawn between machines and human beings in order to conceptually understand what an AI or an AGI could actually be. It seems like the book is as much about anthropology in that sense as it is about machines. So, in order to believe in an AGI you have to have a basically deterministic view of a human person because machines are essentially algorithms. You have inputs and you have outputs. And those outputs may be very complex but nevertheless they are still outputs. There is no will in a machine. A machine cannot will something unless it has been programmed to do that. Now, in philosophical terms somebody who believes in free will would be called a compatibilist. And somebody who does not believe in free will would be called a determinist. If you are a compatibilist in that sense you could never have an AGI that is equal to a human being because there is no way a machine can have a will which a compatibilist

believes that a human being does. We are not pre-programmed to do everything that we do. We are not physically determined but there is some element within a human being which actually chooses. Am I right in thinking along these lines?

**JL:** In the book, we manage to actually argue against the possibility of an AGI without speaking explicitly about the idea of a free will. So, we dodged the question and that has very good philosophical reasons. Barry and I have slightly different reasons. Barry could comment on this but my reason is that I think that the question whether there is a free will or not is philosophically not answerable. Kant shows this really elegantly in his antinomies from the "Critique of Pure Reason". That is a passage where he shows this very convincingly. Therefore, I do not want to base a scientific argument on a question that cannot be answered. But it is certainly so that even if the entire world we have is ultimately somehow determined in a way we do not understand, in order to emulate the will in the way we subjectively experience it we would need to model it mathematically. And because we cannot do that we cannot emulate the will in the machine. So, even if the will is not free but the experience of our own will is an illusion even then we cannot create a machine with a will. And I think this is the good thing that we do not even need to assume free will in order to say we cannot create a machine with a will. If we are allowed to use theological arguments in addition then it becomes even much simpler to argue against a machine having a will. But, of course, positivists will not accept theological arguments. Barry and I were writing a scientific book so we use only arguments that are acceptable in a scientific context.

**JF:** Barry, do you have anything to add to that?

**BS:** Actually, I do not think that we say enough about the will in the book. I agree with Jobst about the open question whether the will is free, a question which will probably never be settleable. But I would like to hear him say a little bit more about why we cannot model the will. I sent him this morning a press release that AI engineers had finally defeated the game of Diplomacy. The game of Diplomacy involves the exercise of will including the creation of coalitions with other players and so forth. Now AI can beat human beings playing Diplomacy. So maybe he can comment on that.

**JL:** Thank you, Barry, for sending this. So, the AI is now among the 10 percent best players of Diplomacy. This is quite remarkable. Why is this feasible although the machine does not have a will? It works like this: I played Diplomacy quite a lot when I was a teenager. In Diplomacy, you ultimately obtain points for what you do. So, you have a closed-world situation where you can model the behavior and the incentive for the behavior just with this point-based system. Also the dimensions of the space in which the game is evolving does not change and it is fairly limited. If that is the case like in Diplomacy then you can emulate such a game with neural networks and reinforcement learning. That is what they did and it is a very impressive result of modern engineering. I am not saying that this is simple or not really remarkable but it has nothing to do with free will. Just by having billions and billions of runs through games, the machine can learn how to optimize and to obtain the maximum number of points. Whenever that is the case, whenever such a simple utilitarian framework can be applied in a situation with limited variables, limited dimensions, unchanging elements and unchanging relationships between these elements then you have not a complex system anymore. Then you have a simple system and this together with the possibility of rewarding the machine allows you to calculate an optimization algorithm called reinforcement learning and that is how this works. Like in other games such as the game of Go, for example, the machine can become as good as or better than a human being. But that is not an open-world situation where you have changing environments and you cannot assign points to an outcome. In an open-world situation, you cannot use reinforcement learning to get the machine to learn the behavior. You will have miserable failures. We do not have a long chapter about the will in the book but overall the problem is that we do not understand how the will works. What we can do is to give the machine simple goals like those needed to win the game of Go or the game of Diplomacy but we cannot emulate the will.

