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COMMENTARY

The mind–body problem and social science: Motivating a quantum social theory

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Abstract

This comment addresses some of the critiques of "Quantum Mind and Social Science" by the other contributors, with special reference to the challenge that the mind-body problem poses to conventional, classical thinking about social science. A quantum social ontology transcends those challenges, and in the process could transform social scientific thinking across the board. As an example the essay concludes with a consideration of the physics of social structure.

KEYWORDS

physics of social structure, quantum consciousness, quantum decision theory

Quantum Mind and Social Science (*QMASS*)[1] elicits mixed reactions, though what 'mixed' means depends on context. There are mixed reviews at the individual level, where someone likes some parts of a book but not others, and so has a mixed opinion overall. To my knowledge *QMASS* has not received too many reviews like that, though Douglas Porpora's in this forum and another, equally thoughtful discussion by Patrick Jackson elsewhere,[2] are good examples. Instead, its reviews are mixed at the aggregate level, where some readers like the book a great deal, and others dislike it in equal measure. Given *QMASS*' sensational yet highly speculative claims this split is to be expected, and should make for more fun reading than a typical book forum. But it does complicate the task of responding to my critics.

Going forward, for example, it would be most interesting to exploit constructive comments and interpretations that would further develop my argument. In this respect I could hardly ask for a better (much less generous) review than Steve Fuller's, which highlights an important implication of *QMASS*' argument that except obliquely in reference to free will, I had barely thought of. Namely, a quantum ontology can ground a genuine notion of *possibility*, of how things could truly be otherwise, that the deterministic classical ontology cannot do. That matters partly because it's truer to our experience. It may not feel like it, but no matter how dire the situation, it is possibility, and therefore

the need for choice, that we face at every moment of our lives – right down to how we face our certain death. And possibility could also matter politically, since people taught to think that the world can be different than it is are probably more likely to make it so than those schooled in deterministic fatalism. On both counts, Fuller's point provides one answer to Matthew Donald's question about what would change under the quantum model of the brain – namely, our experience of possibility would make sense, and thus could be cultivated rather than ignored or denied.

Especially as a political scientist, it is tempting to explore at length Fuller's opening into the politics of quantum social ontology and (undoubtedly) epistemology. However, unless I want to mostly give up the chance to respond to my critics, I would quickly hit a very classical constraint: our editor's word limit. So while the politics of quantum social science is now very much on my agenda, for the time being I'm reluctantly going to set aside my favorite review in this forum, and hope someone else picks up the ball where Fuller and I left it.

I am going to do something similar with Vicki Kirby's, also mostly positive review. Unlike Fuller, Kirby has been writing for a number of years in a quantum (if mostly "New Materialist") register, a fact which I'm embarrassed to say I did not know. By the end of writing *QMASS* I thought its map of the bibliographic terrain, at least on the quantum side, was pretty thorough, but apparently I missed a pretty big hill... But in reading the introduction that Kirby helpfully provides here to her work, the resonances of/with my work are obvious, especially in our shared holographic pictures of reality. However, there is one point from which I would dissent, which is her reading of me as a human exceptionalist. To my mind quantum panpsychism points exactly the other way, toward an essential continuity between humanity and not just other life, but reality itself at the fundamental level.

That said, Kirby's concluding question is an important one, about what to do with mistakes, prejudice, and all the other nonsense people get up to. This matters because in *QMASS* I suggested (p. 173) that in contrast to the clashing atomistic billiard balls of classical mechanics, quantum forces are holistic and thus essentially "cooperative," which means the baseline for social theory should not be the Hobbesian state of nature, which makes conflict the norm and cooperation the exception, but just the opposite. Kirby reminds us that quantum holism isn't a magic wand with which we can wave conflict away, nor does it make sustaining cooperation any less urgent as a political project. But here's a riff on her question that she might enjoy: could part of the reason that there is so much conflict be that, after centuries of inculcation, there is too much classical thinking in (and about) social life? Either way, I look forward to reading more work by this fellow traveler soon.

Having given up the chance to exploit some of the more enthusiastic comments on *QMASS*, I at least now have room to maneuver against the more critical ones, which are all by "Old" Materialists. Donald and Daniel Little's broad and dogmatic reviews beg crucial questions and as such naturally deserve special attention.... Porpora's narrower and more open-minded engagement is ultimately skeptical too, but in ways that may help clarify key issues and thus be especially productive down the road. However, before jumping in, I want to prepare the ground a bit, since in my experience (repeated here) the depth of the challenge that the mind–body problem – and specifically the hard problem of consciousness – poses to classical social science is often not appreciated. Reiterating why it is the most important (or perhaps "first") problem of social science[3] will help clarify why I would knowingly make such a speculative and (frankly) risky argument.

1 | SOCIAL SCIENCE AND THE MIND–BODY PROBLEM

Social life presupposes an inner life – let's call it a mind[4] – because it involves taking an Other's perspective to anticipate their actions and adjust one's own accordingly. But what are these

minds? Obviously in part they are brains, immensely complex material objects that move our bodies in response to environmental stimuli. But our minds are more than just neural circuits. Robots and zombies have neural circuits too, but while their behavior might look social, I doubt many of us would call it social. That's because they don't have a subjective perspective on the world, much less on others' perspectives. What robots and zombies lack – though they could never know what they're missing – is the best thing about being a brain, which is the *experience* of it, or consciousness. It is only when we are conscious that we can take an Other's perspective and thus be social at all (cf. sleeping), not to mention taking the perspective of the literally millions of Others encompassed by an institution like the state – which has no material existence as such at all, but only a shared fictive one in many minds. In short, almost everything social scientists study presupposes consciousness. And yet *as* social scientists we tend to take that fact for granted, as no more interesting than the fact that we breathe air, and so consciousness rarely appears explicitly in our work at all.

The premise of *QMASS* is that mainstream thinking about the mind–body problem has come to the point where it is necessary to think very hard about whether this long neglect of consciousness in social science is still tenable. The Modern Scientific Worldview ("MSW") is supposed to provide us with an authoritative ontology, an empirically well-founded account of what there is (and isn't) in the world around us. And the problem is that, after centuries of hard work, the orthodox, classical materialist version of MSW's ontology has found *no trace* ***even of a place*** for consciousness, much less consciousness itself.

