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Editor's Note: Issue 2

It is with great pleasure that I bring you the second issue of our undergraduate journal, *Acta Cogitata*.

It remains the case that this journal is a vaulting point for some of the best and brightest ideas from the ground floor of professional philosophy. Further, my note in the first issue – that an idea's greatness is not determined by its point of origin, but rather the attention it garners in the public domain and, one hopes, its proximity to the truth – continues resonate.

This second issue begins *Acta Cogitata's* new peer review process. Our first issue's contents were selected and reviewed by professional philosophers, which remains the case for most of the articles in this issue. This issue, however, has articles that were reviewed by student reviewers. I expect this new practice to take over and dominate future instances of the journal. This level of peer review offers a wealth of benefits, not the least of which is that submissions will receive peer comments and feedback as part of the submission process.

This year's authors cover a lot of ground, from troubling social injustices to mind bending metaphysics. Once again, I have to say that I am both impressed and pleased by the time and energy our authors poured into their work. Publication is not only an endorsement of one's work by other philosophers, it stands an impressive accomplishment – an accomplishment built on the back of diligent reading and writing, careful thinking, and the powerful turn of a creative mind. To produce a published paper, at any level, marks the move from student to teacher, and that is no small step. I am pleased to be a part of bringing our authors' ideas to others, and I sincerely hope that these articles will provide a building block for further ideas and discussion.

I look forward to the coming year's submissions and the opportunity to work with student authors, reviewers, and journal staff. *Acta Cogitata* is off to a fabulous start, and handful of new ideas and changes promise to expand the journal in meaningful ways.

Enjoy!

Dr. W. John Koolage

Mission and Purpose Statement

Acta Cogitata is dedicated to providing a venue for undergraduate authors of original philosophical papers to have their work reviewed and, possibly, published. Publication acknowledges the work of outstanding undergraduate authors, rewards their efforts, and provides a home for some thought-provoking projects. In line with this purpose, *Acta Cogitata's* authors retain their copyright so that they may continue to develop these projects. The journal, however, does not publish work that has previously been published elsewhere.

The journal accepts philosophical papers from all areas of philosophy and seeks to promote philosophical discourse in any area where such discourse may be illuminating.

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Defending Downward Causation Only To Bring It Back Down

Michael Pratt, Grand Valley State University

Abstract

The so-called bottom-up threat to free will assumes a bottom-up metaphysics: the view that atoms (or whatever the most basic and fundamental element of material substances is) at the microphysical level dictate the behavior and ontology of material substances at higher macrophysical levels of composition. More specifically, bottom-up metaphysics maintain that all macrophysical states of affairs supervene on their constituent microphysical properties, such that any macrophysical change requires a change at the microphysical level. This metaphysical picture implies that human persons—and consequently, human actions—supervene on what their constituent atoms do or are like. In Objects and Persons, Trenton Merricks argues that a human person having the capacity for downward (mental-physical) causation is both necessary and sufficient for that person to have a choice about what her atoms do or are like, and moreover, that downward causation blocks the bottom-up threat to free will. In "Can Downward Causation Save Free Will?" Justin Capes argues that Merricks's response to the bottom-up threat is unsuccessful. In this paper, I will (i) explain the bottom-up threat and Merricks's response to it, (ii) explain Capes's criticisms of Merricks's response, (iii) argue that Capes's criticisms are unsuccessful in rebutting Merricks's response, and (iv) suggest an alternative way to object to Merricks's response.

Defending Downward Causation Only To Bring It Back Down

In Objects and Persons, Trenton Merricks argues that a human person having the capacity for downward (mental-physical) causation is both necessary and sufficient for that person to have a choice about what her atoms do or are like, and moreover, that downward causation blocks the bottom-up threat to free will. In "Can Downward Causation Save Free Will?" Justin Capes argues that Merricks's response to the bottom-up threat is unsuccessful. In this paper, I will (i) explain the bottom-up threat and Merricks's response to it, (ii) explain Capes's criticisms of Merricks's response, (iii) argue that Capes's criticisms are unsuccessful in rebutting Merricks's response, and (iv) suggest an alternative way to object to Merricks's response.[1]

