A CRITICISM OF NONREDUCTIVE PHYSICALISM

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Introduction

Why Theological Anthropology is Important

Anthropology - the way humans view themselves - is basic to many human endeavors, from social, to theological, to political. According to Sowell,

> The capacities and limitations of man are implicitly seen in radically different terms by those whose explicit philosophical, political, or social theories are built on different visions [of the nature of man]. Man's moral and mental natures are seen so differently that their respective concepts of knowledge and of institutions necessarily differ as well. Social causation itself is conceived differently, both as to mechanics and results. Time and its ancillary phenomena - traditions, contracts, economic speculation, for example - are also viewed quite differently in theories based on different visions...The ramifications of these conflicting visions extend into economic, judicial, military, philosophical, and political decisions.[1] (brackets mine)

The post-enlightenment scientific era has brought about a habit of mind, called *physicalism*, which sees everything as a product of physical processes. This stems from the fact that physical investigation has been extremely fruitful in expanding the description of nearly every aspect of life, and from the fact that science has developed a methodology and notation which allows it to be very specific about the nature of supposed causes and effects, and therefore deal with them rationally. This is in opposition to *dualism*, which finds the physicalist view of reality incomplete, and usually posits the existence of an immaterial soul to make up the difference. Mainstream post-enlightenment dualists have generally been content to leave the operations of the soul as a mystery, and therefore beyond rational analysis. One result of such a position is

[1] Thomas Sowell, *A Conflict of Visions: Ideological Origins of Political Struggles* (New York: Quill, 1987), 10.

obvious - very little advancement has occurred in understanding the soul, even while very much advancement has occurred in understanding physics.

The first aim of this paper is to describe a set of phenomena I will call "nonphysical phenomena," because they defy physical understanding *categorically*. By this I mean that they are phenomena which we not only don't currently understand, but which are unamenable to physical description and reasoning, but amenable to other sorts of terminology and reasoning which are contrary to the mode of description that physics employs. For physics to appropriately capture it, it would have to employ modes of reasoning that would not be recognizable to us as physics. The second aim of this paper is to suggest a framework for the investigation of such "non-physical" phenomena. While "non-physical" types of causation may always be mysterious in some sense of the word, there is no reason that they should not be included in formal representations. I will give some suggestions for how such phenomena might be represented and reasoned about, but more important is my insistence that such representations ought to be investigated. The final aim of this paper is to show why this is important to theological and ethical understandings of the world.

Nancey Murphy has been one of the primary advocates for physicalism in Christianity. As such, she has a very well-developed notion of what physicalism is, what it means, and how it might be reconciled with Christian theology. She has written numerous papers and books clarifying what she calls a *nonreductive* physicalist perspective and its implications. Therefore, rather than attempt to survey every notion of physicalism available, this paper will concentrate on interacting with her development of physicalism.

The term *nonreductive physicalism* that Murphy uses to describe her position responds to the common charge that physicalist understandings of the person are necessarily reductionistic - that is, they reduce a person to mere jumblings of atoms, and deny that many of the higher-level patterns of thought are as real as the physics behind them. Murphy argues that physicalism is not necessarily equivalent to this kind of reductionism, and instead offers an account of physicalism which attempts to give full weight to higher-level patterns of thought. She employs the concepts of emergence to explain how higher-level and lower-level phenomena can mutually interrelate without degrading either level of description. However, my argument for this paper is that despite having the "nonreductive" adjective attached, they "physicalism" part of Murphys anthropology keeps it more reductive than Murphy would like to admit, and keeps the "emergent" part from emerging very far. It paints a picture of life that is inconsistent with daily reality.

I should make it clear from the beginning that my own beliefs about theological anthropology is very nebulous. I tend to think in dualistic terms mostly because of the scientific age that we are in. Since *physics* is the main framework of reference in society today, it is also the starting point for my own thinking. However, since I believe that physics is incomplete as a description, I place myself in the dualist camp, thinking that there is more than just physics interacting with us. There may in fact be more divisions to reality than I assume; or, it may be that reality is monistic, but in a way radically different from the limited way in which our current notions of "the physical" entail.

In any case, my arguments, while they work as arguments for dualism, the more important point is that physics is an insufficient explanation for the phenomena of normal human activity. An ontological reality that goes beyond physical description is needed to understand our basic day-to-day experiences.

The importance of this is, as pointed out by Sowell above, that decisions on every level of life is based on the ways that we think of ourselves, even if those ways of thinking are implicitly assumed rather than explicitly considered. I think that, at least in America, the potential social problems which may result from societal-wide physicalist thinking have largely been avoided because even those who are physicalists tend to use dualistic modes of thinking habitually. However, I think that such thinking across generations will lead to problems because of incorrect assumptions about ourselves. As Niebuhr tells,

> ...man as the spectator and manager of history imagines himself to be freer of the drama he beholds than he really is; and man as the creature of history is too simply reduced to the status of a creature of nature, and all of his contacts to the ultimate are destroyed.[2]

A Short History of Christian Anthropology

As Murphy points out, histories of anthropology are rather hard to come by.[3] She herself provides one, and I'll be drawing primarily on her account in this section.

Early Christian anthropology tended to be aspective rather than partitive - the Biblical writers tended to be concerned with *aspects* of the whole person, rather than with chopping a person into distinct, separable parts.[4] The resurrection emphasis (both

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[2] Reinhold Niebuhr, *The Irony of American History* (The University of Chicago Press, 2008, reprinted from 1952), 88.
[3] Nancey Murphy, "Scientific Perspectives on Christian Anthropology," *CTI Reflections* 8 (2006), 84.
[4] Murphy, "Scientific Perspectives," 85.

for Jesus and for our future hope of resurrection) was on physical resurrection,[5] though it should be noted that 1 Corinthians 15 describes a marked distinction between our present physical bodies and our future physical bodies, which may limit how far such a view can be taken.

Later, after Christianity had been exposed to a variety of outside ideas from Neoplatonic and similar sources, the concept of an immaterial soul as a distinct entity began to materialize. In a compromise between platonic and Christian thought during late antiquity and the early Middle Ages, the soul became distinct and immortal, and it would be re-united with a body at the time of resurrection.[6] In the High Middle Ages, Thomas Aquinas, following Aristotle, softened the dualism present from previous centuries.[7]

The rise of post-enlightenment science led to the rise of viewing the natural world as a machine. As the view of the world became more deterministic, the concept of the soul was used by Descartes and others to make room for non-mechanistic aspects of humanity.[8] In recent times, however, the existence of an immaterial soul has been contested by many Christian theologians. Such arguments have arisen from a conglomeration of factors. First, there has been a shift in Biblical studies away from platonic notions of immortal souls back to the bodily conception of resurrection.[9] Second, the success of the sciences in explaining reality has led to dramatic shifts in our thinking in many areas. The success of physics has led to a shift in the

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[5] Murphy, “Scientific Perspectives,” 85.
[6] Murphy, “Scientific Perspective,” 85.
[7] Murphy, “Scientific Perspectives,” 85.
[8] Murphy, “Scientific Perspectives,” 85.
[9] Murphy, “Scientific Perspectives,” 86.

understanding of the universe as a whole.[10] The success of evolutionary biology has led many to a shift in understanding life on earth. Humans are now seen on a continuum with animals, with physical processes entirely accounting for their differences.[11] Finally, the success of the neurosciences in explaining behavior that had been previously attributed to the soul has led many to conclude that the soul is an outdated concept.[12]

When physical anthropologies first appeared, many denied the existence of what most cultures have traditionally considered to be uniquely human traits. These early physicalists insisted that human behavior was entirely explainable in terms of physics and chemistry. That is, any thought, emotion, or sensation had an exact equivalent physical event in the brain. This is known as a reductive physicalism because it reduced all human endeavors to terms of correspondence to physical events in the brain.[13] However, a new type of physicalism has been gaining importance, and that is nonreductive physicalism. The "nonreductive" part of nonreductive physicalism claims that there is a divide between "ontological reductionism," which states that there is no need to propose new metaphysical entities as one moves up the complexity ladder, and "atomistic reductionism," which holds that only the things at the bottom of the complexity ladder are "really real".[14] In addition, since human brains are wired to function symbolically, their higher-level operations can be considered just as "really real" as the

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[10] Murphy, "Scientific Perspectives," 86.
[11] Murphy, "Scientific Perspectives," 87.
[12] Murphy, "Scientific Perspectives," 88.
[13] Nancey Murphy, "Human Nature: Historical, Scientific, and Religious Issues," in Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature, ed. Nancey Murphy, Warren S. Brown, and H. N. Maloney (Fortress Press, 1998), 10-11.
[14] Warren S. Brown and Nencey Murphy, *Did My Neurons Make Me Do It - Philosophical & Neurobiological Perspectives on Moral Responsibility & Free Will* (Oxford University Press, 2009), 47-48.

lower-level physical events that they are composed of.[15] Therefore, nonreductive physicalism is ontologically reductionistic (there are no extra metaphysical entities), but not atomistic (the lowest level of the hierarchy is not the only one that is "really real").

Therefore, according to nonreductive physicalism, the brain processes with forethought not because it has a soul which reaches outside itself, but rather because the brain's symbolic representation of reality allows it to externalize itself and situations.[16] Therefore, while the actions of the brain are attributed entirely to low-level physical phenomena, they are fully understandable only if higher-level ideas such as meaning and purpose are included. The difference between the low-level brain phenomena and higher-level purposes can be analogized to a computer program - all of a computer's functioning can be entirely evaluated in terms of electrical signals running through wires. However, an understanding of the overall patterns that govern this functioning is only achieved by understanding the higher-level meaning of what those signals are intended to achieve.

