

Recapitulation

Welcome to Physics and Religion, a series of podcasts exploring the interaction between modern science and traditional religion. I am your host, Dr. A. S. We have been exploring the closely related issues of consciousness and free will. In this and the next lecture, I would like to summarize and finally explain my own thinking on these issues. I hope you have been following along, especially the last few lectures on physicalism and free will.

In order to live a moral and spiritual life is necessary to be conscious and have free will. Nothing else makes sense. This is certainly true in the Judeo-Christian tradition and I daresay it is true in all other religions as well. Our investigations however have met with obstacles and frustrations at each turn. Some of these can plausibly be attributed to our lack of understanding. Perhaps we will one day build a computer that thinks like a human being. John Searle's Chinese room argument may be too simplistic, as Daniel Dennet has claimed. Perhaps some massively parallel neural architecture will achieve self-awareness and independent thought. Even if we destroy our civilization first (and I am not optimistic) it might still be one of those things that might have been done. How does the brain process visual information? We know a little about the first stages of this processing. They are wondrously complicated, but there is nothing supernatural about them. Perhaps that is true of everything else the brain does. I see no reason why this should not be true.

There are other problems having to do with definition. For example, what is free will? I suggested the most natural approach for a physicist; devise an experimental definition. Alas, I was not successful even using so far-fetched a device as a time machine. I then suggested three definitions that philosophers have considered. They all seemed objectionable in one way or another. I would like to add my own definition, which is simple, clear cut and easy to discuss. Let's say that I have free will to the extent that I can decide to do something and then do it. I realize that my decision might be influenced by drug addiction, armed robbers, irate mothers-in-law, or state and federal laws and regulations. No matter. Suppose I am handcuffed, gagged and tied to a chair. Now I really have

free will; I realize that I am not strong enough to break my bonds so I decide that it would be pointless to try. Recall Dr. Libit's experiments in which an action potential appeared in the subject's EEG a few hundred milliseconds before the subject decided to perform some simple task. Again, according to my definition, this in no way reflects on free will. The key word here is "decide." The subject decides to move his or her finger. Dr. Libit's experiments only show that there is a subconscious aspect to decision making. I presume that is true in general.

How might one not have free will? Kenneth Parks, the sleepwalking murderer, did not decide to murder his in-laws. He couldn't; he was asleep; he didn't have free will. There is a bizarre neurological affliction called coprolalia, a form of Tourette syndrome, in which the sufferer yells obscene and vulgar epithets at random intervals. People don't decide to do this; to that extent they have no free will.

Could free will be negated by some form of predestination? Einstein's block time universe is a particularly clear-cut and yet confusing example. Suppose I make some decision, let's call it D. According to Einstein, D exists in the block time universe. Note that it is logically contradictory to say that it has always existed, since "always" carries with it a sense of temporality. It is equally contradictory to say that D happens now. "Now" is also temporal. Finally, it is wrong to say "predestined," since "pre-" implies time. We arrive at the paradoxical position that D is predestined in a world where predestination is logically impossible. Let's attack this problem from another angle. Suppose we devise some experiment to test whether block time is the correct description of reality. Whatever test we devise and whatever the results of this test are, they are present in block time. It is impossible to get a "wrong" answer. Any theory that cannot under any circumstances be proved wrong should not be taken seriously.

Finally, could free will be compromised by some sort of physical determinism? As I explained in the previous podcast in connection with chaos, causal chains dissipate. To get an idea how quickly they dissipate consider the following thought experiment. Fifteen billiard balls are placed on an idealized pool table. There are no pockets in this table and everything happens without any energy loss due to friction. The balls are struck with a queue ball and they continue to

bounce around the table. The collision of two balls on a two-dimensional surface is the simplest sort of deterministic interaction. Nevertheless, it has been estimated that in order to calculate the trajectories of the balls for more than a few minutes it would be necessary to take into account the gravitational attraction of each electron on the other edge of the galaxy! Needless to say, a computer that could do such a calculation would have a larger gravitational effect than a single electron. This leaves open the possibility that our decisions could be influenced in a deterministic fashion by events immediately preceding the decision. But then, how could it be otherwise?