Let's be clear how deep this ignorance truly is. It's not like we just haven't discovered what causes cancer. Cancer we have no reason to doubt exists; it is a material object that we can see and touch, and causal effects we can trace. Consciousness is not only unobservable, but doesn't feel material either. As such, there seems to be no scientific reason to expect it to exist at all, any more than ghosts do. So if this object (sic) we call "society" depends for its supposed existence on consciousness, then society too should not exist. And in that case, what exactly are social scientists – much less everyone else – even doing?! Hence the question that ultimately animates *QMASS*, and the mind–body literature more generally, is really a transcendental one: how is consciousness possible in the first place?[5]

For a problem as fundamental as the mind–body problem to persist so long, it seems like something must be wrong with the MSW, but what? And does the whole thing have to go, or would tweaking it be enough? For present purposes the relevant parts of the MSW's ontology consist of two commitments (both of which, it should be noted, I share – though with a twist).

The first commitment is to monism, the belief that ultimately there is only one reality, not multiple ones. For most scholars and scientists today that takes dualism (at least in its ontological form) out of serious contention, since its whole thesis is that Mind and Body are irreducibly different realities. To be sure, dualism still has thoughtful advocates, not least because monists have failed to solve the problem. But my personal view is that dualism is both an acceptance of failure and aesthetically unappealing, and so should only be embraced if all monist strategies demonstrably do not succeed.

The MSW's other metaphysical commitment is to physicalism, the belief that ultimately reality is 100% physical. What precisely that means is the crux of the issue, but there is at least consensus that 'physical' should be defined by reference to what physics tells us about reality. More specifically, physicalism assumes that everything in the world – including consciousness – is subject to the laws or "causal closure" of physics, or "CCP" (see pp. 7–11). That takes God out of the mind–body debate, and out of social science too (where all sides are "methodological atheists"),[6] but the CCP's significance is wider than that. Even though human beings are far removed in

scale from sub-atomic particles, our bodies are made up of them, and as such social scientific laws cannot violate the laws governing *particle* behavior – the laws of physics – without ceasing to be scientific theories altogether.

However as I show in *QMASS*, the content and constraints of the CCP, and therefore of physical*ism*, differ dramatically depending on whether the laws of physics in question are classical or quantum – on whether we are talking about the CC***C***P or the CC***Q***P. In philosophy of physics the CC***Q***P is taken for granted because everyone knows that the hard, material objects of classical physics break down at the quantum level into wave functions, the nature of which is unclear but it is definitely not classical. But in philosophy of mind and also the social sciences, when scholars opine about "physical" reality, they almost always ignore the quantum option and take the classical one for granted instead.

Little, for example, defines physicalism as the view that consciousness is a function of the Central Nervous System. Well, *no*. (Understood in a non-trivial sense) this makes two assumptions that a ***Q***-physicalist does not have to accept: that consciousness is solely a macroscopic level phenomenon; and that its explanation will be found at that level too. I grant that there are principled, decoherence-related reasons to favor classical assumptions ex ante, but these are contested by quantum consciousness theorists on physicalist grounds. In other words, because there are two physics there are really two physicalisms, one of which has a natural place for consciousness (in the collapse of the wave function), and one of which does not. So Little's framing of the problem, in which 'physical' means 'classical' and 'material,' is actually an *interpretation* of physicalism and as such begs the central question from the start.

2 | BUT WHY SHOULD SOCIAL SCIENTISTS CARE?

The importance of the mind–body problem, and the threat it poses to contemporary understandings of our work, is easily lost on social scientists (or at least it long was on me). Partly it's just training; with so much else to do in graduate school there's little time to worry about the nature of consciousness. But there's also a substantive argument for social scientists to ignore it, made by Donald and Little here and by Jackson as well.[7] Namely, regardless of the knots that philosophers can get themselves into, we all *know* that people are conscious. So why can't social scientists just take that knowledge as given, and get on with explaining/understanding human behavior, like we always have? Even Donald – a physicist – thinks that if you need to consult a physics textbook to know that love is real, then you've just never been in love!

Philosophers' confusion probably won't cause most social scientists to stop doing what they do, but there are three reasons it should give us pause.

2.1 | Reason #1: If Consciousness is an Illusion, Then No Social Science

Despite Foucauldian bells and statistical whistles, in the end most social scientists rely heavily on folk psychology: on ancient, pre-scientific concepts or "mechanisms" like beliefs, desires, intentions, choices, passions, etc., all of which refer to intentional and thus in principle conscious states. We do this for an obvious reason: because it works. Folk psychology enabled human beings to create enduring societies long before social scientists came along to make them better. So if consciousness is actually an illusion, or "ghost in the machine," then that would not only call into question how most social scientists do their work, but also make a complete puzzle of human society.

Most people will find illusionism about consciousness deeply counter-intuitive if not downright silly; whatever its cause, consciousness seems to be clearly a fact ("I think therefore I am..."). Yet this is increasingly what leading materialist philosophers themselves have concluded from their failure to solve the mind–body problem.[8] (Of course, they might have concluded more plausibly that *materialism* is the illusion, but one can nonetheless admire a willingness to fall on their ontological sword). To be sure, many materialists are not yet ready to bite the illusionist bullet, and still entertain hope that concepts like 'supervenience' or 'emergence' will save the day. But after a century emergentism has failed to convince even most materialists, who argue (speaking of Little's "conjurer's move") that the term is just shorthand for "...and then a miracle happens" and thus not really an explanation at all. So with no new explanations on the horizon, Illusionism has captured materialists' imagination (sic). That love of Donald's might not be "real" love after all....

So now imagine that social scientists take seriously the belief of eminent materialist philosophers that consciousness (and for good measure, free will too) is an illusion. Where does that leave folk psychology, and what kind of social science can be done without it? It seems to me, nowhere, and not much.