Nancey Murphy and Nonreductive Physicalism in Christian Cosmology

Nancey Murphy is well-recognized as a leader in the modern dialogues between religion and science. Her contributions include constructing a unified epistemological framework for scientific and theological thinking, showing the influence of reformed theology on modern science, demonstrating how the integration of science and theology can contribute to understanding ethics, and understanding God's actions from within a scientific view of nature.[17]

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[15] Murphy, "Human Nature," 11.
[16] Brown and Murphy, *Neurons*, 251.
[17] George Ellis, "Nancey Murphy's Work," *Zygon* 34, no. 4 (1999), 602-605.

One question which Murphy repeatedly tackles in the intersection between science and theology is the question of who we are as beings created by God. Murphy has adopted nonreductive physicalism as her foundational anthropology for a combination of scientific and theological reasons. Her work in this area has focused on giving an account of why nonreductive physicalism is preferable to other anthropologies, and how a physicalist can make sense of theological claims about humans, including the notions of mental causation, free will, religious experience, and moral responsibility.

I see nonreductive physicalism as greatly preferable to reductive accounts of anthropology, yet, as will be shown, physicalism, including nonreductive physicalism, is still not expansive enough to account for the realities of human life, including creativity, consciousness, and choice.[18]

Core Ideas in Nonreductive Physicalism

Physicalism

Nonreductive physicalism, like all varieties of phyiscalism, assumes that physics is causally closed.[19] That means that there is no element of ordinary reality that requires any entities which would not be a part of physics.[20] However, for this to make sense, one must first deal with what it means for something to be a part of physics. The notion of "physics" must be specific enough to make a determination of whether one

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[18] While I speak of the "realities of human life" I am not making the claim that these apply *only* to humans, but rather that they apply *at least* to humans.

[19] Brown and Murphy, *Neurons*, 48; Brown and Murphy, *Neurons*, 79. Exceptions are made for God's action, but those are beside the point for the general questions of anthropology. The one place where this does affect anthropology is in the human's communion with God. For Murphy this is a real interaction with God guiding the quantum events in our brain as part of that communion. Since this paper is not considering communion with God specifically for the phenomenon we are considering in this paper Murphy's anthropology can be considered to be entirely within the causal closure of physics. The only exception being in the discussion on choice, where, as will be shown, Murphy's exception actually makes the problem worse for physicalism.

[20] Again, with an exception for God's own actions.

action or another is a part of physics, but not overly specific, such that the continual learning of new physical laws won't necessitate a continual revision of the definition.

Prior to the advent of quantum theory, physicalism would mean that, given a certain starting state of the universe, and a perfect knowledge of the physical laws, one could predict with certainty all events in the future by applying the physical laws iteratively throughout time. That is, given a starting state, the laws of physics imply a single possibility for each future state. In mathematical terms, the laws of physics could be considered an equation, s1 = f(s0), where s0 is the state of the universe at a given time, f() is the laws of physics, and s1 is the next instantaneous state of the universe. Prior to quantum theory, physicalism would state that for every s0 there would be only one valid value of s1, which would be in theory calculable (though, because of the number of variables, practically incalculable).

In quantum theory, however, the laws of physics imply multiple possible result states from applying the laws of physics to a given state of the universe. Therefore, the equation would instead be S1 = f(s0), where S1 is a set of possible values for s1, and, again, is in theory calculable. Most formulations of quantum theory suggest that the actual s1 which results is based on the application of a random chooser, which we will denote as r().[21] Therefore, we could rewrite the equation as s1 = r(f(s0)) to denote that the laws of physics imply a set of values, from which one is chosen at random.

Therefore, in physicalist anthropologies, no part of nature acts outside of the causal structure of physics outlined above. Murphy does allow, however, for God, since

[21] It should be noted that r() is *not* a pure function. A pure function is one in which the inputs to the function uniquely define the outputs. r() is not a pure function, because, given the same set of world-states, it could choose any of them as a result. Given the same set multiple times, it can give different results each time. However, f() actually is a pure function, since it gives sets of possible configurations.

God is not a "part" of nature, to manipulate the random chooser, r(), as a means of influencing quantum brain events in people.[22]

The reason why this discussion of the nature of physics is important is that it is important to show what is and is not included in mainstream physics. No one believes that we know every law of physics, but the expectation of mainstream physics is that physical laws will lead to a range of possible physical states. The mechanism for attaining physical states is specifically random. If the mechanism for choosing among physical states was an element *within* the function f() (as the "hidden variables" interpretation of quantum mechanics would imply), then this would simply mean we haven't found all of the laws. If the mechanism for choosing among physical states were an entity outside the function f() (other than God), then that would mean that ontological reductionism, and therefore physicalism, was false.

It is also important to note that nonreductive physicalism doesn't try to import a spiritual metaphysic onto physics. Murphy has emphasized that "physicalism" is preferential to "monism" precisely because physicalism rules out the possibility that the core principles are unlike the core components of physics.[23] Murphy states,

> Among scholars who consider the relations between theology and science a common term is "emergent monism." I prefer "nonreductive physicalism" because, while "monism" is a proper contrasting term for "dualism," it means that humans are composed of only one *kind* of substance, but does not tell us whether that substance is physical or something else.[24]

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[22] Murphy, "Cognitive Science and the Evolution of Religion: A Philosophical and Theological Appraisal," in *The Believing Primate: Scientific, Philosophical, and Theological Reflections on the Origin of Religion*, ed. J. Schloss and M. J. Murray (Oxford University Press, 2009), 275; Nancey Murphy, "Science, Divine Action, and the ID Movement," in *Intelligent Design: William A. Dembski and Michael Ruse in Dialogue*, ed. R. B. Stewart (Fortress Press, 2007),163.
[23] Nancey Murphy, "Nonreductive Physicalism," in *In Search of the Soul? Four Views*, ed. J. Green and S. Palmer (Intervarsity Press, 2005), 116.
[24] Murphy, "Nonreductive Physicalism," 116.

For instance, nonreductive physicalism would be opposed to the idea that the core ontological reduction might be to a monistic spirituality, where physics is an epiphenomenon of that. For example, in Henry's monism, the universe is not physics, but rather mental experience.[25] Nonreductive physicalism would be contrary to such a view.

One may wonder how this differs from the materialist view of the person. In short, it doesn't. For Murphy, the difference between physicalism and materialism rests entirely on one's view of God, not on the person. As Murphy says, "'Materialism' has been used to refer to a theory of human nature, but also to a worldview or metaphysical system. In the latter case, this involved (in addition) the denial of the existence of God or any other kind of nonmaterial being."[26] Murphy finds no objection to the material view of the person, provided one does not also rule out the possibility that God exists and interacts with creation. In fact Murphy states that she has no problems with what she terms as "ontological reductionism," which is the thesis that there are no new forces at work when one moves up the causal chain from atoms to humans.[27] Murphy instead simply wants to avoid "atomistic reductionism," which is the thesis that the lowest levels of the causal chain are the only pieces that are fundamental and truly real.[28]

Emergence and Reductionism

The other key component of nonreductive physicalism is the "nonreductive" component. If one takes physicalism for granted, an easy step many people make is to then say that because physics defines the totality of reality, then only things with a direct

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[25] Richard Conn Henry, "The Mental Universe," *Nature* 436 (2005), 29.
[26] Murphy, "Nonreductive Physicalism," 116.
[27] Murphy, *Neurons*, 47-48.
[28] Murphy, *Neurons*, 48.

correspondence to physical properties are really real. All other entities are merely, at most, useful fictions.

However, it is possible to construct a nonreductionist account of nature within physicalist frameworks. One of the keys for achieving such an account is by making use of the concept of emergence and emergent properties. A system has emergent properties if the whole system has identifiable properties that the individual components of the system do not possess. For example, flight is an emergent property of a jet plane. None of the individual components of a jet possess self-propelled flight, but when all of the pieces are put together, the jet can fly.

There are many ways to divide up emergent properties and emergent theories. One of the most important distinctions is the distinction between strong and weak emergence. Strong emergence says that, in a given system, a set of properties can emerge which are not dependent on the lower-level workings of the parts. Nonreductive physicalism, because it is a physicalist theory, does not propose strong emergence. Weak emergence states that, like the jet example above, systems can display identifiable properties which are not present in the components themselves. Another example would be the concept of "wetness". An individual molecule of water is not "wet". However, large numbers of water molecules all acting together will behave as being "wet".

Within her framework of weak emergence, Murphy presents Terrence Deacon's three orders of emergence as important categories to distinguish within weak emergence in describing an emergent anthropology.[29] First-order emergence is based

[29] Nancey Murphy, "Emergence and Mental Causation", in *The Re-Emergence of Emergence*, ed. P. Davies and P. Clayton (Oxford University Press, 2006), 240.

on scale effects of self-similar aggregates. Our discussion of water is an instance of first-order emergence - increasing the *number* of water molecules changes the gross dynamics of the system.[30] While first-order emergence tends to override local configurations of aggregates (i.e. the behavior of water can be characterized without paying particular attention to the exact configuration of each molecule), second-order emergence is the propagation of small configurational changes which translate into larger-scale effects.[31] These are often termed "chaotic systems," because their outcomes are so dramatically alterable by small changes to initial conditions. While first-order emergent systems can often be described without reference to their history or initial conditions, second-order emergent systems require detailed (often impossibly-detailed) accounts of their history in order to understand them. Deacon notes that the defining attribute of second-order emergent systems is the linking of small- and large-scale phenomena in a "feedforward circle of cause".[32] That is, small perturbations may have effects which get progressively amplified, such that even a minor disturbance of the system may have far-reaching effects.