My simple definition captures the essence of what I think of as free will. If you are willing to buy into it, the question whether or not you have free will is a meaningless question. You should probably be thinking about something else.

Consciousness presents the second great problem of definition. The question is not so much whether we have it or not. I presume that we have consciousness although not everyone agrees. The question is what it is that we have. Rene Descartes established the intellectual landscape by postulating dualism. He claimed that there were two “substances” as he called them. Today we might say that there are two realms or two distinct ways in which things might exist although philosophers are still struggling with this. He called them body and mind. “Body” refers to everything physical but particularly the brain with all its neurons, synapses, glial cells, etc. “Mind” refers to another kind of reality. This is the realm of the soul, the realm of thinking and praying, it is the same realm as God and the heavenly powers. There is nothing physical about mind and it has no location in space. This makes good intuitive sense until you start to think about how something purely non-physical is going to interact with something completely physical. Then you have to allow for philosophical zombies and ghosts and suddenly dualism seems like a bad idea.

The natural alternative is monism, the doctrine that there is only one – for lack of a better word – substance, whether it be mental or physical. We looked at the idea that everything is mental in connection with free will. It didn’t seem like a promising starting point for any sort of philosophical investigation. We also

considered physicalism, which seemed objectionable for several reasons. There are two other alternatives or classes of alternatives, panpsychism and emergentism. I will consider these two in turn.

Welcome to Physics and Religion, a series of podcasts exploring the interaction between modern science and traditional religion. I am your host, Dr. A. S. This is my last podcast on the subject of free will and consciousness, at least for the time being. My next long series will be about cosmology. At the end of the last lecture I left you with two alternatives to consider, panpsychism and emergentism.

Panpsychism is the doctrine that mind is a fundamental feature of the world, which exists throughout the universe. This is a familiar theme in primitive mythology as well as modern fantasy literature. The ancient trees, the Ents, in Tolkein's *Lord of the Rings* are undeniably consciousness, but for those of us who would like to explain everything in purely physical terms this seems like an implausible view. However, it has been very difficult to accommodate consciousness into any sort of physics-only world view, so panpsychism holds some appeal. Panpsychism stands in stark contrast to its main rival emergentism in that it assumes that mind suffuses the universe whereas emergentism asserts that mind emerges only in certain very rare and special circumstances.

I suppose the strongest argument for panpsychism is that consciousness – human consciousness for example – should arise out of inanimate matter, seems intuitively impossible, but there are other arguments in favor as well. Take for example the behavior of primitive organisms such as protozoa. It seems they have clear-cut motivations to find food and escape predators, and they are capable of learning from experience. This seems like a primitive form of consciousness; from where did it come? The most popular argument for panpsychism comes from Darwinian evolution. This assumes that evolution is a continuous process that molds pre-existing properties into complex forms, but which cannot produce entirely novel properties. William James challenged us to conceive of

consciousness in such a way that it did not seem like an interruption into the universe of a new nature non-existent until then.

It is easy to think of counterarguments. There is no evidence that electrons and protons have anything like consciousness. If they do, it is causally impotent; the laws of physics, so far as we know, are closed at this level. There is also a serious problem with combination. Contrast a fully conscious human being with a boulder containing the same number of atoms. Why is it that the woman is conscious and the boulder is not in any meaningful way? The panpsychist would have to reply that when the conscious atoms are combined *in a certain way* human consciousness emerges. But this is a form of emergentism, which is just what panpsychism was supposed to avoid. Perhaps the most serious counterargument is that the theory is empty, it cannot be disproved, it doesn't go anywhere, it leads to no further insights into the nature of reality.

Its rival emergentism claims that emergent properties, structures and capabilities arise out of more fundamental entities and yet are novel or irreducible with respect to them. For our purposes, the question is whether consciousness is an emergent property of the brain. The words "arise," "novel" and "irreducible" are ambiguous and this has given rise to a bewildering assortment of emergentist philosophies. I can't imagine reviewing all these theories in a single book, let alone one podcast, so I will content myself with describing two of the major issues.