It may be useful to think about the challenge of Illusionism by distinguishing illusions from fictions, with which social scientists work routinely. A majority would probably say that, ontologically speaking, the objects we study – political parties, states, markets, and so on – are not *really* objects, out there in the external world, but only "as if" or fictional objects in our minds. Usually, this deflationary ontology – Instrumentalism, but in this context 'Fictionalism' might be better – is challenged by Realists, according to whom, if mental fictions are acted upon then they can create social objects with ontological status of their own. States are not just "as if" persons, but "real" ones, and so on.[9]

Illusionism challenges Fictionalism from the opposite direction. While I have not seen it defended in the literature, Fictionalists should agree that, even if the state, per se, is a fiction, it must exist in at least one, more limited, sense, as an intentional object inside people's minds. And that's important because like other folk psychological concepts, it can then serve as a basis for mental causation, motivating people to act in certain ways and thereby anchoring the causal claims one needs to do social science.[10]

Illusionism explodes this logic. Its claim is not (against Realism) that social objects supposedly out there in the external world are actually fictions, but that our experience of such objects *in our own minds* is fictional (illusory). Setting aside its counter-intuitiveness, the consequences of adopting such an ontology in social science would be dire. If not just the state, but our very ideas about the state are a fiction, then how can people act upon those ideas? And with mental causation out the window, can social causation be far behind? Indeed, while they may seem innocuous to social scientists, from an Illusionist standpoint such quaint folk psychological concerns actually pose a threat of vitalism to social science, because they admit phenomena into our work that have no more place there than entelechies in biology, or for that matter, the Devil. So all this talk of consciousness and intentional objects has to go, and be replaced with real, objective data, from fMRIs of our insides correlated with pure (purged of all intentional [i.e. illusory] content) behavior on the outside. Carried to its logical conclusion – eliminative materialism and behaviorism – that is what a real social science would be.

It may be objected that I'm pinning too much here on Illusionism, which is so bizarre as to give all materialists a bad name. However, I am not aware of any positive explanation for consciousness that even most materialists would accept – and presumably few would resort to a desperate negative expedient if they thought anyone had a better idea. So in Illusionism it seems we

reach the apotheosis of the materialist research program on consciousness. For isn't rejecting the reality of your object of study to save your theory not only the ultimate degenerating problem shift in the Lakatosian sense, but an almost religious leap of faith? Be that as it may, while we might save materialism with such a tactic, discarding folk psychology would kill social science.

2.2 | Reason #2: The Emperor Has No Clothes

The most rigorous (sic) theories and methods in social science – like game theory and Bayesian statistics – are thoroughly classical in structure and thus implicitly materialist in their ontology. Upon first encountering the mind–body problem, therefore, social scientists' first instinct will be to hunker-down, while looking over the parapet for help from Donald, Little, Porpora and other materialist philosophers. Reassured by CCCP stalwarts that consciousness will ultimately be explained in classical material terms, social scientists can then get on with their work, confident that (some version of) the classical model of man is an Established Scientific Fact. As such, the burden of proof is squarely on any alternative ontology, quantum or otherwise.

Or at least so the mainstream would have us think, since this again begs the question. Exhibit A is disagreements among materialists about how their approach to consciousness could possibly be true. Why treat materialism as an epistemically privileged Fact when its advocates can't even convince each other? Why not conclude that it's not consciousness which is "wrong," but materialism? It's unclear what would convince materialists of that – of what would make their ontology falsifiable and therefore more than just an article of faith – but my point in this section is not that materialism is wrong. Rather, it's that the challenges it faces are so deep that we have no more reason to think it is *right* than some wild quantum alternative. When it comes to consciousness, the Emperor is just a Passionately Held Opinion, not an Established Scientific Fact.

Honestly facing that ignorance, that at this point we have NO IDEA what consciousness is or where it comes from, is a good standpoint from which to judge classical critiques of *QMASS* (and for social scientists to think about the mind–body problem in general). For it's then not enough to say that because quantum panpsychism seems crazy, the orthodoxy must be true by default. Of course it's crazy! For after all this time, what else is going to solve the hard problem of consciousness (certainly not materialism) – or, for that matter, the problem of interpreting quantum mechanics, the eventual solution to which John Bell argued will surely "astonish us"?

Consider for example Little's point that if quantum brain theory proves to be wrong, then my realist claim that human beings are walking wave functions, and with it my whole social ontology, falls apart. That's true, and like many others, Little thinks that Max Tegmark's calculations proved exactly that over 15 years ago, so end of story. The theory's defenders obviously disagree, but that's not my point here. It's that even if Tegmark is right that brains cannot sustain quantum coherence, how does that in any way vindicate materialism? For isn't it even more clear, after centuries of failure (vs. one set of contested calculations), that consciousness can't possibly have a classical explanation – and so *Little's* system fell apart years ago? The default position here must be ignorance, not a tired orthodoxy whose only new ideas are illusions.

We see a different but related kind of question-begging in Donald's paper, and in particular in his suggestion that for someone "with [his] background," *QMASS*' panpsychist interpretation of quantum theory and claims about non-local interaction in social systems are "simply ridiculous" and "absurd." I will of course defer to his knowledge of quantum theory, but panpsychism has had a following among eminent quantum theorists from the start (Eddington; Pauli; Schrodinger). And after long being sidelined in the subsequent philosophical debate, panpsychist interpretations have been gaining renewed traction lately (look for Harald

Atmanspacher, Michel Bitbol, Shan Gao, Roger Penrose, Hans Primas, Paavo Pylkkanen, Henry Stapp, and now even Professor Tegmark!).[11] As for fanciful claims of non-local social interaction – which many social scientists will tell you are routine – there too I was able to build on (while speculating beyond) extensive work by Diederik Aerts, Peter Bruza, and others developing a quantum approach to language. In short, while Donald may find my arguments absurd, they nonetheless represent the distilled thoughts of any number of quantum theorists of standing.[12]

So where does that leave consciousness in the ontology of the MSW – an illusion (not Donald's view it seems), a mystery to which we will never find the answer, an inconvenient truth to sweep under the rug, or what? Regardless, he exhibits a curious lack of urgency about finding out for someone who has thought hard about these issues for over 25 years.[13] But then again, in his view we don't need consciousness to interpret quantum theory, to secure our humanity, to make us moral, to explain mental causation, or to study social life. Indeed, it's unclear in his view why we *do* need consciousness, but whatever it's for it can't be very important in such a disenchanted world. So if materialists never do succeed in explaining it, well then, so what?