Third-order emergent systems include a symbolic self-referential component, which links the boundaries of the system. That is, the system has a notion of a closed self, and often of its own components. Deacon gives two examples of third-order emergent systems - memory and evolution. In evolution, DNA is the representative component, which is a symbolic representation of the organism. This symbolic representation can be used (in cellular transcription processes), copied (for cell

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[30] Terrence W. Deacon, "Three Levels of Emergent Phenomena," in *Evolution and Emergence: Systems, Organisms, Persons*, ed. N. Murphy and W. Stoeger (Oxford University Press, 2007), 98.
[31] Deacon, 102.
[32] Deacon, 103.

duplication), and manipulated (by mutation). Likewise, memory includes a representation of the person doing the remembering. Memory can be called forth, written down, and contemplated upon. The self-referential nature of the symbolic component gives a sort of closure to the whole system, because it defines its own space symbolically.[33]

Murphy notes that these higher-level systems do in fact have causal powers of their own, even if they rely entirely on (or "supervenes upon" in emergentist language) their underlying physics for these powers. Therefore, they can be considered just as "really real" as the underlying physics. Since third-order systems such as the brain are self-representing, they provides the ability for the mind to evaluate and consider options about itself.[34]

Free Will

Nonreductive physicalism's approach to the free will problem is a fairly straightforward extension of emergence. Murphy's approach to the free will problem is to separate the concepts of "selection" and "indeterminacy".

For Murphy, free will exists because brains have the emergent ability to represent ideas and possibilities symbolically, analyze them for possible future outcome, and then make a selection from those possibilities for the best course of action. Because this selection occurs based on symbolic information in the brain, the symbolic information and the processing of this selection is just as real as the underlying physics that it runs on.[35] In addition, the symbolic representation of self and others in the brain gives a

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[33] Deacon, 107.
[34] Murphy, "Emergence and Mental Causation," 241.
[35] Murphy, "Emergence and Mental Causation," 238.

physicalist account of choice which does not do injustice to the reasons we normally give for making choices - that is, our choices can indeed based on the rational thinking processes to which we often attribute them, and not on "unconscious manipulation" by non-emergent physical factors.[36]

Murphy largely sidesteps the question of whether or not this selection process is determinant or indeterminate, because she doesn't view it as important to the question of free will. Instead, Murphy views the crux of the free will debate as to being whether or not the whole person has the capacity for distinct, and rational, causal powers. Therefore, because of the emergent causal powers of the brain, Murphy thinks that nonreductive physicalism is compatible with free will.[37]

Biblical Anthropology

Murphy makes two primary points regarding nonreductive physicalism from a Biblical perspective. The first is that the Biblical authors were not attempting to relate a specific anthropology. That is, their discussions of mind and body were always for the purpose of demonstrating some other point - describing the ontology of humanity was never their primary purpose.[38] The second is that the idea of a soul has had problematic consequences for the mission of the gospel, which, for Murphy, is more of a socio-political endeavor than a metaphysical one.[39] For Murphy, the notion of the soul has given the Church something to care about besides continuing Jesus' teachings about how we are to live together in the present world, and therefore has limited the Church's effectiveness.

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[36] Nancey Murphy, "Nonreductive Physicalism: Philosophical Challenges," in *Personal Identity in Theological Perspective*, ed. R. Lints et al. (Eerdmans, 2006), 138.
[37] Murphy, "Nonreductive Physicalism," 138.
[38] Murphy, "Scientific Perspectives," 86.
[39] Murphy, "Scientific Perspectives," 97.

Physicalism, Cartesian Materialism, and the Fuzzy Boundary

While Murphy emphatically asserts physicalism as her anthropology, she also emphatically discounts "Cartesian Materialism". Murphy describes, and then counters, two forms of Cartesian Materialism. In the brain-body dualism form, the "spiritual" side of Cartesian dualism is still maintained separately from the body, but it is physicalized in the brain. That is, it maintains the separation between our "inner" and "outer" selves, and using Cartesian terminology and thought processes for dealing with them - our "inner" selves just happen to be physical entities rather than spiritual entities.[40] Murphy criticizes this view on the basis that the person is a whole body, not just a brain. What happens to our extremities are not external, they are just as much a part of us as the brain is.[41] In addition, the "inner theatre" model for brain function is inappropriate, since conscious brain function is not localized to any specific area of the brain.[42]

The other Cartesian Materialist view is the reductionist materialist view. According to Murphy, this is "a defective view of human beings" that arises "if one begins with Descartes' dualism and simply subtracts the mind."[43] At first glance, this might be mistaken for an expanded monism that goes beyond bare physics. Indeed, on rare occasions, Murphy seems to hint towards this by implying that there are happenings which are simply not derivable from local causes (such a phenomena would, one presumes, violate her notion of a hierarchy of complexity).[44] It is not always clear how to take such statements in terms of the rest of her stance on the nature of

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[40] Brown and Murphy, *Neurons*, 22.
[41] Brown and Murphy, *Neurons*, 23, 27, 32.
[42] Brown and Murphy, *Neurons*, 29.
[43] Brown and Murphy, *Neurons*, 15.
[44] Brown and Murphy, *Neurons*, 51; Brown and Murphy, *Neurons*, 9; Nancey Murphy, *Bodies and Souls, or Spirited Bodies?* (Cambridge University Press, 2006), 129.

physicalism, which is that physics is causally closed, that emergence does not add any new properties or substances, and that free will should be framed in terms which are compatible with determinism.[45]

I think, however, that when Murphy speaks of something not being based on local causes, she should not be taken as implying that there is an exterior cause, no cause, or a strongly emergent force acting on the neurons. Instead, I think, based on the sum total of her work, she should be taken to mean that these are the results of higher-level patterns of organization which work as structuring causes for events.[46] Murphy does allow for some indeterminacy such as quantum indeterminacy, but it is relegated to irrelevance in Murphy's thought on the nature of human action.[47] Murphy does hint at the possibility of there being some modes of indeterminacy apart from simple probabilities, but it is unclear if that is an ontological or epistemological claim (i.e. whether there are different modes of indeterminacy apart from probability or whether the distribution of probabilities are unknowable because of the uniqueness of the occurrence).[48] Again, viewed in the context of the totality of her work, this will be taken as an epistemological claim.[49]

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[45] Brown and Murphy, *Neurons*, 69; Brown and Murphy, *Neurons*, 8; Brown and Murphy, *Neurons*, 273. In the last reference, note particularly that the options Murphy sets up are "deterministic" or "random," both of which are in opposition to libertarian interpretations.
[46] Nancey Murphy, "The Problem of Mental Causation: How Does Reason Get Its Grip on the Brain?" *Science and Christian Belief* 14, no. 2 (2002), 146-152.
[47] Nancey Murphy, "Neuroscience, Determinism, and Downward Causation: Defusing the Free-Will Problem," in *Creation: Law and Probability*, ed. F. Watts (Ashgate, 2008), 130-131.
[48] Brown and Murphy, *Neurons*, 101.
[49] Brown and Murphy, *Neurons*, 47-48 is a pretty emphatic statement against any addition of ontological entities beyond what physics would entail.

Inadequacy of Nonreductive Physicalism

Nonreductive physicalism has gone very far in reconciling physical and mental causation. However, nonreductive physicalism still suffers from several explanatory inadequacies in relating to the world in which we find ourselves in. That is, there are several ways in which a soul or a soul-like explanation is required.

Before diving into the (non-exhaustive) list of phenomena for which physicalism is insufficient, it should be noted that this does not necessarily entail substance dualism, or, in fact, any particular anthropological theory. Instead, it shows the kinds of phenomena which must be appropriately accounted for by any satisfactory anthropology.

The answer may be substance *dualism*, but it could also lie in a trinitarian or quaternarian view of the person. Or, rather than a *substance* dualism, it could be an aspect dualism, as long as it does not restrict causation to physics. Perhaps, as an even more radical idea, the true reality is a monism, but a spiritual monism where physics is merely an epiphenomenon of that greater reality. My main contention is that physicalism lacks the ability to account for the activities that humans regularly engage in. Therefore, pursuit of physicalist anthropologies are both unnecessarily limiting and can in fact be problematic both scientifically and spiritually.

Creative Solutions to Problems - Oracle Machines and Gödel Statements

The first aspect of reality that we are going to cover for which physics is insufficient to cover is creativity. Creativity has long been noted as a fascinating human trait. While modern historicism habitually places all creative actions into a historically-

defined box, the fact is that within every creative act there is something surprising and novel to it, even if there are a thousand things which tie it back to its history.

Physics, though, has no concept of novelty. Physics does, however, have the concepts of determinacy and indeterminacy. The problem, however, is that indeterminacy is not the same thing as novelty. If the mind is ontologically a matter of physics alone, then creativity is a myth. Everything that a person does is either the product of a deterministic mechanism, or an indeterministic variation on that mechanism. Creativity simply disappears in this scenario.