**JF:** Can we talk a little bit more about anthropology? There is another strong aspect of the book that comes through. In the book, you utilize various other areas of anthropology or fields of study which in some way describe what a human being is or what a human experiences. For example phenomenology which is about the way human beings experience the world and how they understand their own experience. You talk about the ecological school of psychology which says that human beings are intrinsically linked to their environment



and you cannot understand a human being without understanding the environment that the human being is in. You talk about sociology and social ontology which again is about the way that human beings need to be understood with relationship to one another. The thrust that I got from this is that in trying to model what a human being is, all of these complex factors make it much more difficult to conceive of how a machine could even theoretically be able to encompass all of this. Am I understanding that correctly?

**JL:** Basically, we are using the phenomenologist Max Scheler and his pupil Arnold Gehlen who was one of the fathers of the school of philosophical anthropology. In the early chapters of the book, we are using them to explain our view of human beings. We use this school of thought to define intelligence, but also to define what the fundamental drivers of the human way of being are. On one hand, the human being is always a social entity. He cannot grow, cannot become an adult without social interactions. He needs social interactions all of his life. But even if you look at this western fiction of the human as a pure individual which is a big theme since Classical Greece in our culture even then the system is very complex. But when it interacts with other complex systems you get a system of complex systems and it enables novelty all the time. I think that this tension between seeing human beings as individuals with their rationality, their autonomy, their subjective freedom of choice and considering their social character has created the incredible dynamics of Western civilization and the evolution of Western civilization. That is how Western civilization came to change the world entirely. This just illustrates the incredible complexity of this system that our species forms.

**JF:** Another thing you talk about is really interesting. You say there is a lack of models concerning neuroscience particularly when it comes to deficiencies in brain function that give rise to things like autism and schizophrenia. So, science is about the ability to describe, explain and predict things and the brain just cannot be explained or predicted particularly in these areas where there appears to be something wrong with the brain but we do not really know what it is.

**JL:** You can also take simpler diseases like Alzheimer's disease which is only a neurodegenerative disease where basically cells die or Parkinson where cells in a certain area of the brain start to die. Even for these diseases, we do not have adequate disease models. But for schizophrenia, chronic depression or deep personality disorders, we have no idea how they arise. We can try to understand them better but we have an essential limitation of explaining and also treating them. We have to accept this. The same is true for many types of cancer. So, I believe that these dreams that modern medicine can win the war on cancer or that you know find a cure for Alzheimer's disease or for schizophrenia are dreams that have arisen because of the early success of Cartesian medicine. The invention of insulin, painkillers, synthetic morphines, synthetic hormones, there was a lot of incredible progress between 1900 and 1980 in medicine. That was the time when the monocausal or oligo-causal aspects of the human body were exploited technologically. There are some that you can exploit really well. Then people have extrapolated from this that there is a linear continuation of this progress and they failed to see that once certain fruits have been harvested it becomes systematically more and more difficult and that less and less progress is to be expected in the future in medicine. We have to live with this.

**JF:** Jobst, you describe it as Cartesian medicine. I am assuming that has to do with Descartes' dualistic view of the human being.

**JL:** It has more to do with his simple mechanical view of causation. For Descartes, you can mathematically describe everything that is going on in the human body. It is a French tradition, later on Laplace or La Mettrie were also in this tradition. They believed that with relatively simple laws you can explain everything that is going on in the human body and then change it at will. That is also what is then in August Comte's positivism of which you find remnants in neopositivism and today's postmodern positivism. This Cartesian idea that we can influence things at will because everything has a mechanical explanation is total nonsense. I mean everything is caused by something but it is not so simple. The idea that the medical progress is infinite because of this Cartesian explanation shows a lack of understanding of the complexity of these organisms.