Perhaps that is the universe we live in, even if it doesn't feel like home. But until we have an actual materialist explanation for consciousness rather than just ritual incantations of centuries old articles of faith, there is no reason for social scientists to accept the Emperor's classical model of man if they don't want to.

2.3 | Reason #3: You Can't Avoid the Choice

So what's a young social scientist to do? Well, one answer is nothing at all, and to just carry on with one's research using folk psychological categories. That is a legitimate option because Donald, Jackson, and Little are right that we don't need to solve the mind–body problem to do social science – though I would put it differently. We don't need to *confront* the problem to do social science. We can always ignore it, just as ontological questions can be avoided in quantum physics, where wide-eyed first-year students who ask "but what does it all mean?" are told to "shut up and calculate." But folk psychological concepts are vague, and as intentional phenomena they lack a clear basis in the physical world (the threat of vitalism above). So part of the job of social scientists is to define our concepts more rigorously, and to integrate our work into the larger body of science.

But to do that we need a conceptual grid, a coherent structure of assumptions about the nature of logic, probability, and reality that will enable us to think about and observe social life in a systematic (and hopefully right!) way. Where do such grids come from? From ontologies in part, including assumptions about the nature of the mind and how it relates to the external world. Those ontologies might not themselves be objects of fervent belief, or even very self-conscious; but just working ontological assumptions that, if called to our attention, we would bet or "wager" on so we can continue with our work. Whether just working or not, however, without some ontology we will have no grid; with no grid no perception or methodology; and without those no way to do social science. So while we don't personally have to solve the mind–body problem to do social science, we only get this luxury if we adopt someone else's ontology, at least as a working hypothesis.

Still, that would not in itself be a problem if, as in physics, the grid we are adopting at a particular moment were presented as an option, which we are choosing explicitly for X or Y reason. After all, in physics there are still many situations that classical mechanics would naturally be chosen for analysis. But in the social sciences the classical grid we are given is presented as if it were the only game in town. If you asked social scientists whether they knew that logic itself

and probability too come in two radically different forms, what percentage do you think would say yes? 10? 5? 1? It would almost certainly be the first time many had heard the question.

In accepting the classical worldview upon commencement of our training, therefore, we social scientists adopt a fictional (albeit possibly correct) solution to the mind–body problem, not an actual one. Again, that gets essential jobs done: it gives us a grid with which to conceptualize and measure social objects, methods to analyze their behavior, and generally to do useful work untroubled by philosophers' concerns. The problem, of course, comes if we are making the wrong wager. *If* consciousness is actually quantum (and I would say the jury is still out on that), then using a classical grid for social science would be a rare but truly historic Type II error (rejecting a true theory as false). And it would touch everyone, not just positivists, who are explicit (and sometimes indeed fervent) in their classical worldview. Because for all their anti-naturalism, interpretivists too cannot dispense with logic and some notion of probability, and (as far as I can tell) they have almost all at least implicitly chosen a classical one as well. The danger, in short, of making the wrong ontological bet is that we produce an apparently scientific yet systematically distorted picture of social reality across the board.

Moreover, in addition to this epistemic risk, applying a classical grid to a quantum reality could also negatively affect social life itself. For insofar as the classical worldview of society percolates down to how we teach our children – and it has had 300+ years to do so – then from the beginning in socialization we are in effect trying to create ("discipline"?) classical out of quantum beings. As I suggested above in connection to Fuller, that would be unfortunate – even tragic – at a global level if it reduced our creativity and capacity to cooperate in times of crisis. And likewise at the individual level, where producing classically rational actors means repressing the socially entangled, free and vital beings that we truly are in favor of an alienated, deterministic, and mechanical simulacrum. Sounds like a recipe for mass neurosis to me....

Be that as it may, how should social scientists think about choosing between such different grids, or ontologies, given that we need some grid to even think? It's little comfort that in principle the choice is a false one because quantum mechanics subsumes classical at the limit. Most social scientists will still have to choose, since agnosticism is not an option in practice. You can think what you want in your head, but when you sit down to write a paper, you generally either have to use quantum tools or classical ones. The only question is whether or not you choose consciously, and on what basis.

So is there some principled, as opposed to sociological, basis upon which to make such a choice? Well if by that we mean an epistemic principle[14] that would tell us which perspective is more likely to be true, then in my view at this stage the answer is no. One implication of acknowledging honestly our fundamental ignorance about the nature of consciousness is recognizing that there is no compelling, non-question begging argument favoring either social ontology. I'm personally confident that quantum panpsychism is the way to go, but *QMASS* comes down in the end to an aesthetic judgment ("too elegant not to be true"), and we know what they say about beauty... So Donald, Little, and Porpora could be right. Until we know much more about the brain we will remain in the domain of intuition, judgment, and sheer play, not rational theory choice.

That gives a "beauty contest" (and indeed, sociological/political) quality to the question for now, but at least it would be progress to see it *as* a beauty contest, rather than as an Established Scientific Fact that the human mind is a classical machine. And it would also be progress to see the question as one on which social scientists cannot avoid taking a stance in their work – and so in the spirit of all things academic, would do well to consider explicitly.

3 | SELECTED PROBLEMS IN QUANTUM SOCIAL ONTOLOGY

That's all I can say right now about why social scientists should care about the mind–body problem. Even if we can get away with ignoring it in practice, I don't see why we should want to if answers (one way or the other) to deep and long-standing questions about our work might be at hand. So let me turn now to three more specific challenges that our Old Materialists have posed to my social ontology, which will hopefully subsume some others as well.

3.1 | The Meaning of Quantum Decision Theory

Donald and Little think it very damaging to my case that quantum decision theorists – whose work I argue provides the strongest evidence to date for quantum brain and consciousness theory, and thus ultimately a quantum social science – do not make such inferential leaps themselves. Not that the leaps are necessarily wrong – their stance is usually agnostic rather than antagonistic – but in their work it is clear they do not want to be associated with such claims, much less even wilder ones like panpsychism and quantum vitalism. So if the experts so clearly disavow speculative appropriations of their work like mine, Donald and Little suggest, then surely that says a lot....