Perhaps there isn't any creativity, and we are only fooling ourselves to think that we have creative powers. Perhaps creativity is a useful concept because we are not yet capable of making a machine as complex as the brain, and therefore "creativity" has more to do with the fact that our brain is so computationally active that we cannot yet model its powers.

To some, it might seem that either this question is either insoluble, or, perhaps, that because of the radical advances in computing technology over the past century, combined with the radical advances in neurobiology, that it is easily solvable in favor of the physicalist notion of creativity (i.e. symbolic computational complexity). In any case, theoretical computer science gives us some tools to address this question directly.

Before we address the question of whether novelty exists in creativity, a bit of background needs to be established on theoretical computer science. In the first half of the twentieth century, before computers existed, Alan Turing devised a system for defining *algorithms* (an algorithm is a step-by-step procedure) for performing mathematical processes. These defined algorithms were known as *Turing Machines*,

which are very analogous to modern computers. A simple way of describing a Turing Machine is to say that they consisted of an infinite read/write memory (in a modern computer, this would be a combination of the computer's RAM and hard drive, although, in practice, these are not infinite), and a fixed table of rules on how to manipulate the memory (in a modern computer, this would be the microprocessor), and a set of values assigned into the computers memory.[50] The "fixed table of rules" could be as simple as imaginable. For example, if you only wanted to perform the identity function, you could have a table of rules which says, "no matter what, halt computation." Then, the value in the memory at the end of the program would be the same as the value in the memory at the beginning. The table of rules can be arbitrarily large or small. However, it must be fixed.

Below is a very simplistic Turing Machine, which uses an infinitely long tape for its memory. If you follow the procedure as written, you will start by reading the digit at the read/write head, giving a value of 1. You then look to see what to do in the state transition table. Since the state is A (see the state register), you would move the read/write head forward and change the state to B. The next value that we would read is a 0. Looking at the state transition table for state B and value 0, it says to move backwards but keep the same state, which is B. The next value we read is a 1. Looking in the

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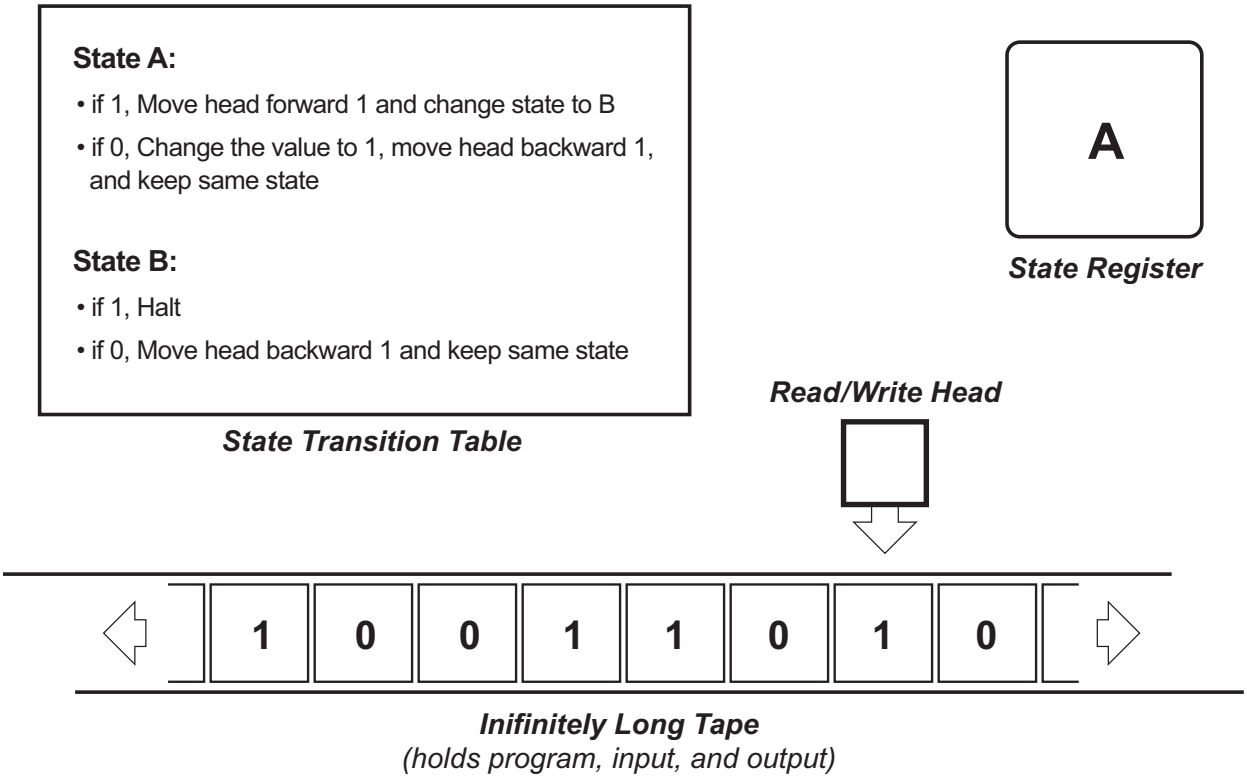
[50] Alan M. Turing, "On computable numbers, with an Application to the Entscheldungsproblem", in *The Undecidable: Basic Papers on Undecidable Propositions, Unsolvable Problems, and Computable Functions*, ed. M. Davis (Raven Press, 1965), 117; It is important to note that while the modern computer is in fact a variant of a Turing machine, when speaking on theoretical issues one presumes that the computer is non-interactive - it simply boots, performs a series of calculations, and then turns off and leaves the operator to manually inspect the computer's memory at the end to find the results.

state transition table for state B and value 1, we are told to stop.



In the above example, we weren't computing anything (we never hit a state/value combination that changed what was on the tape), but nonetheless it qualifies as a program. Turing machines differ from each other on the basis of what is in their state transition table, and what the starting contents of the tape/memory are.

Interestingly, the algorithm for computing any possible computable function can be defined using some Turing Machine. Even more interesting, there is a class of Turing Machines, called a Universal Turing Machine, whose state transition tables are such that the machine can perform any computable function by only changing the machine's memory.[51] Therefore, to create a machine that allows us to make a program

[51] Turing, "On computable numbers," 127-128; Note that all modern microprocessors are Universal Turing Machines.

of arbitrary complexity within the machine's memory requires that the machine be a Universal Turing Machine. That's why most computers are Universal Turing Machines. You only need to add software to get it to perform new functions. Otherwise, we would have to purchase new hardware for most programs.

Universal Turing Machines have several interesting properties. First of all, they are chaotic.[52] That means they are, according to the Deacon classification scheme mentioned earlier, second-order emergent systems. This means that it is impossible *in the general case* to know the final outcome of the program except by running it.[53] A corollary of this is know as the *halting problem*. The halting problem states that it is impossible to determine whether or not a computer program will ever halt in the general case. The reason for this is that in order to determine whether or not the program will halt, we will have to run it (per the implications of it being a chaotic system mentioned earlier). However, if we run it, and the program will never halt, it would take an infinitely-long period of time to determine this, since it will take the program an infinitely-long period to run. Therefore, the question of whether or not a program on a Universal Turing Machine ever halts is not a question whose answer can be computed.

In addition to this, most possible programs which contain loops never halt, while most programs which programmers create must contain loops to function, and do in fact halt.[54] Therefore, programmers appear to be dealing in the most difficult space for the halting problem, and doing so effectively. In addition, programs written by other

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[52] Stephen Wolfram, "Universality and Complexity in Cellular Automata," *Physica D* 10, 31-32.
[53] It is possible to analyze a subset of programs as to what their outcome would be, but there is no generally-applicable way of doing this.
[54] W. B. Langdon and R. Poli, "The Halting Problem in Von Neumann Architectures," *Lecture Notes in Computer Science* 3905, 237.

programmers must be analyzed by a programmer, and a programmer must be able to determine whether or not a program written by himself or someone else halts. Therefore, it appears that, on a practical basis, humans are able to solve the halting problem.

To summarize the argument:

1. General purpose programming requires programming languages that are Universal.
2. The "halting problem" states that there is no computable way that can tell for sure if a program written in a Universal language halts.
3. Humans are able to solve the halting problem as a matter of practice for programming computers (if the programs didn't halt, the program would not work).
4. Using the definition for physics established earlier, a physical system is unable to solve the halting problem
5. If humans are only physical systems, 3 & 4 are in apparent contradiction.

To resolve the contradiction, one simply needs to move beyond the notion that physics is the only metaphysical reality at play, and there are other elements or aspects that need to be accounted for. Note that the argument is not based on either the fact that we don't know all physical or neurobiological laws nor the fact that we don't have the computing *power* to compute the answer. The halting problem holds so long as physics remains computable, no matter whether or not the relevant physics is *practically* computable, or whether or not we know all of the laws of physics or neurobiology.

One might argue that the set of programs which computer programmers attempt is not open-ended, and therefore we are only able to make this determination on a subset of computer programs, which happens to coincide with the subset of computer programs which we attempt. However, if the subset of programs which were attempted are those that are not subject to the halting problem, then we would not need a Universal Turing Machine to implement them. All experience in computer programming shows that Universality is not optional for a computer programmer.[55] In addition, the tasks which are assigned to computer programmers are usually not assigned *by* computer programmers, and therefore those making the assignment are not aware of the theoretical complexity problems. Therefore, computer programmers are tasked with the computationally impossible task of creating computer programs for problems of arbitrary difficulty which appropriately halt.