**JF:** There is also the question of what the mind actually is with relation to the body. In the book, you want to strongly argue against Cartesian dualism which separates the mind and the body. This idea assumes that the body is essentially just like a machine and the mind is a sort of spiritual homunculus, a little spiritual man in the body interacting with it. You want to move away from that and you want to say that the body and the

mind are in some kind of continuum with each other. I would like to hear more about that. I would like to ask specifically as a Christian where notions of the soul and the spiritual interact with that picture of the human being.

**JL:** Let me quickly answer the first question. In the book, we expose a materialistic monism which says our bodies are made of matter, all processes in the body are interactions of particles of matter governed by the four laws of interaction that physics describe. This is to simplify the theory of the book. There is no soul in this argument. It is a purely scientific view, this is my view as a scientist. As a private person, I am a Christian. As a Christian and as a private person, I have a very different view. I believe that we are created by God and I think that we cannot understand fully the existence of creation. But we have to accept as part of our faith that we are created with a mind-body continuum and a soul. Then I am indeed a dualist in that I believe that there is a soul on one hand and the mind-body continuum on the other hand. Scheler also proposes dualism because as a philosopher he was mixing scientific views with theological views which I do not do. But personally, I believe in this dualism that Scheler describes between the soul and the mind-body continuum. Therefore, the soul is eternal because it is separate from the mind-body continuum. It is as the Bible says added to the body.

**JF:** I see what you are saying but the properties of the soul must include things like willing, understanding and things which you would normally associate with the mind.

**JL:** I think the two greatest thinkers who have thought about the person are Duns Scotus and before him Boethius. They do not write so much where the capabilities of the person are located. They just assume that we are created by God and now we exist. Then they ask what makes us human and answer that it is autonomy, intelligence, independence, individuality, self-consciousness, responsibility and sociality. This is basically what Boethius lists as properties of the human person but he is not trying to attribute this to a certain place. And I am also not inclined to do this so much. I rather think it is better to leave this question open and that the scripture does not force us to locate the properties somewhere. We can just assume that we were created like this to have them.

**JF:** Ok, on the one hand we have the mind-body continuum and then on the other hand we have the soul. It seems to me that the soul and the mind need to have some kind of continuity with each other in order to make sense. The soul survives death but that must mean in some sense that the person that we really are survives death with our will, with our love, with our thoughts and memories.

**JL:** I am not a specialist for this. I am not a theologian. I believe in eternal life and that the soul is the bearer of eternal life but in which form this is actually happening is speculation. I do not like speculation that much. So I am not going to that level of detail. What is important to mention is that Duns Scotus was the first to highlight that sociality is so important. He says, "*quamvis in re non sit persona, nisi quae est ad alterum*". That means we have to be aware that there is no substance of the person without being with others. I think this is a very important insight. He was one of the geniuses of late medieval theology and philosophy. And I think we cannot go beyond this. This is really it. Modern sociology has basically rewritten this in new language but they repeat what he says. Basically, we cannot live without others and he says this in a very beautiful way because he says that there is no substance of the person without others. I just want to mention this because many listeners may not know where it comes from. I think it is so beautiful.

**JF:** Yes, indeed it is. I will not push you any further on that. But I am interested to hear your view about things like demonic possession in the Gospels. It just rose to me when I was reading a bit about brain function, schizophrenia and things like that. Do you have any thoughts about that? I know that would have to be in the private person category. With things like schizophrenia as a scientist one would want to say that this is some kind of malfunction in the physical brain. But the gospels depict people as being demonically possessed. Do you have any thoughts about that?

**JL:** Yes, I have a very strong opinion. I believe that schizophrenia is a biochemical process and that possession is something else. If you look at schizophrenics they have biochemical defects in their neurons which is what creates schizophrenia. Even if they believe other things. As a young psychiatrist I treated a young woman who thought that she was possessed by the devil. She heard him speak inside herself. These were just broken neurons. She was not possessed. I do not believe in it at all.