Or does it? In fact, this criticism again begs crucial questions.

First, remember that it is perfectly legitimate – indeed, routine – when using quantum theory to be agnostic about its actual physical basis; after all, physicists themselves do it all the time ("shut up and calculate..."). Although the "under-determination of metaphysics by quantum physics" is a headache for philosophers, it gives everyone else the freedom to use the formalism as a heuristic for purposes that have no obvious connection to sub-atomic particles at all.[15] Thus, the fact that quantum decision theorists bracket ontological questions arising from their work is per se unremarkable and unproblematic.

Second, let's say that Donald and Little concede that point on a technicality. They might then respond in a more sociological vein, "still, isn't it suspicious that, when given the opportunity, quantum decision theorists so consistently dissociate themselves from ideas like mine? Doesn't *that* tell us something about their plausibility?" Well, again, *no*. For once we enter the sociology of knowledge very different, non-epistemic considerations come into play – and in the case of quantum decision theorists two in particular.

One is that these people are as hard core as scientists can be – primarily physicists and mathematical psychologists. Most probably have little interest in metaphysics, and even if they do, (based on observations of my physicist brother over the years) they are inclined both by temperament and training to stick closely to the facts, avoiding wild speculation above all. These individual level factors are probably then reinforced by a more structural one, which is the struggle that quantum decision theorists faced early on getting their work published. I know from conversations with several that their papers were put through (let's call it) "exceptionally rigorous" vetting by editors, who were both skeptical on the merits about such dramatic findings, and no doubt worried too about being seen as strengthening the quantum consciousness heresy. (This resistance belies Donald's comment that "of course" the quantum formalism can be used fruitfully to model human behavior; initially, no one else thought so). In such a hostile environment it's not surprising that quantum decision theorists would avoid taking any more controversial positions than necessary. This is not to suggest that they secretly agree with me and are merely

engaging in strategic self-censorship. In fact, most of them probably are either still genuinely agnostic, skeptical, or just don't care. But it does reinforce my previous point that the lack of public endorsements of quantum brain and/or consciousness theory is not evidence that such ideas are being rejected.

Third – and now I want to go on offense – just because quantum decision theorists have not yet addressed some of the larger, realist questions that their work raises does not make those questions disappear. So imagine that in 25 years, propelled by continuing experimental successes, quantum decision theory has become the new orthodoxy, subsuming expected-utility theory as a sometimes interesting limit case. The question would then be: does the success of the quantum model of the mind at the behavioral level tell us anything about the mind itself? Today we don't know for sure, since at least in theory it might be possible to reconcile quantum-like behavior with classical brains. But this is inelegant and counter-intuitive.

For despite Donald and Little's blasé attitude toward the empirical successes of quantum decision theory in explaining Kahneman-Tversky type anomalies,[16] I suspect neither they nor I nor *anyone* would have expected such a thing even just a few years ago (and journal editors apparently held the line as long as possible!). After all, the natural expectation – which social scientists have assumed all along – is that classical brains would produce classical behavior. So if we are observing quantum-like behavior instead, then that is surprising and demands an explanation. So does Little really think these findings are irrelevant to quantum brain theory? Imagine the counterfactual, that human behavior clearly followed classical predictions. My guess is that even though it's only behavioral, he would tout this as evidence (as he should) against quantum brain theory (and thus for classical). But then why wouldn't similar rules apply in reverse? The question of whether quantum theory is relevant to psychology was first raised by Bohr over 80 years ago, yet it took almost 70 to get seriously asked. Why so long, and why such resistance, if we expected this all along? I don't know, but as the behavioral evidence mounts, the question of whether it's because we have quantum brains will become harder and harder to ignore.

Of course, even if quantum decision theory is eventually seen as evidence for quantum brain theory that still wouldn't prove *consciousness* is quantum. That's because from a materialist standpoint – even a quantum one, like the Many Worlds Interpretation Little favors – there is no more reason to expect quantum brains to be conscious than classical ones. So the metaphysical leap to panpsychism plays a key and separate role in my ontology. But because in the collapse of the wave function quantum theory has space within the formalism itself for phenomena that seem inexplicable in material terms, quantum brain theory at least enables quantum consciousness theory, and the behavioral successes of quantum decision theory are exactly what it would predict. In sum, I would draw no conclusions at all from the reluctance of quantum decision theorists to endorse quantum brain (or consciousness) theory at this time. In the end they or their descendants will come around.

3.2 | The Problem of Biological Quantum Coherence

We have seen that one place Donald and Little attack *QMASS* is at the bridge it tries to build between behavioral evidence (quantum decision theory) and the metaphysics of consciousness. In-between behavior and metaphysics, however, are many purely scientific questions about the body, the crucial one of which here is whether any biological systems – much less complex ones like our brains – are physically capable of sustaining quantum coherence. If they can, then that would be crucial evidence for *QMASS*' claim that people *really are* walking wave functions, and support its conclusion that a realistic social science *must* begin with a quantum framework or

misrepresent social reality from the start. If on the other hand even simple organisms cannot sustain coherence, then it is likely that humans can't either. In that case, we are just the complex classical computers the orthodoxy always said we were, and so social scientists don't have to change a thing (except perhaps accept that our experience is all an illusion!). So a lot rides on the issue of biological quantum coherence, not just for *QMASS* but for the social sciences as a whole, so we should be grateful to Donald and Little especially for highlighting it.

Unfortunately for us non-biologists, this is a question of straight biological science, and one that we might not get a clear answer to for some time. Or at least that is the strong impression I get from a (pro-quantum) review article like "The Principle of Coherence in Multi-Level Brain Information Processing," published in 2013 in Progress in Biophysics and Molecular Biology.[17] This article has two takeaways for me as a social scientist. First, despite the authors' evident sympathies, they are clear that neuroscientists know far too little about the brain for anyone to conclude confidently that quantum coherence there *is* possible. We *just* don't know. Donald and Little are right that, on the physical/scientific side (much less its metaphysical one), the argument of *QMASS* is based on a conjecture, and in light of the decoherence problem, a highly speculative one at that. However, and second, it's equally clear from the article – and its 400+ references[18] – that the question of biological quantum coherence is a very active, very serious, and very inter-disciplinary field of scientific research. The work is being published in major journals and by major presses, and in my anecdotal impression has been expanding rapidly in the five years since 2013. So the upshot is the same but now with the opposite valence: "neuroscientists know far too little about the brain for anyone to conclude confidently that quantum coherence there is *not* possible. We just *don't* know." Donald and Little are therefore wrong to conclude, not agnostically, but decisively against the coherence hypothesis, to the point of ridiculing it.[19] Either they are going well beyond the evidence themselves, or simply begging the question.