That is not to say that there are not practical limits to what can be accomplished. First of all, there is the practical problem of comprehending the program itself. This takes physical time, and is a real limit on what a person can legitimately perform. For instance, if the program was a a trillion lines long, the person could not even read the program in a lifetime, much less determine whether or not it halts. In addition, it should be noted that there exist programs for which the halting determination has not been discovered. Many conjectures within number theory can be represented as a computer program, and the truth or falsity of the conjectures will determine whether or not it halts. Take the twin primes conjecture. This states that there are infinitely many prime

[55] The exceptions to this are programs which are merely plugins or customizations to a larger-scale system which does the real work.

numbers n such that n and n+2 are both primes. This can be written down as a program

```
function exist_twin_primes_greater_than(n):
  if(prime?(n) && prime?(n+2)) then return true
  otherwise return exist_twin_primes_greater_than(n+1)
```

If the twin primes conjecture is true, then this program will always halt for any input. If it is false, there exists an n for which this program will not halt.[56] It might appear that this is a serious problem for the veracity of my thesis. My conjecture is that it is solvable by humans, but is that conjecture convincing? I would contend that the validity of mathematics depends on the rationality of this belief. If we believed that such functions were insolvable, we would not try. But the nature of science is for humans to extend beyond the apparent difficulties, and create novel solutions to hard problems. Therefore, while this conjecture cannot be proven, it appears that its validity is the basis on which we engage science.

Therefore, it looks like there is an aspect of humanity which is going beyond what physics can describe. There is a creativity for solving problems that is not arising from physics and equations within our brains, but tapping into something deeper that is able to transcend the computational limits of the physical world.

A similar phenomena occurred in the area of logic, with Kurt Gödel's incompleteness theorems. What these theorems say is that, for any symbolic system, there exists true statements about the symbolic system which cannot be proven by the axioms of the system itself.[57] In addition, it appears that humans can both construct

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[56] C. S. Calude, E. Calude, and M. J. Dineen, "A New Measure of the Difficulty of Problems," *CDMTCS Research Report Series* 277 (February 2006), 3.
[57] Albert Voie, "Biological Function and the Genetic Code are Interdependent," *Chaos, Solitons, and Fractals* 28, no. 4 (2006), 1000.

such statements, and evaluate their veracity (otherwise Gödel's incompleteness theorems would be unproven).[58] So how are these statements reachable and provable, if not by the axioms of the system? The human mind does not appear to be constrained by the same limits that constrain mathematics. Similar to the halting problem, the human mind appears to be able to create novel solutions which are outside the reach of a physical system to compute. This is contrary to the ability of any system which maintains the causal closure of physics (which nonreductive physicalism does).

Robertson shows a similar result when discussing how the human mind can create new axioms of mathematics, which for Robertson is the same as creating information. As Robertson puts it,

> There is perhaps no clearer demonstration of the ability of free will to create new information than the fact that mathematicians are able to devise/invent/discover new axioms for mathematics. This is the one thing that a computer cannot do. The new axioms produced by mathematicians contain new information, and they cannot be derived from other axioms. If they could, they would be theorems rather than axioms.[59]

Robertson expressly contrasts this with the capabilities of physics, for many of the same reasons outlined previously. He says,

> AIT [algorithmic information theory] appears to forbid free will not just in a Newtonian universe, or in a quantum mechanical universe, but in every universe that can be modeled with any mathematical theory whatsoever. AIT forbids free will to mathematics itself, and to any process that is accurately modeled by mathematics, because AIT shows that formal mathematics lacks the ability to create new information[60]

What Robertson is saying is that if you can model processes with mathematics, then those processes would be devoid of the ability to create new information, but could

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[58] Voie, 1001.
[59] Douglas Robertson, "Algorithmic Information Theory, Free Will, and the Turing Test," *Complexity* 4, no. 3 (1999), 31.
[60] Robertson, 26.

only derive information from existing sources. Therefore, because axioms are not derivable from other axioms of the system (or else they would be theorems), the creation of mathematical axioms is the same as the generation of new information. This is impossible within the framework of mathematics (and therefore any mathematical physics), but required for the pursuit of mathematics.

Now, a physicalist might still make an epistemological objection to these ideas. That is, even if physicalism might not be fully descriptive of the human mind, it has a value in that what remains unexplained by physicalism is not usefully described in a way that is helpful for knowledge. If this objection were true, you would have the physical, which was available for inquiry, and the mysterious, which transcends the physical, but was beyond inquiry. Therefore, an attempt to describe everything physically would have value, because where physicalism fails there would be nothing else better to replace it with.

However, this objection would only make sense if the only types of functions which were describable and usable by investigators were deterministic ones. But, in fact, the random function, used in quantum physics and other scientific endeavors, provides a role model for how non-algorithmic functions can be usefully characterized. The random function, for instance, is non-algorithmic, because one cannot implement a truly random function via computable rules. Von Mises, for example, described randomness in a way which is explicitly non-algorithmic, yet provides a description for it. He pointed out that random processes produce events that are distributed in a standard statistical pattern, and that pattern remains no matter what algorithmically-definable

infinite subset of events are chosen.[61] This implies that the random process itself cannot be algorithmically-definable, because then we could algorithmically define an infinite subset which yielded a different distribution; but nonetheless it is *characterizable*. The point of this is that non-algorithmic processes can and have been characterized. They are used within science without a physical basis for them, or a way to calculate the next results. Therefore, if one views human novelty as a non-algorithmic process, it may be possible to describe it in a way that does not reduce it to an algorithmic notion.

Another way of usefully examining the creative aspect of humanity is suggested by Turing himself - give the mysterious elements an explicit representation. Even though the halting problem is unsolvable computationally, there are in fact even harder computational problems. To show this, Turing invented a special non-algorithmic operator, called an *oracle*, which solves a computationally unsolvable problem (such as the halting problem for an arbitrary Turing machine) instantaneously.[62] This oracle is merely an imaginary theoretical device, since it cannot be implemented. Nonetheless, having the oracle operator allows us to reason about what problems we would be able to solve if we had access to such an operator. An *oracle machine* is a Turing machine which also has access to an oracle operator. Turing and others have used oracle machines to describe the complexity of problems that are harder than the halting problem. In other words, even if we had an oracle to determine the result of the halting problem, some other computations are still undecidable algorithmically.

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[61] Anthony Eagle, "Randomness is Unpredictability," *British Journal of the Philosophy of Science* 56 (2005), 756.
[62] Alan M. Turing, "Systems of Logic Based on Ordinals," in *The Undecidable: Basic Papers on Undecidable Propositions, Unsolvable Problems, and Computable Functions*, ed. M. Davis (Raven Press, 1965), 166-167.

This suggests that we may be able to model the operation of the human mind better by, instead of thinking of it as only a physical entity, thinking of it as a physical entity connected to an oracle, or perhaps some operator which often acts like an oracle. This suggests a research program of evaluating human computational abilities to see for just what problems humans have an oracle-like operation, or, if it varies by individual, what the parameters of these oracle-like operators are. The oracles themselves could then be characterized non-algorithmically. As such, they would be outside any conception of physics which is based on computation.

The parallels between human reasoning powers and oracles aren't exact - for instance, Turing's oracles give their results in a single computational step, while humans tend to ponder. Turing's oracles are always right the first time, while humans must often stumble in the dark before finding the light. Perhaps an operator that matches human experience a little more closely would be a "framing" oracle. That is, an oracle which is able to sort out relevant and non-relevant data (sensory and memory) in a single operation. This would match itself better to the circumstances of finite beings better than a halting problem oracle. In any case, making an explicit representation for such operators will enable us to work with ideas which are found in human experience but are likely uncomputable by physical means.

So, far from having "no need for that hypothesis,"[63] it seems that neuroscience does in fact need nonphysical causation to account for aspects of human creativity, and perhaps its failure to look into nonphysical causes for mental action have limited its

[63] Murphy, "The Problem of Mental Causation," 143.

explanatory power. In fact, it may be that the existence of science requires such non-computable human creativity for its ongoing operation.

Kunz has suggested that the problem isn't so much the immateriality of the body, but rather the language of mathematics, and that great scientists such as Einstein instead used images to reason past a mathematical level.[64] Others, such as Hermann, have made similar suggestions.[65] Herrmann noted that what is considered "physical" and "immaterial" varies historically, which is precisely why I established a definition of physics based on computation, which is its current mode of operation. Getting outside of computation would fundamentally alter how we view physics. However, as has been pointed out, nonreductive physicalism uses the term "physicalism" rather than "monism" so as to be clear exactly what *sort* or reality is being specified - the one describable by the mode of modern physics.[66] In addition, using images only moves beyond computation if the important part of the image lies outside of the images' computational representation. If a computational description of the image is an adequate stand-in for the image itself, then we have not moved beyond computation. In order to move beyond computation, one would need to say that it is the *experience* of the image which was important. If this is the case, then that leads us to the question of *qualia*, which will be addressed in a later section.