However, I believe that there is evil. Now, what is evil? What is possession by evil? So Bultmann, one of the greatest theologians, says that sinning, which is a basic condition of our existence, opens the door for evil. Then once you commit real evil you get into a cycle of sinning so that your sinning intensifies beyond the normal level. So, we are all sinners. Otherwise we would not need grace, we would not need God and we would not need Christ. But when you are evil and you are – what is called in a more archaic language – “possessed” then you are in a cycle of intense sinning and of forgetting God, escaping from God, ridiculing God, negating God. This is, I think, evil. So, what was called possession in the times when the Gospels were written I think is just indulging in sin. There are people like this and it is not my job to list them or to judge them. That is what Matthew 7 tells us not to do.

But there are such people and they feel comfortable with sinning. And that is evil.

**JF:** So, in the gospels when Christ casts a demon out of somebody how would you see, for example, the demon Legion that is cast out and transferred to the herd of pigs.

**JL:** For me this story means that God in the person of His own son who is God at the same time has the ability to free us from evil, even from evil of the worst and most terribly kind. The way the demon talks in the Gospel of Mark is one of the best passages in the whole New Testament. The demon says, my name is Legion, for we are many. So, he speaks in plural. When Jesus casts him out that means that God has the power to free us from evil, to free us from the cycle of sin even in its deepest and most terrible and terrifying form. That is what this story tells us. I believe that this is true. This is what Luther means when he talks about the freedom of a Christian. We obtain this freedom because God frees us from sinning, but not only from sinning, which we all do every day because sinning is just forgetting about God, but from the worst form of sinning which is sinning in self-indulgent denying of God. So these stories from the gospel tell us that God can even overcome this and this is what makes these stories so powerful and why they are at the core of our faith.

**JF:** It is very interesting. I thought about that a lot, so I am just listening. I am not evaluating. But let me ask you something else. This conversation raises so many important things now. You are saying that human beings are incredibly complex. From a theological perspective you would want to say that this is a reflection of the manifold wisdom of God in creating not just human beings but the world, the universe and creatures that really we need to have a sort of humility before all of this. But then at the same time if we are saying that everything is subjected to the law of causality, that it could in theory be explained the question I have is are there things about human beings that science simply cannot explain, things like for example feelings. Are feelings chemical processes? Are they something to do with your soul or your spirit?

**JL:** I think this is the most important point of our discussion. I have struggled with this all my life. How can I be a Christian who believes in the miracle of salvation and the resurrection and at the same time I believe that the world is made of matter and governed by the four basic interactions that physics describes. I think the only way to do this is to accept that there are three different kinds of knowledge. The first kind of knowledge is the positive knowledge we have of the empirical world. For the positivists, it is the only knowledge that we can have. The second kind of knowledge is *Bildungswissen* which is the knowledge about culture and socio-cultural norms which comes from reading books, from looking at works of art, to which also philosophy belongs. The third kind of knowledge is the theological knowledge, the knowledge of salvation. I just live with the fact that as for the first two types of knowledge, I can combine them. So, the book Barry and I wrote combines the first two types of knowledge. But as for the third type of knowledge, I cannot really combine it with the others. I have to live with the fact that this is so and I do not mind. If you read Thomas Aquinas, the attempt to bring all these types of knowledge into one system that is free of contradictions, I think that is impossible. We have to accept this and live with it. That is what Rudolf Bultmann calls the decision to believe, to be faithful. Faith needs to come from inside of you which is a revelation. But you can also accept that it is incompatible with the scientific view of the world and just say it does not matter and accept this. And that is what I do.

**JF:** That might work for the individual but what if you were talking to somebody who is an atheist who says the world is matter and I have got no need to posit some kind of extra explanatory phenomenon, so why should I believe in a soul or anything spiritual?