The Bottom-Up Threat to Free Will

The so called bottom-up threat to free will assumes a bottom-up metaphysics: the view that atoms (or whatever the most basic and fundamental element of material substances is) at the microphysical level dictate the behavior and ontology of material substances at higher macrophysical levels of composition. More specifically, bottom-up metaphysics maintain that all macrophysical states

[1] Thanks to Andrew Spear for the invaluable comments and feedback. Thanks also to Michael Robinson for the conversation and recommendations that spawned this paper.

of affairs supervene on their constituent microphysical properties, such that any macrophysical change requires a change at the microphysical level. This metaphysical picture implies that human persons—and consequently, human actions—supervene on what their constituent atoms do or are like. The argument for the bottom-up threat to free will (hereafter, the bottom-up threat) takes the following form:

(1) If some agent S has a choice about what actions she performs, then S has a choice about what her atoms do or are like.
(2) S does not have a choice about what her atoms do or are like.
(3) So, S does not have a choice regarding what actions she performs.
(4) S having Free will requires that S does have a choice about what actions she performs.
(5) So, S does not have free will.

Premise (1) derives from the bottom-up assumption that every action performed by an agent supervenes on what her atoms do or are like. For, given the relationship between macrophysical states (e.g., some agent's choice) and microphysical states (e.g., some agent's constituent atoms), an agent having a choice about what actions she performs necessitates that agent having a choice about what her actions supervene on—namely, her constituent atoms. It is also important to note that above the argument assumes that the following principle of entailment is valid: "If p entails q, and no one has a choice about the fact that p, then no one has a choice about the fact that q" (Capes 133).[2] This inference rule, taken together with premises (1) and (2), generate the bottom-up threat.

To illustrate, suppose that some agent instantiates some mental state that is followed by her raising her hand. On the bottom-up view, that agent's macrophysical states of affairs (her mental state and subsequent hand raising) supervene on their constituent microphysical states. So, our agent's microphysical states entail her mental state and hand raising, and since she does not have a choice about her microphysical states, she thus does not have a choice about her mental state or about her hand raising. Given this example, it seems intuitive why a bottom-up ontology threatens free will, since free will requires that we do have a choice about what actions we perform—a requirement that is plainly impossible given the truth of bottom-up metaphysics. With the bottom-up threat briefly explained, I will now advance to Merricks's response.

Responding to the Bottom-up Threat: supervience and downward causation

Merricks objects to premise (1) by denying the supervience thesis. More specifically, he denies that mental states supervene on physical states and thus, if the occurrence of a mental state or property amounts to performing an action, (1) is false. E.g., if Sally's mental state of deciding to raise her hand qualifies as performing an action, and that mental state does not supervene on a physical state, (1) is false.

Moreover, Merricks rejects (2), maintaining that human agents have non-redundant causal abilities, insofar as "we cause things not also caused by our constituent atoms in virtue of having conscious mental properties that do not supervene on what our constituent atoms do or are like" (Capes 135). Thus, Merricks concludes that human agents have downward causal control over their constituent microphysical states of affairs, and moreover, that downward causation is sufficient for having a choice about what agents' atoms do or are like; thus (2) is false. With Merricks's response to the bottom-up threat cashed out, I will now explain Capes's criticisms of it.

[2] This inference rule is a version of Peter van Inwagen's 'Rule Beta'. For more on this, see van Inwagen, (1983).

Capes's Criticisms and Cases

Purporting to show that Merricks's response is unsuccessful in dispelling the bottom-up threat—specifically, that it fails to show that (2) is false—Capes distinguishes between what he takes to be two distinct claims:

> (M1) "Human persons have downward causal control over their constituent atoms in virtue of having conscious mental properties that do not supervene on physical states or properties . . .
>
> (M2) Downward control of this sort is sufficient for having a choice about what one's atoms do or are like" (Capes 135).

Capes thinks that (M1) is unproblematic, and moreover, concedes that agents possessing downward causal control is probably a necessary condition for free will. It is (M2), rather, that he takes issue with; for agents possessing downward control "is not sufficient for having a choice about anything, much less about what one's constituent atoms do or are like" (135). Capes points out that Merricks offers little justification for accepting (M2), and suggests that perhaps downward causal control is necessary (but not sufficient) for the kind of 'active power' that agent-causal libertarians require.[3] At any rate, Capes's criticisms purport to show that downward control is not sufficient for having a choice about what one's microphysical states do or are like. Since I have limited space here, it will suffice to say that Capes thinks downward causal control is not sufficient for free action—the agent must also "be able to determine at will how one's causal powers are employed" (136). For, if one has downward causal control, but does not have a choice regarding how that control is utilized, it seems like one would not have a choice regarding what actions one performs.