Choice and Humanity

Nancey Murphy has made much progress on the notion of free will from a physicalist viewpoint. First, Murphy has correctly pointed out that the free will problem

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[64] Kunz, personal correspondence, April 26, 2010.
[65] Robert Herrmann, "The Rationality of Hypothesized Immaterial Mental Processes," *Creation Research Society Quarterly* 43(2), 127.
[66] Murphy, "Nonreductive Physicalism," 116.

is actually a multiplicity of related problems.[67] Second, Murphy has shown that physicalism is compatible with the notion that humans make choices for the reasons which they state. That is, because of the symbolic power of the brain, physicalism doesn't mean that our choices are different than the set of values that we believe them to be based upon. Because we can symbolically represent and analyze situations, Murphy has noted that we can indeed make decisions which can be classified as "moral" because these decisions are based upon a valuation of the greater good, and how our actions might affect this greater good.[68]

While it may be the case that Murphy has been able to demonstrate that *moral* decisions are possible in terms of evaluating symbolic information physically, the question of *immoral* behavior is more problematic.

First, we must look at the question "what is choice?" Choice is a bit of a paradox, because the two modes of causation employed in physical description - determinism and indeterminism - are unable to be combined into a satisfactory description of choice. Determinism makes real choice impossible because something isn't much of a choice if it was predetermined. Even if a person made their decisions according to the mechanism outlined by Murphy, it is difficult to envision it being a choice if that person could not have done it any other way. Is it reasonable for someone to be guilty of a crime if they could not have done it any other way? Is it reasonable for someone to be praised for a righteous action if they could not have done it any other way? It may be that they did these things for the right or wrong reasons, but it is difficult to define any

[67] Brown and Murphy, *Neurons*, 268-269.
[68] Brown and Murphy, *Neurons*, 255-256.

action as praiseworthy if the person doing the action could not have performed it any other way. As Robertson quotes Kant, "there is no 'ought' without a 'can'."[69]

Indeterminism on its own doesn't get us much further. Heisenberg, for instance, views free will as the application of indeterminism in neurobiology, saying that the will is free because quantum randomness does not have an external cause.[70] However, is flipping a coin a choice? If someone's moral action was determined based on a coin flip over which they had no control, it doesn't seem to make it any more moral than the deterministic option. Likewise for the immoral action.

Therefore, it seems that rather than determinism and indeterminism being the only categories available, that choice itself might be a category of its own, as an alternative to either one. Physicalism, even Murphy's nonreductive kind, does not have room for choice as a causal category (at least for humans). While Murphy acknowledged that there was more to decision-making than brain function, none of her possibilities included human choice. Murphy says, speaking of rational choice-making, "*In part* they are explainable as brain functions, but their full explanation requires attention to human social relations, to cultural factors, and, most importantly, to God's action in our lives."[71] While this differs considerably from reductive physicalism, which denies any sort of rationality to brain processes, it does not provide any space for the *human* to make choices independent of biological predispositions.

The distinctions between determinism, indeterminism, and choice are important. If life were ruled by determinism and indeterminism, then the appropriate moral

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[69] Robertson, 26.
[70] Martin Heisenberg, "Is Free Will an Illusion?" *Nature* 459 (2009), 164-165.
[71] Murphy, "Nonreductive Physicalism," 116.

categories would include “working,” “not-working,” and “stuff-happens.” If someone made a harmful choice, then the relevant category for the person wouldn’t necessarily be immoral, because they couldn’t have done it any other way. Instead, if their decision-structures in their brain were not elevating the right values, the appropriate moral category would simply be “not-working.” A person wouldn’t make moral condemnations on their computer when it shorts out from a gravy spill. Instead, they would take it to a repair shop and have it fixed. A person also wouldn’t make moral judgments on it when it is misprogrammed, although they might send a few swear words in its direction.

The only appropriate maneuver for reducing harmful actions in a choiceless world is to “fix” the not-working system. If the physicalist perspective is true, then the best hope for humanity’s improvement would be for the science of neurophysics to improve so that neuroscientists could fix harmful thoughts and behaviors by making appropriate brain-state changes.

Of course, we have a similar means of controlling behavior available to us today, though not with as precise and clean of a methodology as the scenario described above. It is called brainwashing. The goal of brainwashing is to remove the choice of the subject, and to get the subject to make choices according to the patterns of the brainwasher. A physicalist may argue that they believe also that brainwashing, even if done without physical harm to the subject, is immoral. However, on what basis would that be rational? If the problem with brainwashing is the removal of choice, what does that correspond to in the physicalist system? If it is merely the removal of indeterminacy, then there seems to be no reason morally to be against it. If it is to

change the determinacy to a new determinacy, then it seems like the only difference between brainwashing and other forms of persuasion is that brainwashing is much more effective. If, instead, choice is a fundamental causal aspect instead of just a description of the reasoning used to make a selection among alternatives, then removal of choice is itself subject to moral calculation.

It is interesting to note that many of the aggressively physicalist states in the 20th century used brainwashing techniques to suppress dissidents. Perhaps instead of it being an unfortunate coincidence of misguided regimes, it is actually intrinsic to the logic, and the resulting moral calculus, of physicalism taken to its logical conclusion.

Such a position is already being argued for in the scientific literature. To use a current example, Cashmore, in his inaugural paper for the National Academy of Sciences, argues for the "elimination of the illogical concept that individuals are in control of their behavior in a manner that is something other than a reflection of their genetic makeup and their environmental history."[72] As such, Cashmore proposes that a panel of experts advise the *treatment* of the defendant if the defendant is found guilty of the crime. Here, crime is viewed as an illness to be treated, since, according to the author, crime is not caused by the volition of a person, but by numerous deterministic or stochastic causes in the environment and within the defendant's body.[73]

Choice is specifically important to Christians not only for its relevance to philosophical moral categories, but also because so much of the Biblical narrative is defined by choice. Two poignant passages from the Hebrew Bible include "choose this

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[72] Anthony Cashmore, "The Lucretian Swerve: The Biological Basis of Human Behavior and the Criminal Justice System," *PNAS Early Edition* (February 8, 2010), 5.
[73] Cashmore, 5.

day whom you will serve" (Joshua 24:15), and "I call heaven and earth to record this day against you, that I have set before you life and death, blessing and cursing: therefore choose life, that both thou and thy seed may live" (Deuteronomy 30:19). Both emphasize choice, and the second passage especially seems to indicate that both options are real, viable options for the people to whom they were given. The reason heaven and earth are recording this day against them is so that in the future, if they choose falsely, it will not be because they lacked the ability to choose correctly.

The existence of this passage is supposed to create the correct choice as a viable option for the people considering their options in the future. Thus, it is the person's own fault if they fail to choose rightly. However, if, instead of free choice, if a person's neurobiology sets them up to make a bad decision, then how are they actually culpable? It would seem that in such a case, heaven and earth couldn't testify against them, because, even though they may have known about the event, their available moral calculus didn't weigh it very high. This weighing, if done deterministically, was outside of their control. If, on the other hand, it was a simple indeterminacy, it means they just had a bad roll of the dice. This passage, however, is making a moral case against those people in the future precisely because they *could have chosen correctly* but did not.

An even more direct instance of this in the story of Cain and Abel.

> The LORD said to Cain, Why are you angry, and why has your face fallen? If you do well, will you not be accepted? And if you do not do well, sin is crouching at the door. Its desire is for you, but you must rule over it. (Genesis 4:6-7)

It is interesting to note that in this passage, God is speaking to Cain himself, and Cain chooses not to listen. So why is God bothering to talk to Cain at all? If

determinism is the rule, then why was God's speech to Cain ineffective? Doesn't God know Cain's neurobiology enough to know what would turn Cain around? If Cain's biology is so far gone as to be unsavable, why would God even bother? If it is a simple indeterminacy, and God makes a habit of using that indeterminacy to accomplish His purpose,[74] then why not here? The moral questions this brings up are only understandable outside of a physicalist anthropology. In Murphy's nonreductive physicalism, the only actor who is allowed to move outside of the causal closure of physics is God.[75] However, it seems evident from the text that God wants to make sure that Cain has the option of doing right available to him, and that Cain gets to make his own choice.

It is true that a concept of choice is quite mysterious. However, as was shown for the notion of creativity, it does not advance human knowledge to simply wish it away and replace it with less mysterious notions which don't perform the same functions. Instead, we should name the mystery and characterize it as best we can. Then we can make better and more appropriate decisions using a moral calculus that appropriately honors the mystery we find ourselves in.

Inverting the "Hard Problem" of Consciousness (the *qualia* problem)

In 1995, David Chalmers noted that there is a conceptual gap between what he calls the "easy problems" of consciousness and the "hard problem" of consciousness. The "easy problems" would, essentially, be all of those that could be answered by the field of neurophysics. Chalmers describes the "hard problem" like this:

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[74] Murphy, *Bodies and Souls*, 131.
[75] Murphy, "Nonreductive Physicalism," 116; Brown and Murphy, *Neurons*, 79.

> The really hard problem of consciousness is the problem of *experience*. When we think and perceive, there is a whir of information-processing, but there is also a subjective aspect. As Nagel (1974) has put it, there is *something it is like* to be a conscious organism. This subjective aspect is experience. When we see, for example, we *experience* visual sensations: the felt quality of redness, the experience of dark and light, the quality of depth in a visual field. Other experiences go along with perception in different modalities: the sound of a clarinet, the smell of mothballs. Then there are bodily sensations, from pains to orgasms; mental images that are conjured up internally; the felt quality of emotion, and the experience of a stream of conscious thought. What unites all of these states is that there is something it is like to be in them. All of them are states of experience...It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does.[76]

Charmers' notion of the “hard problem” is the problem of connecting the physics of the brain to actual conscious experience (often termed *qualia*). According to Chalmers, even if we have a 100% predictive model of how the brain functions, that doesn’t bring us even an inch closer to understanding the hard problem - why should physics give rise to experiential qualities? And how would such a problem even be addressed, given that we only have access to our own consciousness?