**JL:** Basically, this is the question: why should I be faithful. The only theology I really know about is Protestant theology. There is the revelation which reveals the presence of God to us and we are asked to listen to this revelation. This is one strong argument. The second argument is that for me at least I could not make sense out of my life if I was personally a total materialist. I could not personally make sense of my life if I would be an atheist because I could not understand the suffering and the difficulties of living in this world. I would not be able to make sense of my life in this world without believing in God. I would feel overwhelmed with the responsibility I have and especially with my own insufficiency and my own defects which is what Luther called sin. I could not cope with it. Now, the materialist may say, well, then you are a wimp. But I do not care. I do not see a necessity in convincing an atheist if a person chooses to be an atheist. I can only quote Psalm 14 which talks about people who do not believe in God. It is their problem.

**JF:** The thing is when I think about the human person I am resistant to the idea that the language of physical causation could be exhaustive. I would want to say that things like certain types of emotion or certain types of spiritual experience or spiritual feelings could not in principle be described using language pertaining to the laws of physics. There is something about that which is esoteric and ultimately eludes that language.

**JL:** I think that our inner experience of our emotions cannot be described at all using physics.

**JF:** Okay, but then some people would want to say those are just chemical reactions even if we do not really understand them then we will in principle one day.

**JL:** That is what we say in the book and that is my view of the world as a scientist. But as I said before at the same time I have also participated in knowledge of Salvation as Scheler calls it. In this part of my existence I believe that the explanations of physics are insufficient. I have to live with the fact that I cannot bring these two worlds together in myself. I think that this is also what is called the challenge of Faith. You have to accept that you cannot understand every aspect of it and cannot make it contradiction-free like Spinoza and Thomas Aquinas wanted it. They wanted to make faith completely rational, contradiction-free. They wanted to have a perfect dogmatic edifice. You will not get it and that is what the Bible says, all the Psalms says, the Jewish tradition says it, but also the New Testament. You can see it everywhere that we have to accept the limitations. That is why it is faith and not rationality.

**JF:** This is really interesting and I think we have to pick this up again and do this in another episode. We are running out of time for this session. So what I want to do is I just want to open up and ask you, Jobst or Barry, do you have anything that we have not talked about which you would like to get in at this late stage in the conversation.

**BS:** I think that the conversation you just had in the last few minutes leaves a feature of the book untouched. So, in the book we talk about the brain as a physical object made of physical particles which are governed by physical laws. But we also say that we can know very little about the way those laws work because we have no way of gaining the necessary information about the behavior of the particles in the brain. But also it is a complex system and so we cannot use physics in order to make predictions about how the brain works. I would also like to mention that Jobst just gave a 16-hour long lecture in Buffalo on quantum physics. One of the lessons I learned from that is that physics does not really know all it needs to know about the way physics works. So, it seems that we have no clear idea for instance about what a particle is. That means that what we say in the book, namely that the world is made of particles and governed by the four forces, has to be taken with a certain pinch of salt if we are going to take quantum physics seriously.

**JL:** So, if we take quantum field theory seriously then we have a big problem of understanding matter in physics. I think it is a nice way of ending the conversation and I cannot go into detail. This would be a third episode to talk about quantum field theory and what its philosophical and theological implications are. But what is certain is that the best mathematical description of nature we have is quantum field theory – and general theory of relativity as well but let us take this aside. Now quantum field theory shows us that we do not really understand how matter works. So, the positivist view of nature is very superficial and the more you learn about real physics and what the results are that we can derive from it the more humble you become. That also opens very much more space for faith or for an alternative view of the world or for a philosophical view of the world that is not only purely materialistic and based on simple ideas of causation. So, my biggest intention with the book was to show the limits of science, technology and mathematics and to highlight that

we still live in an age where we overestimate totally what we can do with this. It is like the religion of our time to overestimate the reach of technology and science. I think the better you know it the more humble you become and the more clear it becomes that many phenomena in our lives cannot be explained at all with it.

**JF:** Well, I think that is an excellent place to end. Generally, I want to have another conversation and explore this theme because it raises all sorts of questions to me. I think that is a fascinating note on which to end. So, Jobst Landgrebe and Barry Smith, thank you for coming to this episode of Irrerend.

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