Bruce Gordon: Idealism, Quantum Mechanics, and the Fundamentality of Mind

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Michael Egnor:

Welcome to Mind Matters News, this is Mike Egnor. I have today the great privilege and pleasure to speak with Bruce Gordon. Bruce will shortly be a professor at Saint Constantine College in Houston, and the upper school he'll be teaching logic, mathematics, and science. And in the college, he'll be teaching philosophy and science in the humanities. Bruce, it's always, always a privilege to talk with you and welcome.

Bruce Gordon:

Thank you very much. It's again, a privilege to be here.

Michael Egnor:

Thank you. I had mentioned in an earlier session that Bruce pretty much convinced me of the salience of idealism as a metaphysical perspective through his work on quantum mechanics. And he has, I think, argued very persuasively that quantum mechanics can really only be made sense of if we assume that the fundamental thing that exists is mental. And Bruce, have I got that right? And what is your perspective on idealism and quantum mechanics?

Bruce Gordon:

I think that that's a pretty accurate description of my take on things, yes. In terms of the phenomena of quantum physics itself, I see it as pointing to the fundamentality of mind in the universe. And you can take a bottom-up and a top-down approach to that if you like. A bottom-up approach looks at the experimental phenomena in the laboratory, and the mathematical description, quantum physical description of them and attempts to discern what it entails. And one thing we can say about quantum mechanics is that it is in a very fundamental way, irreducibly probabilistic in its description of the world. And by irreducible, I mean, that the probabilities cannot be eliminated by the addition of further information. It's not a kind of improbability that emerges from our ignorance of what's actually going on of the probability that you might associate with say, a coin flip or something like that.

And described in classical physics, if you knew all of the initial conditions, and environmental conditions, and so on, so forth, telling the deterministic story of classical physics, and the amount of force supplied in the flipping of the coin in the air, and so on, so forth, you could, in your complete knowledge of that, say what the result would be. And so the fact that we assign probabilities to coin flips is merely an artifact of our ignorance in a certain... Of the complete physical picture. But in quantum mechanics, there is no completeness to the physical picture that would allow us to eliminate its probabilistic character. There is a fundamental, if you like, incompleteness to the reality undergirding quantum mechanics that requires us to describe it probabilistically, and irreducibly, so that's one aspect of things. And of course, this manifests itself in a variety of ways. One of the peculiarities of quantum mechanics, of course, is non-local phenomena.

If we think of things in causal terms in physics, that is limited by the relativistic structure of space-time, which is to say any sort of causal signal of a physical sort transmitted by the transfer of energy or whatever between aspects of a physical system or two physical systems is subject to the limiting velocity of the speed of light. So if it happens faster than light, it cannot be an energy transfer of any sort, that's

precluded by relativity. Yet in quantum mechanics, we have non-locally correlated aspects of physical systems in which something happening on one side of the universe can instantaneously affect something on the other side of the universe in terms of a non-local, this would be one way of describing it, collapse of the wave function. Wave function collapses then non-local decoherence produced by the interaction of probability waves such that there's destructive interference, and they cancel out in reality appears stable and definite. So those sorts of things point to the, at a very fundamental level, immaterial quality of causality across non-local distances.

And of course, one thing that we would want to say about that is, and also about the irreducibly probabilistic nature of quantum description, is that that's not, and cannot be the bottom level of the story. It points to the incompleteness of the physical world as we experience it, but it begs a deeper explanation because if we go back to our earlier discussion in another session, we can't say that these things happen for no reason at all, and that all we've got here is random devices in harmony that happen to exhibit correlated properties without any sort of explanation of why they're correlated. There has to be a deeper explanation of the correlation. And as we've pointed out, there can't be a physical explanation subject to the limiting constraints of relativity theory for that correlation. So this takes us back, of course, to a principle of sufficient reason as grounding reality. And if there's not a material explanation for something, there has to be an immaterial explanation for it that transcends the physical world.