Still, accepting this critique might be cold comfort for social scientists, who are left waiting on biologists and neuroscientists to answer the very first question of our inquiry – namely how to think (classical or quantum) about our inquiry at all. Perhaps, but in the meantime I think there are still two valuable lessons to be learned here. One is that even if the principals in the biological debate think of it in scientific terms, for those of us in the bleachers, watching it at third hand, it is useful to think about what we are seeing as more like a legal contest. By that I mean that, because the truth is not yet known, when doing my "case studies" on the debate about coherence in Chapter Five, or when Donald and Little invoke particular articles in their essays here, it is important to remember that we are all doing so for essentially rhetorical purposes, and that none of us is any position to take strong epistemic positions (except agnosticism) on the actual science.

In light of this legalistic framing it is instructive to look at Donald and Little's strategy for prosecuting (and ultimately extirpating?) the heresy of biological coherence – and to do so in historical perspective. For in 2018 any such prosecution faces in the jury a problem at least of atmospherics, which stems from the emergence of quantum biology as a scientific discipline and specifically the discovery that plants, birds, and several other organisms make non-trivial use of quantum processes. As I read this literature, it has not yet proven that even simple organisms can sustain quantum coherence over time, so there is no immediate threat to the classical model of man. But these discoveries certainly hint strongly to that effect, and many more scientists are now heading into this territory. Thus, the independent emergence of quantum biology has given renewed impetus to a central claim of quantum brain theory going back to Herbert Fröhlich's pioneering work on coherence in 1968 – and in so doing puts classical skeptics more on the defensive than they are used to.

Donald and Little both acknowledge quantum biology, but then something curious happens, especially in Little's paper. Rather than seeing it as a potentially revolutionary, paradigm-changing scientific development (as many of its practitioners do), he concludes with a yawn – if birds use quantum effects, then that "doesn't seem like an enormously surprising result."[20] That kind of discounting plays an important rhetorical function in his presentation, because minimizing our post facto surprise will dampen ex ante expectations for any earth-shattering revelations in the future, which prepares the jury psychologically for the coup de grace in Little's closing remarks: that whatever (relatively uninteresting...) quantum effects there are in the biological realm, undoubtedly they stop short of quantum coherence.

Neat as it is, however, this in effect rewrites history, since less than 25 years ago, prominent neuroscientists were confident and categorical in stating that "there is absolutely no indication that quantum mechanics plays any significant role in biology."[21] Indeed, despite (again) having been suggested by Bohr, and occasional articles and books in subsequent decades, within biology itself the idea of quantum biology seems to have been a fringe, even taboo, topic until perhaps 2000.[22] So actually, the confirmation that plants and organisms exploit non-trivial quantum processes in nature is very, VERY surprising indeed. That's why it made headlines, after all, and I bet it would have surprised a younger Donald and Little as well!

Having now reset our expectations or "priors" post facto, the first question that naturally comes up is, if plants and birds can perform the amazing and unexpected feat of exploiting quantum processes in nature, then isn't it reasonable to suppose that humans – the most evolved creatures on the planet – should be able to do so too (in vision, for example)? And from there it is natural to ask the $64,000 question, whether we should expect full-blown biological quantum coherence as well? If members of the jury think quantum biology is really no big deal, then so be it. But if they believe quantum biology might augur a paradigm shift, then I would expect them to be more optimistic that coherence – and downstream, quantum brain theory – will be confirmed.

So when it comes to the unresolved debate about biological quantum coherence, the question for social scientists – and as I argued earlier, we can't avoid the question in practice – comes down to which side of history you think classical and quantum biology are on. Until more science is in, each one of us will have to place that bet for ourselves.

3.3 | The Physics of Social Structure

Porpora's essay is more addressed to *QMASS*' sociological implications than the others, and it is also more narrowly focused (looking primarily at Chapter 13), which gives us the opportunity to drill deeper and hopefully make progress on specific questions. He frames his interest in terms of the agent-structure problem, emergence, and the place of extra-discursive reality in my ontology. As I see it, these concerns all tap into the same basic issue: the relationship between physics and the physical on the one hand and social structures (not consciousness this time) on the other. So to save space let me try to address at least most of his worries – and some of the other contributors' – within that singular frame of reference.[23]

Everything turns on what we mean by 'physical' and 'physicalism' in relation to the causal closure of physics, or CCP. Porpora points out (correctly) that my use of the term 'physicalism' is heterodox, which is confusing enough; but he then argues that the confusion is compounded by inconsistencies in my text (p. 8 vs. p. 257). However, when read against the background of my larger argument, in my view these passages are not inconsistent (even if they could have been phrased more self-consciously to avoid misunderstanding), and as we'll see, my definition of 'physicalism'

is actually truer to its "real" meaning. What is going on here, I think, is not that Porpora completely rejects my social ontology, or that he has completely misunderstood it – but rather that his reconstruction of my argument misses some key points. That's partly on the clarity of my prose, however, so let me try to sharpen how these definitional issues relate to my overall thesis. In doing so I hope to show how some of the ways in which Porpora describes his own ontology are confusing as a result, and that perhaps there is less distance between us than his paper suggests.