The problems turn on the nature of supervenience. Recall our half-serious definition of supervenience from a previous podcast: B is supervenient on A if it is true that if God created A then B would follow automatically and even God could not prevent it. With this in hand let us take a look at what I take to be the majority view. I go by the forbidding name supervenience emergentism. It holds that the physical world is entirely composed of physical structures that might be simple or composite, but the composite structures are arranged in layers or strata in order of increasing complexity. The existence of layers is a consequence of novel properties that appear as a consequence of the complexity. Water makes a good example. Hydrogen and oxygen are simple structures but when they are

combined into water molecules, they exhibit a fabulous range of novel features. Think of the enormous complexity and variety of snowflakes. Furthermore, along with the novel properties there are novel laws that are fundamental in the sense that they are not reducible to the laws governing simpler structures. In some cases, these laws have effects on lower level structures, in which case we talk of “downward causation.” Obviously, snowflakes have no effect on water molecules, so in this case there is no downward causation. We would like to think however, that consciousness is an emergent property of brains and that our conscious thought can influence the world around us via our brains.

I need to define another philosophical term, “brute fact.” A brute fact is something that just is, there is no explanation. For example, why is the mass of an electron .511 MeV? I don’t know. Don’t ask. It just is. That’s the way things are. There is no explanation. It’s a brute fact. Supervenience emergentism is just such a fact. It happens according to fundamental laws that are themselves brute facts. This is the received view, but philosophers have become worried whether these fundamental laws allow for downward causation. Remember one last philosophical term, epiphenomenalism. This holds that consciousness has no effect on the brain. It’s like the rainbow over a waterfall or the steam coming out the train whistle. The rainbow has no effect on the waterfall and the steam has no effect on the train. As I argued before, it may be logically impossible to disprove this, but it seems wildly implausible and philosophers don’t want to be stuck with it. Unfortunately, supervenience emergentism seems to lead inevitably to this position.

There is another problem however, which from the point of view of the resolute materialist is even worse. I said a few minutes ago that supervenience emergentism starts with the assumption that the physical world consists entirely of physical structures. This is physicalism broadly conceived, but it seems that some properties that supervene on physicalism are not themselves consistent with physicalism! Maybe this is just a technical issue that can be overcome by fine tuning the definition of supervenience. For example, Terrence Hogan developed the notion of “superdupervenience,” which is supposed to do the job. According to this concept B superdupervenies (my spell checker doesn’t like that word) on A

if we can come up with a robust scientific explanation of how this all comes about. We can do that with snowflakes; snowflakes superdupervene on water. In the case of consciousness that is just what we cannot do. I will close with a long quote from a 1999 paper by the philosopher Jessica Wilson.

I, for one, am prepared to agree that not only that it is currently more or less opaque how the various properties distinctive of mentality might be explained in terms of physicalistically acceptable properties, but also that given the seemingly *transcendent* nature of certain features of mental properties, compared with features characteristic of physical properties, it is likely that there might never be any such explanations, even in principle.

This is the perfect summary of the contents and conclusions of these series.

Now is the time to circle back to the central theme of these podcasts, the significance of modern science to traditional religion. Recall that I told you in my introduction that the study of consciousness and free will was significant, not because of what science can tell us, but what it can't. What it can't explain is summarized beautifully in Jessica Wilson's long sentence: "... the *transcendent* nature of certain features of mental properties."

I must emphasize that I am not attempting a God of the gaps argument. I am not saying that because science cannot explain these things there must be a God. That sort of argument is justifiably in ill repute. I am also not trying to resuscitate Cartesian dualism. I am not saying that consciousness and free will are part of some non-physical "substance." I am saying that consciousness and free will flourish in a kind of sanctuary or protected arena inaccessible to scientific scrutiny. I hope my analogy with meaningless questions in quantum mechanics will clarify my point a little, although I admit it is rather far-fetched. The issue is the direction of an electron's spin. We can assign it a direction by doing a measurement, but the question, what is its direction in the absence of any measurement? is a question that science can't answer. There is nothing about

electron spin that would bother the most resolute physicalist, but the question about its direction simply cannot be answered scientifically. In the same way, these famous questions such as: do I have free will? or what is it like to be a bat? cannot be answered scientifically.

Finally, let's return to the perennial question, is there a conflict between science and religion? If I am right, then in the matter of consciousness and free will, there cannot be conflict, as Jessica Wilson would put it, even in principle.