It is puzzling that Murphy, while writing quite triumphantly about the progress of neuroscience leaving nothing for souls to do, almost entirely avoids the problem of consciousness. In her book-length treatment of the soul, she devotes four pages to the subject, where she mostly passes on explanation. She says,

> There are two prominent attitudes in current literature regarding consciousness. One is represented by the title of philosopher Daniel Dennett’s book, Consciousness Explained. The other view is the that of philosophers such as Thomas Nagel, designated by their opponents as the “new mysterians,” who claim that consciousness is essentially inexplicable. A middle position might be more reasonable. In previous

[76] David Chalmers, “Facing Up to the Problem of Consciousness,” *Journal of Consciousness Studies* 2, no. 3 (1995).

> centuries life was as mysterious as consciousness is now...[our new knowledge] gives us a sense of *understanding* life, as well as being able to list its necessary and sufficient conditions.[77]

What Murphy is proposing is that we should take on faith the claim that science will be able to understand it, even if we don't have the understanding now. The problem, however, is a conceptual one. Understanding the hard problem of consciousness requires a different conception of reality than the one physics offers. It may be true that we will be able to understand it some day, but if so, it will be because we have altered our conception of nature to go beyond physics, not because of some advancement in physics.

To see why this is so, we must first realize that at least one of the reasons for ethics is that we assume that other people have consciousness. A computer, no matter how badly broken or dismembered, has no sensation of "pain." A human, however, does. Therefore, protection of human consciousnesses from undue experiences of pain is an ethical priority. However, the same cannot be said of a computer. The moral imperatives against a conscious being are not the same as the moral imperatives against a computer.

This matters because if the "easy" problems of consciousness are solved, then they are representable on a synthetic medium (such as a computer, or even an analog device). Therefore, the question is, if we then model our solutions to the "easy" problems on a synthetic medium, at what point is it conscious? If we were able to completely model the equations governing the brain, as well as an initial state which matched the state of a conscious person's brain, and even implement them in a

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[77] Murphy, *Bodies and Souls*, 60-61.

physical medium, would our model then start to experience? Would our model then be subject to ethical concerns? It seems odd that there could be ethical concerns relating to the treatment of a mathematical equation. It seems even more odd that the representation of a mathematical equation on a synthetic medium would cause that medium to start to experience pain, or joy, or sorrow.

We can already *represent* pain symbolically. There is no technical issue with representing any sort of sense information symbolically in a computer. There is also no technical issue with creating the ability to respond symbolically. There is also no technical issue with creating a symbolic understanding of the computer in the computer itself. Finally, there is no technical issue with creating within a computer a symbolic representation of the decision process that was used for a particular choice. In fact, modern databases can dynamically convert a logical query of data into a physical query plan for retrieving that. Not only that, it can then present both the results of this query, and the plan itself, as well as the calculations it used to choose that plan. Therefore, in terms of nonreductive physicalism, computers have the ability to examine their own mental processes.

So, all of this to say, if qualia is equivalent with these symbolic processes, then, even at the technology level available today, computers could be constructed in a way in which they would be considered conscious. They may lag behind humans in many areas - perhaps even far behind - but nonetheless it seems that they are capable of the physical processing which makes up qualia in the physicalist anthropology. Would we then attribute moral worth to a computer? This notion seems highly absurd.

The notion of attributing qualia to any purely physical system is similarly problematic. Since there is no representation of qualia in physics, and because physics deals with computable outputs to equations, then there is no way to attribute qualia to a physical entity which would not also attribute it to the description of the computer program above. Matter, motion, and waves are not experience.

It is possible that an expansion or alteration of monism may provide solutions to these problems. Idealism or panpsychism could both be potential solutions to the problem. However, as Murphy points out, nonreductive physicalism is intentionally much more specific than emergent monism, and rules out anthropologies such as idealism and panpsychism.[78] Therefore, it seems that nonreductive physicalism leaves out an important reality that is needed to properly decipher experienced reality, and likewise, ethics.

Responding to Murphy's Case Against Dualism

Murphy argues for nonreductive physicalism as not just a possibility for a Christian anthropology, but as being a fundamentally preferable view to the alternatives, especially dualism. While this paper argues for a more general notion than just substance dualism (though one that is compatible with substance dualism), it is worth noting that Murphy's main problems with dualism lack philosophical force.

The Interaction of Spiritual and Physical Forces

One of the Murphy's key problems with dualism is the ability for dualists to provide a causal linkage between spiritual and physical phenomena. Put simply - how

[78] Murphy, "Nonreductive Physicalism," 116; Murphy, *Bodies and Souls*, 2.

would a soul cause a body to move? Murphy consistently places this argument at the forefront of criticisms of dualism.[79] According to Murphy:

> The problems with dualism, in my judgment, are insurmountable. First, it may well be impossible to give an account of mind-body interaction: how can something non-material interact causally with material entities?[80]

Murphy first overestimates the extent to which this even could be a problem. It was long unknown how both electromagnetism and physics could both be true, as they seemed to have rules which violated each other. It was long after the development of both of them that Einstein showed how they could both be true. It did not do any damage to either physics or electromagnetism for them both to continue side-by-side while the linkage between them was reached. Similarly, not knowing the linkage of spiritual and physical phenomena is likewise not a catastrophic problem for either dualist physicists or dualists theologians.

Murphy makes an additional critique of mind-body interactionism - the law of conservation of energy. One possible solution to the soul-body interaction problem is that the soul might contribute energy to the body to cause it to move. Murphy argues that the law of conservation of energy requires that if energy is transferred into the body, then it must be mysteriously transferred away from some other part of the universe.[81] The problem with this argument manifests itself in three ways. The first is that the law only applies to closed physical systems. If the soul is not physical, then the soul's participation would preclude the necessity of the law's total application (it would still hold

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[79] Murphy, "Nonreductive Physicalism: Philosophical Challenges," 97; Murphy, *Bodies and Souls* 45-46; Murphy, "The Problem of Mental Causation," 143; Murphy, "Human Nature," 7; However, this argument was surprisingly absent from "Scientific Perspectives on Christian Anthropology," which focuses on the Lakatosian epistemological argument and the evolutionary argument.
[80] Murphy, "The Problem of Mental Causation," 143.
[81] Murphy, *Bodies and Souls*, 46.

everywhere except where the creation/removal of energy occurred). The second is that there is no reason to assume that the soul must obey physics. Physics applies to material systems. If the soul is not physical, then there is no reason to assume that the soul itself must be restricted to the laws and the equations written for physical systems. Finally, the global nature of the conservation laws are only derivative of their local nature. That is, the reason that we assume that conservation laws work globally is simply because we extrapolate it from local conservation laws. If the soul were interacting with a local physical system, adding or subtracting energy, there would be no reason, physically, for it to be necessary for it to be made up anywhere else in the universe.[82]

Not only are Murphy's objections not as devastating as Murphy supposes, but Murphy is actually overtly inconsistent on this subject. If the problem of non-material causes influencing material causes is a general problem, then the problem would also exist for God, whom Murphy agrees is a non-material being.[83] However, as noted in the summary of nonreductive physicalism, Murphy in fact gives an account which provides God a causal role in human events - God can manipulate the fluctuation of quantum states to influence thoughts in our minds.[84] In fact, Murphy allows for God to manipulate any part of creation through the selection of quantum states.[85] If that is a possible way for non-material beings to manipulate material bodies, then why is it not a possible way for a non-material soul to do so?

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[82] J. Brian Pitts, personal correspondence regarding a paper of his in progress titled "Energy Conservation, Mental Causation and Real Physics: Question-Begging *A Priori* and Interesting *A Posterior*i Objections," February 27, 2010.
[83] Murphy, "Nonreductive Physicalism," 116.
[84] Murphy, "Cognitive Science and the Evolution of Religion," 275.
[85] Murphy, "Science, Divine Action, and the ID Movement," 163.

The Evolutionary Argument

Another argument Murphy makes against dualism is what I will term the "evolutionary argument." Murphy makes the argument:

> Many Christians evaded this materialist conclusion [that evolution shows that humans were as material as the animals] by granting that the human body is a product of evolution, but maintaining that God creates a soul for each individual at conception...It runs into difficulties, however, when we ask when the *human* species appeared.[86]

First of all, it should be noted that it only applies to substance dualism *for those who think that humans have souls and other animals don't*. This argument would not apply to versions of substance dualism which envision animals having souls as well. While this "human-souls-only" view is widespread, and includes Descartes, it isn't a necessary feature of substance dualism. In any case, even for the "human-souls-only" view, the argument fails on its own merits as will be shown.

Murphy points out that there are many hominid species, and suggests that a gradualistic evolution prevents us from assigning a soul to one and no soul to the other.[87] Murphy says, "To claim that humans alone have the gift of a soul seems to force an arbitrary distinction where there is much evidence for continuity."[88] However, if the soul is non-physical, then why should physical continuity say anything about non-physical discontinuities? The only reason to presume such a link would be if one already believed physicalism to be true.