Physicalism as I take it is the view that our *meta*physics should defer to our *physics*, and specifically the causal closure of physics (CCP). The central definitional contribution (if I may) of *QMASS*, and the tip of the wedge that I'm driving into the orthodoxy's lines, is that physicalism is usually understood unthinkingly in classical terms, which begs crucial questions. Here's my argument in a nutshell:

1. there are two versions of the "CCP" – the CC***C***P and CC***Q***P – and thus of physicalism (**C**- and **Q**-physicalism), which have different "physical" properties and potentialities;
2. the CC***C***P implies a materialist metaphysics of tiny material objects within which no trace of consciousness exists; in that classical world it is correct to say, with Porpora, that 'physicalism' is the contemporary form of philosophical 'materialism';
3. under the CC***Q***P, however, those tiny material objects dissolve into ghostly wave functions, and there is ontological space for mind at the fundamental level; in that world, there is no necessary connection between deference to physics (physicalism in the strict sense) and materialism, since the physics itself can be read in anti-materialist, panpsychist terms.;
4. Failure to recognize these distinctions, and in particular identifying the CCP implicitly with a classical materialist ontology begs the whole question of whether quantum theory is necessary to make sense of human action;

After working hard (and I think charitably) to read between my lines, Porpora gets most if not all of this argument. However, he fails to carry it consistently through and so we end up in a muddle, talking past each other.

I am referring in particular to his two-part suggestion that a) I am more materialist than he because I am (also?) an avowed physicalist, whereas b) he is a materialist but not a physicalist. As we've seen, the "because" in (a) only follows in **C**-physicalism, not **Q**-physicalism, since panpsychism is perfectly at home in the latter. All materialists are physicalists, in other words, but not all physicalists are materialists. So (a) is out. As for (b), that he is a materialist but not a physicalist, I'm trying to get it, but frankly I just don't. Porpora says he does "not think that hermeneutical meaning or anything that derives from it are in any way physical."[24] Is he then rejecting the CCP altogether? And if meanings and other intentional objects are not "in any way" physical (classical *or* quantum), then what (or where) are they? Unless angels or devils are an option, the only other answer I see is ontological dualism. Yet I would be surprised if Porpora, an historical materialist of long standing, saw himself as a dualist. In short, on this one I have to punt, pending clarification from Porpora – but that doesn't mean we can't still do some other useful work right now.

Specifically, and relating directly to the mind-matter relationship, Porpora argues that the extra-discursive aspects of social structures – by which he means (what I assume he would call) "material" phenomena like "inequality, power, conflicts of interest, competition, and the like [e.g. from my own field of IR, war]"[25] – lie beyond my approach. That mystifies and worries me in equal measure, since with a sub-title like "Unifying Physical and Social Ontology," if *QMASS* cannot accommodate extra-discursive phenomena then clearly I have failed in my central aim!

In responding to this serious charge I first want to park the example of demographic structure, since we seem to disagree about whether it is a fully social structure at all and thus can stand in for the larger debate – and space is running short. Instead let me address less debatable cases like the social structures that generate capitalism, the state, or international system. These have the added advantage that on Porpora's view they should be harder cases for my argument, because considerations like inequality, power, and violence play central roles in sustaining them. So, to what extent are such structures actually extra-discursive, and is that aspect of their being necessarily outside a quantum social theory?

The answer is very little and no. If 'extra-discursive' means "has no intentional content," then it is difficult to see how *any* structure that human beings have ever devised to govern their interactions – not just nice ones in a home but horrible ones in war – could be not fundamentally and essentially mind-dependent. I tried to show this early in *QMASS* for the case of the state, a social structure which will be invisible to orbiting ETs if they can't read our minds, and which will "disappear" if its citizens stop believing in it (the USSR in 1991). But perhaps as an example the state is still too warm and fuzzy (I do liken it to a rainbow, after all), so let's take a seemingly stronger case of extra-discursivity: the ontology of war. Where and what is war, for example the Syrian civil war?

Well, like all social action it takes place in particular (classical) space–time coordinates; it takes people to fight it; and many of those people need to engage in the characteristic behavior of war, which is trying in an organized fashion to kill other people. All of these are purely material phenomena that could be observed and recorded by orbiting ETs without knowing anything at all about the content of our minds. And yet even these most extra-discursive aspects of war only make sense as being partly constitutive of a *particular* war, like the Syrian civil war, if we bring in discourse, which for present purposes we may define as shared intentional content.

Consider first the people who fight in wars. Which ones count as being "in" that particular war, as opposed to the nearby war in Iraq or guerrilla war in Turkey? ETs won't be able to tell, since the fighters mostly look the same and in a spatial sense are all fighting nearby. The only way to distinguish who is in each war[26] is by reference to the citizenship and/or objectives of their combatants, but those are intentional phenomena. Now take space–time coordinates. Although ETs could see that the fighting is concentrated in a certain region, the boundaries of 'Syria' vs. 'Iraq' – and thus the specific spaces for control over which people are fighting (and beyond which it might not spill) – only exist as intentional objects in people's minds. Temporal coordinates might seem more thoroughly extra-discursive. However, as I argue in Chapter 10, what social scientists call "time" has a subjective aspect,[27] and putting boundaries around events too has intentional content. Even accepting the orthodox or New York Times view of the Syrian civil war as a free standing event, when *exactly* did it begin? And what if we take the heterodox view of some of the fighters themselves, and construe the fighting as simply the latest round of a 1000 year war between Shia and Sunni Muslims? From that (very discursive!) standpoint, the "Syrian civil war" began before Syria even existed.

Finally let's talk about the ultimate extra-discursive aspect of war, killing, or removing of people from discourse altogether. Even so, who gets killed, how, when, and why – are all shot through (no pun intended) with intentional content. First there is identifying which people are at war (and thus potential targets) vs. neutral parties; then among those at war, identifying who is friend, enemy, or merely rival (and thus potential ally); then agreeing on what everyone is fighting about; how individual fighters are constituted into groups; what rules there are for limiting violence; and on and on and on.

In short, war is all about discourse, not in the sense that it has no extra-discursive aspects whatsoever (life and death see to that), but in the sense that it is hard to say anything at all about what is going on without reference to the mostly shared contents of people's minds (discourse). So even if it were true that *QMASS* cannot handle purely material, extra-discursive phenomena (more in a moment), in my view the domain of such phenomena in human society is much, much smaller than Porpora makes it out to be, and in most respects is of only marginal interest per se. What makes war "war" is overwhelmingly its intentional rather than extra-discursive content, and of course *QMASS*' basic proposal is that all intentional phenomena are quantum. So I don't see social structure as posing any problem at all for quantum social theory, and if anything, the latter's radical holism substantially strengthens the case for the strongly relational view of structure that Porpora and I have both long favored.