Michael Egnor:

I think your discussion of the probabilistic nature of quantum mechanics is very compelling, and I think that does lead us into more of an idealistic or mental understanding of quantum mechanics. But is that interpretation that you're providing only a part of the Copenhagen interpretation of quantum mechanics, for example, would super determinism solve the problems that probabilistic characteristics of quantum mechanics raise, or would Bohmian pilot wave ideas solve that problem?

Bruce Gordon:

Okay, well, the Bohmian interpretation is interesting. It privileges the positional representation in the quantum mechanical description of things, and suggests that there is a quantum mechanical pilot wave in the background that enables a full description of the situation such that at least everything always has a position. Well, one of the difficulties with the Bohmian picture is it doesn't extend well into the context of field theory. It doesn't predict the, as standard quantum mechanics does, existence of antimatter, it still involves a kind of occult pilot wave that doesn't involve energy transfer. But just apart from observation allows you to say where these things are located. And of course, once you extend the picture into field theory, all of these merits of having a location, and so on disappear, and the measurement problem becomes unresolved again. So I am not a fan of Bohmian mechanics.

I think it is interesting, and by all means go ahead and work on it and see if you can get somewhere, but I think it's fundamentally flawed, and doesn't capture the nature of things in a basic way, and is likely to lead us to the final picture of how things are. And what's more, we can still say in Bohmian mechanics that observation causes the collapse if you like, to definiteness. And even though we can say in Bohmian mechanics, in the non-relativistic case, at least, that everything has a location. Still, when we go to take a measurement, the result is probabilistic. It has to reproduce the results of standard quantum mechanics. And reality is still staging a performance for our benefit. We don't know what it is in, and of itself except Bohmian mechanics allows us to assert certain things about it in the non-relativistic case in a kind of gratuitous structure that is invoked simply for the purpose of are being able to say that these things have position.

Michael Egnor:

Sure. How about actually how Everett's many-worlds hypothesis, does that get us out of the probabilistic fix that we're in?

Bruce Gordon:

No, it still needs to account for the fact that we... Well, here, let me put it this way. It suggests that every time there's a quantum result, reality splits. So that, for instance, if we had three possible results associated with a quantum measurement, that all three of those results in fact happen, they just happen in parallel realities. And reality splits, and we split along with it so that we are experiencing each outcome in a different reality. And so there's this bifurcation of an incredible and countable number of possibilities from the beginning of the universe up to now, and on into the future with even more branching arms of this universal wave function that describes all of the outcomes, and any given reality is a one path in the universal superposition that constitutes every possibility. So what Everett interpretation is saying, if we take it in a naturalistic context, let me specify that, is that everything that can happen physically speaking, quantum mechanically does happen. And those things that are inconsistent with each other, of course take place in different realities. But everything that can happen does happen.

And of course, one of the worries with that, although there are perhaps some ways of dealing with it in Bayesian decision theory, and various other things as David Wallace has explored, is that it would seem that if everything is guaranteed to happen, then how do we make a distinction among the different realities? Because everything happens with sphere probability one, whence the quantum mechanical probabilities then? And then, of course, there's the question of which basis are we going to describe reality in quantum mechanically? And it tends to lend an error of unreality to the whole thing.

Michael Egnor:

Well, and does it even make sense to describe probabilistic behavior across different realities? How can realities connect?

Bruce Gordon:

That's a probability. And I mean the jury is out whether it's ultimately resolvable or not, and some valiant attempts are being made in that direction that are of a more epistemic nature. And so one of the things I would say though is that one can kind of absorb an ever-ready in picture within a theistic metaphysic, if you like. And in that context, the universal way functions simply becomes an expression of divine omniscience about the possibilities inherent in creation. So that God knows everything that has happened or in the past could have happened. And he knows what is happening, and how we got here, historically speaking. And he knows all of the possibilities, physically speaking, in the future of the universe as well. And all of this knowledge is possessed in a complete and exhaustive understanding of the wave function as an expression of God's omniscience about the universe.