Another argument Murphy makes along this line is to point out that Neanderthals participated in many practices which overlap distinctive human practices which are

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[86] Murphy, *Bodies and Souls*, 48.
[87] Murphy, "Scientific Perspectives," 87; Murphy, *Bodies and Souls*, 48-49.
[88] Murphy, *Bodies and Souls*, 49.

historically thought of as part of having a soul, such as creating art and burying their dead.[89] Neanderthals are frequently placed by biologists in an evolutionary side-branch rather than part of the line leading to humans.[90] Therefore, the argument goes, humans and Neanderthals must have either both had a soul (which, to the arguer, seems arbitrary) or they both did not have a soul, and simply shared in biological distinctives which were on their evolutionary trajectory.[91] Similar to the "biological similarity" argument, this argument could only have force against dualistic views where *only* humans have souls.

In any case, for Neanderthals, there is little reason to separate them from humans in any meaningful way. It is true that they had distinct differences in morphology from homo sapiens. However, current evidence shows that they interbred.[92] Actual interbreeding, by most species concepts, clearly puts two groups into the same species.[93] Therefore, not only does the evolutionary argument only make sense as a criticism of a *subclass* of dualism, the premises of the critique do not seem to be at all definitive.

The Lakatosian Epistemological Objection to Dualism

While Murphy concedes that dualism is a possibility that can't be totally refuted philosophically, she tries to make the case for physicalism epistemologically - that physicalism is a "positive heuristic" for progress in research programs, and that dualism

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[89] Murphy, "Scientific Perspectives," 88.
[90] Francisco Ayala, "Human Nature: One Evolutionist's View," in *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature*, ed. W. S. Brown, N. Murphy, and H. N. Malony (Fortress Press, 1998), 33-34.
[91] Murphy, "Scientific Perspectives," 88.
[92] Eric Trinkaus, "European Early Modern Humans and the Fate of the Neandertals," *PNAS* 104, no. 18, 7367.
[93] Kevin de Queiroz, "Ernst Mayr and the Modern Concept of Species," *PNAS* 102, supplement 1, 6606.

provides no such heuristic.[94] Earlier sections have already covered this to a large degree, showing how non-material notions can be constructively integrated into a research program.

In addition, the mechanism of body/soul interaction is already the subject of a fruitful neuroscience research program termed "Quantum Interactive Dualism."[95] This program uses the same mechanism for understanding body/soul interaction that Murphy uses for God/world interaction - manipulation of quantum uncertainties. Even if Murphy was unaware of this research program, her own research program regarding God's action in the world seems to imply that such a thing is possible.[96] It is difficult to see how Murphy finds this to be a legitimate difficulty along philosophical or epistemological lines, since her own theories (which we would assume she would think of as being legitimate research programs) utilize the same mechanism.

In any case, the prior discussion of creativity, consciousness, and choice show how non-physical concepts can be usefully integrated into a research program and reasoned with by converting non-physical processes into non-algorithmic operators, and describing such operators using non-predictive descriptions, similar to the way randomness is defined mathematically.

The Ministry Objection to Dualism

Murphy also has a practical ministry objection to dualism. Her objection, basically, is that the *idea* of a soul has caused people to take less interest in God's

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[94] Nancey Murphy, "Physicalism Without Reductionism: Towards a Scientifically, Philosophically, and Theologically Sound Portrait of Human Nature," *Zygon* 34, no. 4 (1999), 563; Murphy, "Nonreductive Physicalism," 131; Murphy, "Substance Dualism: A Nonreductive Physicalism Response," 68.
[95] Henry Stapp, "Quantum Interactive Dualism: An Alternative to Materialism," *Journal of Consciousness Studies* 12, no. 11 (2005), 43-58.
[96] Murphy, "Science, Divine Action, and the ID Movement," 164.

creation, social justice, and God's reign on earth. Because they are busy caring for their souls and preparing their souls for eternity, believers neglect the advancement of God's kingdom on earth.[97]

There are several problems with this view. The first problem, is that it over-equates the platonic vision of the soul with the Christian incorporation of the platonic view. While Christian theology has certainly borrowed ideas from many sources, it rarely borrows them unchanged. I contend that most modern dualistic believers would find Plato's vision very strange indeed. Many believers equate caring for their souls with participating in social justice and God's reign on earth.

The second problem is that if anything might cause a person to look away from this life, it would be the resurrection, not the soul. Having a "second part" doesn't mean that the first part is ignorable. However, the idea of being regenerated can mean to many that whatever parts used to exist can be safely ignored, since they will be replaced anyway.

Even so, I think that the idea of the resurrection (and the soul - to the extent that they are associated in the minds of Christians) has been helpful more often than not. What it has done is to allow Christians to think in time-scales beyond the current life, and therefore be able to self-sacrifice more, since there is more to life than the body we now have.

A better practical ministry objection to dualism has been formulated by Kunz. Kunz notes that dualistic notions tend to focus Christian discipleship, worship, and discernment on the mind over against the body. The mind (presumably the spiritual

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[97] Murphy, "Scientific Perspectives," 97-98.

part), in such a setup, is closer to God, and therefore is the focus of our spiritual energies. Such a view tends to leave the physical part of the person out of the equation in Christian nurturing.[98] However, this isn't necessarily a problem with dualism per se, but rather a problem with the platonic concept which was not sufficiently Christianized. Deuteronomy 6:4 says "And thou shalt love the LORD thy God with all thine heart, and with all thy soul, and with all thy might." This emphasizes the combination of the person in worship of God. Therefore, the objection is rightly placed - that a focus on one part of the person to the exclusion of another is not a Christian attitude. However, this is true whether or not the person is ontologically conceived as one part, or two or three or thirty.

It is also interesting to note that this verse was altered when quoted in the New Testament. Mark 12:30 adds "mind" to the list of parts of us that were to love God with. Because of this, I agree with Murphy's suggestion that the specific ontological divisions of the human were not the important points of the verse. Rather, whatever the ontological or aspectual divisions, we need to be sure that they are worshipping God.

In addition, there is, I think, a practical usefulness of the soul in Christian life. The soul, as normally conceived among Christians, is the part of us that is responsible for conscious feelings. In addition, absent some soul-like concept, it is difficult to separate out which parts of the created world have or do not have conscious feelings. Therefore, the soul provides for Christians a way to understand each other in a deeper way than the rest of creation. While stewardship is required of all of creation, special thought is required for creations which have conscious feelings. The soul provides the

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[98] Kunz, unpulbished dissertation.

intellectual justification to treat each other as more than objects, but as subjects as well. Without a concept of a soul, humans become tools and objects, to be used just as much and as easily as a tree branch.

Theological Implications

Because of the heavy mixing of science, computation, theology, and ethics throughout this paper, we shall now review the theological and ethical implications of the non-physicalist position.

First, it emphasizes choice as a *fundamental* causal category. Thus, choice is something to be protected, used, and measured against. Murphy's physicalistic account of choice merely means that the high-level moral reasons a person gives for behaving in a certain way are valid, and not simply a reflection of a low-level biological urge. However, this is insufficient for addressing moral culpability. For culpability to occur, the person must have been fully-able to choose either option, and that choice to be *made*, not merely *happened* (as would be the case with such things as quantum indeterminacy).

Second, it emphasizes subjective experience as an important part of a moral calculus. A physicalist must presume that the normal laws of physics and matter are able to produce a subjective experience. If such were true, then one of two things should follow. One possibility is that everything in the world of physics is subjective. The other possibility is that subjectivity is based on complex symbolic organizations of matter, and thus we should suspect our computers of having subjective experience. The second possibility is absurd, and the first possibility casts the range of subjective experience so wide as to be useless for moral calculation. A non-physicalist, therefore,

is better able to make appropriate distinctions between what has subjective experience and what doesn't, so as to allow it to be better used for moral decisions.

Finally, it includes human creativity as part of the natural order of creation. For the physicalist, the only truly creative activity in the world is God's action. Humans, on the other hand, merely follow causes, whether top-down or bottom-up. A non-physicalist can view a human as being able to truly bring about novelty in the world. While the non-physicalist certainly does not deny that creativity has antecedents, it is able to view creativity as not being *controlled* by those antecedents.

I would argue that, while many physicalists indeed hold to many of these theological and ethical ideas, there is a fundamental inconsistency between these ideas and physicalism, or at the very least a disconsonance about them. The non-physicalist positions allow for a conception of reality, theology, and ethics that isn't as awkwardly constrained by theory as nonreductive physicalism.

Conclusion

My intention in this paper was not to provide a complete argument for dualism. Instead, I wanted to narrow the field of potential anthropologies by showing why some of them (namely physicalist anthropologies) fail to address the basic phenomena which is trying to be explained. Along the same lines, I wanted to introduce some ideas and directions for formal ways of representing and describing non-physical phenomena. Namely, by turning mysterious nonphysical behavior into non-algorithmic operators, we can more readily include non-physical elements in descriptions of reality, and reason with them formally.

Finally, I wanted to show why the most common objections to dualism fail to be much of a problem at all. Again, this doesn't specify dualism per se, but it does, I think, show that dualism is at least heading in a direction compatible with life as we find it, and more compatible than that of physicalism. In fact, as alluded to in an earlier section, the pursuit of science may also be more compatible with dualism than physicalism.

The strong statement that I think I can make on the basis of the arguments in this paper is that if physics represents the entirety of an ontological reality, then dualism is in fact required to take care of the phenomena for which physics is categorically insufficient.

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