But as a final question to *QMASS*' view of social structure, even if it constitutes only a truncated, "rump" materialism, how does the classical mind-*in*dependent world of bodies, bullets, and space–time relate to the quantum social world? Porpora sees my quantum model of man in almost idealist terms, as completely cut off from material reality, and in one sense I can see why. Each and every one of us is a unique bubble or monad of experience, and because life depends on protecting quantum coherence, an impenetrable bubble at that – to penetrate our bubble is to kill it/us. Never mind that we do not have a classical explanation for any experience at all; by conjuring up the movie "Boy in the Bubble," my approach naturally raises the question of how minds or subjectivity relate to the world beyond our biological boundaries without being instantly atomized by environmental decoherence.

However, while the details are surely formidable and still mostly unknown, my answer here I think is easy. If the findings of quantum biology hold up and keep growing, then it is likely our minds hook onto the world in the same way that the minds of all organisms do, down to the very simplest: through quantum mechanisms like entanglement, non-local causation, tunneling, and so on. In the human case these mechanisms are centered on vision, from which (apart from language) we get most of our information about the external world, but many organisms can't see, so quantum processes are presumably present in all senses.[28] Again, if plants and birds can relate to the world quantum mechanically, then it seems very unlikely that people would have lost such a precious ability over the course of our evolutionary ascent.

4 | CONCLUSION

Little concludes his critique of *QMASS* with an old-fashioned appeal to authority: "And really – this is just not a plausible theory in my assessment" (p. 14). To which one can only reply "says who?" An orthodoxy that concludes from its own explanatory failure that consciousness is an illusion? Or, if it's not an illusion, then where is the materialist solution to the problem that, in Little's assessment, is "more plausible" not just than a quantum one but other, competing materialist ones? As far as I can tell, there is no epistemic authority around here at all, just anarchy and daunting burdens of proof on all sides.

Moreover, in this light it is particularly hard to see why it seems so important to destroy the quantum heresy, rather than welcome it – with a "good luck" and perhaps knowing smile – and its potential contribution to a surprisingly intractable problem. There seems to be far more concern in this literature with avoiding a Type I error (accepting a false theory as true) than a Type II, but that only makes sense if we have a secure base from which our knowledge can grow. The

historic failure of a classical materialist approach to make any progress on solving the hard problem of consciousness shows, at the very least, that we do not have such a base.

A quote widely attributed to Schopenhauer[29] captures what I hope we're seeing in these and other initial responses to the first appearance of systematic quantum ideas in the social sciences: "All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident." If my experience here is any kind of microcosm – and compared to most existing work in quantum social science, *QMASS* is a hard sell due to its insistence on a realist vv. "as if" approach – we seem to be mostly beyond Stage One. For that I have especially Donald and Little to thank, who spent what must have felt like too many hours of their ever-shortening lives reading and writing about a book the central thesis of which they found utterly incredible. That's definitely progress, though in the larger scheme of things getting past Stage One is probably the easy part. Stage Two will and should be much tougher, and has hardly even begun in the social sciences. But the generous reactions of Fuller, Kirby, and even Porpora – each in their own way on the road already past Stage Two – are grounds for optimism. Regardless, the question of whether consciousness is a classical or quantum phenomenon is of fundamental importance for the proper analysis of society, and it does not yet have an answer. Stay tuned.

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ENDNOTES

[1] Unless otherwise noted, all page and chapter references in the text below are to Wendt (2015).

[2] See Jackson (2016).

[3] Steve Smith, and through him the late Martin Hollis, led me to this view.

[4] Although I think all organisms have minds of a sort, I'll limit myself here to the easy, human case.

[5] Cf. Bhaskar (1979), which does not thematize consciousness per se.

[6] See Porpora (2006) for a provocative take on this issue.

[7] See Jackson (2016).

[8] See Seager (2017) for a root and branch critique of illusionism.

[9] See Wendt (2004) and commentaries in the same issue.

[10] See (2015: 26–28) for further discussion.

[11] Much of it cited in footnote 18 on p. 113.

[12] This, of course, does not make them right. See Filk (2015) for a review of *QMASS* by a quantum theorist who seems to find the argument perfectly sensible.

[13] See Donald (1990), which predates even Penrose and Hameroff's agenda-setting work.

[14] There is also the possibility of using a purely normative principle to choose under such profound ignorance. I would welcome others' thoughts on that.

[15] This is known as "weak" or "generalized" quantum theory; see p. 5.

[16] Which admittedly can be read more skeptically than I did in *QMASS*; for an excellent deflationary account see Waldner (2017) – who nonetheless thinks quantum decision theory could be a game changer in the social sciences.

[17] See Plankar, Brezan, and Jerman (2013); also see Al-Khalili and McFadden (2014), and Engel (2014).

[18] Note that this is in an article about coherence in the brain, not organisms in general, where the references are probably by now countless.

[19] Their confidence seems particularly unwarranted given that neither deals with a single mechanism that proponents have proposed as ways organisms might deal with the decoherence problem; it's pure argument by assertion.

[20] Little, p. 9.

[21] Hopfield (1994: 53).

[22] The first major mainstream book of which I am aware is Abbott, Davies, and Pati, eds. (2008).

[23] The main one that I shall leave aside is the nature of emergence in a flat ontology, since here Porpora relies on Nancy Cartwright's work, which on this issue is ultimately classical, and since he does not address the quantum emergence literature himself I would not have much more to say at this point than I do on pp. 255–66.

[24] Porpora, p. 4.

[25] Porpora, p. 7.

[26] And even this will be quite imperfect, given the trans-national aspect of these particular conflicts.

[27] This is because we are usually more interested in the A-series than the B-series of time; see pp. 126–130.

[28] See Turvey (2015) for an impressive synthesis of two decades thinking about the intersection between ecological psychology and quantum theory, where vision plays a central part.

[29] A website called Quote Investigator finds that there is no "matching adage" in any of his work, which I would not have learned but for the research assistance of Quinn Riley.

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