Capes offers a series of cases that he takes to be counterexamples to (M2). His initial suggestion is this: possessing downward causal control does not imply that one couldn't be determined to employ that power in various ways.[4] If this is possible, and assuming that causal determinism is incompatible with free will, then (M2) is false. Capes first considers a case in which some agent S is causally determined to exercise her downward causal control. In such a case, S's free action would be precluded due to the truth of determinism, but S would have nevertheless exercised downward causal control. Thus, Capes claims, downward causal control "is not sufficient for having a choice abut what one's atoms do or are like" (137).

Anticipating a question begging complaint, Capes posits the following four cases within possible worlds that are indeterministic:

Case 1:
"Imagine . . . that God causally intervenes in the world at a particular moment and brings it about that susan decides to raise her hand. Assuming that Susan has no choice about whether God does this or about the fact that her decision is sufficient to bring it about that she raises her hand, it seems to follow that she has no choice about what the atoms that compose her hand do or are like. Nevertheless, she

[3] Broadly construed, agent-causal libertarianism is the view that maintains: (i) determinism is false, (ii) we have free will, and (iii) free agents are the direct causes of their actions. Moreover, as Capes points out, agent-causationists tend to think that free agents possess causal powers that enable them to bring about effects in the physical world.
[4] It's worth mentioning that this only applies to Cases 1-3, since Case 4 is indeterministic. So, we may more generally summarize Capes's cases as follows: possessing downward causal control does not imply that one has a *choice* about how that downward causal power is employed.

apparently exercises downward causal control over her atoms, insofar as her raising her hand is a causal upshot of a conscious mental property" (137).[5]

Case 2:
"Similar circumstances arise in cases of covert manipulation. We can replace God with neuroscientists who have created Susan and who directly manipulate her, thereby causing her to decide to raise (and thus to raise) her hand" (138).[6]

Case 3:
"Take [Case 2]. We can alter the case so that while the neuroscientists do not directly control her actions, they have 'programmed' her using genetic and social engineering techniques so that when she is in circumstances of a certain sort she will reason in a way that leads her to decide to raise her hand . . . Part of the experiment, we might imagine, is to find out which behavior results from which forms of neural manipulation. Here it is clear that when Susan finds herself in the relevant circumstances, she has no choice about whether she decides to raise her hand and thus no choice about what the atoms that compose her hand do or are like" (138). [7]

Case 4:
"Patrick is planning to shoot the Queen. Unknown to him, there is a diabolical demon monitoring his thought processes (diabolical demons, like nefarious neurosurgeons, can do such things), and if Patrick seriously considers not shooting the Queen, the demon will intervene and force him to (decide to) shoot her. As it happens, Patrick never seriously considers not shooting the Queen, and decides to shoot, and does shoot, her entirely on his own . . . this is a case in which an agent exercises downward control over his constituent atoms (those that compose his trigger finger) and yet lacks a choice about what those atoms do or are like" (139).[8]

The general import of these cases is this: possessing downward causal control does not imply that one has a choice about how that downward causal power is employed. For, it seems reasonable to think that free will requires having downward causal powers and a choice about how those powers are employed, and thus it is unclear how having downward causal powers alone would be sufficient for free will. With these cases and their general import in mind, I will now advance to my responses.

Responding to the cases

As Capes anticipates, Merricks could respond by questioning the coherency of Cases 1 and 2. For, if God or neuroscientists determine that Susan decides to raise and thus raise her hand, what kind of control could Susan be thought to have? It seems reasonable to question whether Susan has any control at all, since her decision was brought about by direct manipulation. Moreover, one might argue

[5] It's worth noting that Case 1 is an instance of *local determinism* in an indeterministic world.
[6] Case 2 is also an instance of local determinism in an indeterministic world.
[7] While Case 3 is also an instance of local determinism in an indeterministic world, Capes thinks that it is fundamentally different from Cases 1 and 2. This is due to the fact that the manipulation occurs 'at a distance', and thus, it is "less obvious that Susan makes no choice of her own" (Capes 138).
[8] Anticipating Merricks responding that downward control is sufficient for having a choice only in indeterministic *contexts*, Capes offers Case 4 (which is an instance of a Frankfurt-type case)—a scenario in which determinism is false and the agent is not caused to act due to forces outside of her control.

that Susan herself did not decide, but rather, that God and the neuroscientists have decided for her.[9] Moreover, Merricks might respond that local determination renders the indeterminate worlds posited by Cases 1 and 2 irrelevant; for Susan was still determined to decide to do as she did, and thus it is unclear how this does not undermine any control she might have.[10] If these lines of response are effective, then Cases 1 and 2 are unsuccessful in showing that (M2) is false.