Michael Egnor:

Wow, that sort of middle knowledge, that's Molina's-

Bruce Gordon:

I don't know that it's middle knowledge. Middle knowledge would say that God knows what would happen counterfactually in cases that were never realized. And if we get to cases that are never realized, there are more quantum mechanical possibilities inherent there than just one.

Michael Egnor:

Yeah, sure.

Bruce Gordon:

And so God knows what the possibilities are, but in order for him to know which one is chosen, I would say one needs an eternalist metaphysic in the background. And of course, you get that with the Wheeler-DeWitt equation, which is kind of the analog of the Schrödinger equation in quantum cosmology. So if you take the Wheeler-Dewitt equation seriously, we've got all of these histories of the universe in superposition with each other that constitute God's exhaustive knowledge of things.

Michael Egnor:

Wow.

Bruce Gordon:

And from that perspective, given that this is an epistemic thing in the mind of God, we could say that, "Okay, God knows what the possibilities are, and he sees the choices that are made that he then uses to communicate intersubjectively a common world to all of us, and a unique history to the universe, and a unique future to the universe." And in that case, seeing as all of these things aren't actually happening, the only one that's actualized is the one that God actualizes for our experience, and we hold our experience in common, then we can still make sense of the quantum mechanical probabilities in that context. And we can see this as a broader expression of divine omnipotence. And if you like a God's-eye view of the creation of the information that constitutes the history, and future of the universe, and locally constitutes our experience of the world.

Michael Egnor:

What is particularly beautiful, I think in the way of looking at things that you're describing is it shows the explanatory power of bringing God into the scientific picture that without God, all these theories seem like sort of scattered somewhat unrelated ideas. But when you bring the notion that there is a divine mind that oversees all of reality, it makes things make sense in a much more coherent way.

Bruce Gordon:

I agree. And of course, I think that that was the reason that science got started in the West in the first instance, was that the universe was regarded as the product of a mind. And because it was such, it was intelligible to the human mind, which was created in the image of that divine mind.

Michael Egnor:

Sure. How do you feel about superdeterminism? John Bell proposed that as a metaphysical perspective, and Sabine Hossenfelder has spoken about it a lot lately. Does that get us out of the probabilistic problems?

Bruce Gordon:

Well, as far as I would understand it would be something that is articulated either in a Bohmian model, which we've just discounted, and that would be probably the leaning of John Bell. And I'm not sure where Sabine Hossenfelder's coming at it from. She might be coming at it from the standpoint of Everettian mechanics, and the deterministic evolution of the Wheeler-DeWitt equation that understood as the equation that one solves to get the universal equation. So in such a case, yeah, there's a deterministic development in which everything that can happen does happen in some segment of reality. And this gives rise to the interpretive problems that I was indicating earlier about the probabilities ,and so on, and so forth. Because yes, it is deterministic. Everything is guaranteed to happen, whereas if you appropriate that picture of things in the context of it being an epistemic tool in divine hands, so to speak, you still have the probabilities because only one of those realities is the one that emerges.

So I'm not sympathetic to super determinism because I think the models that give rise to it. And so far, as I'm understanding it at this point, and I haven't done a lot of thought or given a lot of thought to what is being called superdeterminism these days. But if it's in the context of those two models, I see them as naturalistically problematic. Beyond this, of course, I see them as problematic with regard to questions of moral responsibility on the part of human beings, and personal identity, particularly if you've got branching versions of your mind that experience different realities. And we can talk more about that if you would like, but that's just my off-the-cuff sort of initial response to your question.

Michael Egnor:

Sure, sure. How does free will fit into all of this? Because obviously that has a great bearing on moral responsibility. Are you a compatibilist? Do you believe that determinism of any sort can be true, and we can still have free will or is free will necessarily libertarian or don't we have free will at all?