Capes takes Case 3 to be more threatening to the truth of (M2), since the manipulation occurs "at a distance"and so it is "less obvious that Susan makes no choice of her own" (138). While covert manipulation is certainly descriptively different from direct manipulation, it's unclear how programming Susan "using genetic and social engineering techniques" would not also amount to some sort of determinism. For, if some neuroscientist N conducted distant manipulation M which lead to Susan making some decision D to perform some action A (provided the right circumstance), wouldn't it be the case that N caused M which consequently lead to D which ultimately caused A? Perhaps Capes would reply that since the circumstance that gave rise to Susan performing A was indeterministic, Case 3 still threatens the truth of (M2). While the circumstance which gave rise to Susan performing A is indeterministic, it is unclear how this is pertinent to whether Susan made a decision of her own, and more importantly, had any control in doing so. For, it seems like Susan's acting freely would have to involve indeterminacy regarding her decision making faculties, not merely the circumstance in which she performs some action. But, in Case 3 it seems like Susan's decision making faculties were not indeterministic—or at least not to the extent that agent-causalists require.

It is also possible to respond to Case 3 by pointing out that there is no relevant difference between agents in manipulation cases and ordinary agents in deterministic worlds.[11] For if Cases 1 and 2 can be diffused by appealing to the fact that determinism undermines any control an agent might have, and moreover, if there is no relevant difference between agents in manipulation cases and ordinary agents in deterministic worlds, then it is unclear how Case 3 is any different from Cases 1 and 2. If there is no relevant difference, then it seems that Case 3 fails to undermine (M2) for the same reasons Cases 1 and 2 do. If either of these responses are adequate, it seems that Case 3 fails to show that (M2) is false.[12]

Aiming to avoid the determinism complaints facing Cases 1-3, Capes offers Case 4, which posits an indeterministic scenario. One could argue, as others have, that if it is really true that Patrick cannot do otherwise in such a context, this is only due to the fact that Patrick was determined to act as he does.[13] However, I think a more effective response would be to argue that Patrick does have a choice in

[9] One could also raise a smaller issue with Case 2 by pointing out that direct manipulation of the brain would be presupposing the truth of mind-body supervience. For, if the mind does not supervene on the body, it is unclear how the neuroscientists' melding would amount to Susan coming to have the mental state of 'deciding to raise her hand'.
[10] This also seems question begging, since Capes construes Merricks as an incompatibilist.
[11] This point is a feature of Alfred Mele's *Zygote argument*. While the import of the entire argument may not be pertinent here, this particular feature of the argument is. For more on this, see Mele, (2006).
[12] A smaller complaint: similarly to Case 2, the indirect manipulation of the brain may presuppose the truth of mind-body supervience. For, it seems that the efficacy of the neuroscientists' meddling requires that Susan's downward causal powers *do* supervene on her constituent atoms (namely, those comprising her brain). However, according to Merricks, conscious mental properties—presumably, those properties including downward causal powers—do not supervene on one's constituent atoms. So, it seems that Case 3 may also be guilty of question begging, and moreover, it is unclear how the neuroscientists' meddling would have any effect on Susan's downward causal powers if they do not supervene on her constituent atoms since, presumably, the meddling could only extend to Susan's constituent brain atoms.
[13] See Widerker, (1995).

Case 4.[14] That is, Patrick has the choice to decide to shoot the queen on his own, or to choose to abstain from shooting and (obliviously) allow the demon to intervene. As it turns out (as in all Frankfurt-type cases), Patrick did decide to perform the action on his own. It seems that choosing to shoot the queen on his own implies that Patrick did have a choice—namely, whether or not his downward causal powers were in his control rather than the demon's. Given this response, it is unclear how Case 4 undermines (M2).

If my responses adequately show that Cases 1-4 are ineffective in demonstrating the falsity of (M2), then Capes's main objection to Merricks's response to the bottom-up threat fails, or is at least problematic.

Bringing Downward Causation Back Down

I will now consider an alternative objection to Merricks's response to the bottom-up threat. The essence of my worry is this: are there good reasons for thinking that human persons have downward causal powers? Recall what (M1) and (M2) claim: the use of the phrase 'in virtue of' in (M1) functions as a conditional—it indicates sufficient conditions for downward causation. With this in mind, we can reformulate (M1) as 'human persons have downward causal control over their constituent atoms if they have conscious mental properties that do not supervene on physical states'. (M2) is also a conditional statement. From both (M1) and (M2) we can construct the logical relationship between (a) 'S has conscious mental properties that do not supervene on physical states', (b) 'S has downward causal control over her constituent atoms', and (c) 'S has a choice about what her atoms do or are like'. Given that the success of the bottom-up threat rests on (c)'s denial, it seems that (c)'s truth is necessary for (d) 'S has free will'.

The logical relationships between these claims represents a chain of necessary and sufficient conditions. With this in mind, it seems reasonable to ask what is necessary and sufficient for (a)? Note that (a) makes a claim about the relationship between mental properties and physical properties. Since (a) makes a claim about the mental, it seems like some well defended theory of the mental would be necessary and sufficient for (a). Capes construes Merricks as an agent-causalist, and given that many agent-causalists endorse some sort of dualism, it seems reasonable to construe Merricks as a dualist, at least about human persons.[15] To more closely consider how this theory of mind might play a role in Merricks' overall ontology, let us consider an argument for free will that derives from Merricks' view.

(1) For some agent S, S having free will requires S having a choice about what actions she performs.
(2) S has a choice about what actions she performs if she has control over or a choice about what her constituent atoms do or are like.
(3) If S has downward causal control, then S has a choice about or control over what her constituent atoms do or are like.

[14] To see other similar responses to Frankfurt-type cases, see Robinson (2010), Naylor (1984), and van Inwagen (1978).

[15] In rejecting the supervience of the mental on the physical, Merricks tacitly implies that he endorses, or at least must endorse some theory of mind within his overall ontology. With non-reductive physicalism ruled out for Merricks—since it is typically taken to imply mind-body supervience, which he flat out rejects—he is left with the following options: (i) physicalism, (ii) eliminativism, (iii) substance dualism, and (iv) property dualism. I would suspect that Merricks would reject (i), given that problems facing physicalist theories of mind typically force physicalists into accepting non-reductive physicalism. Moreover, Merricks explicitly denies that human persons (and hence, mental properties) are eliminative—leaving (iii) and (iv) as Merricks's only palatable options. Agent-causalists often endorse versions of substance dualism—so perhaps Merricks would be open to endorsing (iii).

(4) If S has conscious mental properties that do not supervene on physical states, then S has downward causal control.
(5) S has conscious mental properties that do not supervene on S's constituent atoms (assume).
(6) So, S has downward causal powers (from 4, 5).
(7) So, S has a choice about or control over what her constituent atoms do or are like (from 3, 5).
(8) So, S has a choice about what actions she performs (from 2, 7).
(9) So, S has free will (from 1, 8).

My objection targets premise (5), for if (5) is false or ill-supported, then the argument cannot go through. Flat out rejecting (5) would certainly evoke an ad hoc criticism, so let us instead consider an argument in support of (5) that Merricks might sympathize with.

(1) If X and Y are distinct substances, then X cannot supervene on Y.
(2) The mind (or conscious mental properties) and body (physical states) are distinct substances.
(3) So, the mind does not supervene on the body.

These three premises constitute a general argument for mind-body dualism. The question, thus, is whether mind-body dualism is tenable. Historically, it has been widely criticized, typically regarding the problem of mind-body interactionism. Briefly explained, the problem of mind-body interactionism questions the coherence of the idea that an unextended, immaterial substance (mental thing) would be able to interact with extended, material substance (physical thing). Jaegwon Kim defends a version of this objection in Physicalism, or Something Near Enough. Since I have little space here, I will only briefly cash it out in informal terms.