Bruce Gordon:

I would not be a compatibilist. I would not be a determinist. I would be an incompatibilist, which essentially amounts to a form of libertarianism. So in other words, I think that in order for us to be morally responsible for the choices that we make, those choices can't be determined, and for them not to be determined, it must be the case that we could have done otherwise, and we were in control of the choice that we made. And you can tease out the difference, and the necessity of those two criteria by various philosophical thought experiments. But yeah, you need to have been able to have done otherwise, and you need to be in control.

Michael Egnor:

Well, here's an interesting question. St. Thomas, I think, struggled with a definition of free will. In fact, he's sort of notoriously a little vague on free will. Not that he didn't believe in it, in the sense that we do, and obviously he believed in moral responsibility, but he didn't necessarily believe in it in terms of that we had the ability to do other than what we do. And I think the reason he didn't believe in it that way is that he felt that in heaven, when we have the beatific vision, we don't have an option to sin or to do other than what we would do in God's presence, but we are still free and God himself is free. Does that mean that he has the option to sin, and just choose as not to for the time being?

Bruce Gordon:

No, I would say that God's freedom is constrained by his nature, and that as a being that is intrinsically, and essentially, and necessarily good, that sin is not an option for God.

Michael Egnor:

Would you say that that meant that he wasn't free?

Bruce Gordon:

No. He's free within the constraints of the divine nature.

Michael Egnor:

Kind of the euthyphro dilemma of sorts?

Bruce Gordon:

Well, I mean, the euthyphro dilemma deals with questions of is it good because God says so or does God say so because it's good, which is more fundamental, and the resolution of that, of course, is to take goodness into the very nature of God. So standards not independent of him and his commands, if you like, are consistent then are not arbitrary, they're consistent with his nature. So I don't see the euthyphro dilemma as an irresolvable tension. If you're a divine command theorist, I think there are ways of dealing with it for handling.

Michael Egnor:

Right. Well, it's absolutely fascinating stuff. One more quick question that has fascinated me since I was a young man, and I read that, it really isn't clear that there is more than one electron that you can't distinguish electrons. So maybe-

Bruce Gordon:

You must have been reading John Wheeler.

Michael Egnor:

Yes. And that fascinates me. Would you say it is quite true that you can't really prove that there's more than one of them and that they're indistinguishable?

Bruce Gordon:

Well, I think that one needs to kind of cut the Gordian knot on that, and say there are no electrons. There is nothing that is substantial that we would say is an electron. Rather, there are various phenomena that we associate with electrons that display certain phenomenological characteristics. And I mean this in a way can get back to something I didn't discuss, the Heigerfelt-Malament non-localizability of single quanta or single particles in the quantum mechanical description of the world. If you bring relativity theory into the picture, and you ask that a single electron not be able to be in more than one location at once, and that it not be able to serve as an inexhaustible reservoir of energy, such that one could power the energy needs of the United States on a single electron from here to all eternity, then once you've introduced those, and a couple of other minor technical restrictions into the picture, you can say that that electron is not located. It follows from the quantum mechanical rules, and descriptions that that electron is not located in any bounded region of space, no matter how large.

So in other words, it's not present anywhere in the universe. So that's just another roundabout way of saying it doesn't exist as a physical entity in our experiential reality. So the solution is not that there's only one electron, but there are none.

Michael Egnor:

Right, right, right, right. And, again, I'm fascinated how idealism takes this very bizarre reality that quantum mechanics is revealing to us and makes it make sense. It brings it into focus, and makes it something that kind of makes sense.

Bruce Gordon:

I certainly feel that way about it.

Michael Egnor:

Well, it has been my pleasure, and privilege to have this discussion with Bruce Gordon. And so thank you so much, Bruce. And thanks to all of our audience for listening to Mind Matters News. This is Mike Egnor. Thank you.

Announcer:

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