The real problem facing substance dualism, Kim thinks, is explaining how an immaterial, unextended thing remains intimately connected with a single material, extended thing—such that they constitute a single unit or whole. Why, Kim asks, does one's immaterial, unextended mind not venture into other bodies? What prevents one's mind from causing physical effects to arise arise in another person's body? I.e., it is unclear why one individual's mind only produces physical effects in that person's body, and moreover, why there seems to be a unique and particular unity between one's mind and one's body. Regarding the general argument for mind body dualism, Kim's objection seems to question the plausibility of premise (2). For, given the worry raised by Kim, it seems that we may not have good reason for accepting (2), and thus the argument for mind-body dualism is at least problematic. There have been attempts to resolve this issue, but here it will suffice to say that there are, to say the least, serious problems with the argument supporting premise (5), so we may have good reasons for rejecting (5), and thus for rejecting the derived argument for free will.[16]

In sum, if avoiding the bottom-up threat requires endorsing mind-body dualism, then more independent argument for dualism's plausibility is needed. For, if having free will (and also blocking the bottom-up threat) requires downward causation, and if having downward causation requires endorsing mind-body dualism, then it seems like problems facing mind-body dualism may render Merricks's response to the bottom-up threat untenable. If this alternative objection is convincing, it seems like the proposal that human persons can have downward causation may be more intractable than it appeared, and moreover, that Merricks's attempt to salvage free will via downward causation may be as unpalatable as the very objection that evoked it.

[16] For responses to the above objection to mind-body dualism, see O'Connor, (2000).

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America's Schools: Separate and Unequal

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Abstract

This paper explores how various philosophers contribute to the discussion of the racial integration of public schools. I assert that racial integration is a moral necessity, and the government should create policy to ensure the successful integration of our public schools. To support this claim, I will first expand upon the context of the issue. I will then address libertarians, who would counter my thesis with a focus on the freedom of individuals. I will use utilitarian ideas to demonstrate that racially diverse public schools maximize the good in society; however, utilitarianism fails to explain what I believe is the crux of the problem. Therefore, I will draw on theories of democracy, the individual, and justice in the writings of Dewey, Kant, and Rawls to address the components of racial segregation that disrespect the inherent worth of human beings. Aristotelian ideas on what it means to be a flourishing human being will support my claim that segregated schooling is irrational, immoral, and contradicts the purpose of education. Finally, I will argue that civic virtue calls for unity and solidarity, which are vital to the optimal functioning of society and which are threatened when schools are racially separated.

America's Schools: Separate and Unequal

"There must be a recognition that we still live under a social contract in this country. In spite of the progress we have made, there are still too many people who are getting left out… We must work at the elimination of the remaining barriers that divide us as a people."
-Former Mississippi Governor William Winter

Over fifty years after the landmark *Brown v. Board of Education* decision was handed down by the Supreme Court, public schools in the United States are experiencing an alarming pattern of "resegregation," or the separation of races. The isolation of races has several consequences for students attending these schools—economically, academically, and socially. In this paper, I will argue that the perpetuation of racial segregation in the public school system is unethical and government policy should directly address the problem. To support this claim, I will explore the writings of Dewey, Kant, Rawls, Aristotle, and others to conclude that integrated public schools: (1) benefit the least advantaged; (2) are necessary to truly respect humanity; and, (3) are key to building and encouraging a unified democratic society.

According to a 2012 report by the UCLA Civil Rights Project, "80% of Latino students and 74% of black students attend majority nonwhite schools," and "the typical white student attends a school where three-quarters of their peers are white" (Orfield 2012). Minority students are more likely to attend an economically disadvantaged school: "The vast majority (79 percent) of white students attend schools where less than half the student body is poor, compared with 37 percent of black students and 36 percent of Hispanics" (Jost). Academically, students "who attend integrated schools are more likely to

score higher on mathematics achievement tests compared to those who attend racially segregated minority schools" (Mickleson 2013). Numerous studies have tried to quantify the effects of desegregation in public schools. A study in the American Economic Review suggested that desegregation during the 1970s actually reduced the dropout rate among African American students by nearly three percentage points (Guryan). Another study indicated, "…for blacks, school desegregation significantly increased educational attainment and adult earnings, reduced the probability of incarceration, and improved adult health status" (Johnson). So what occurs when resegregation begins creeping into schools? The *Quarterly Journal of Economics* asserted that the end of busing in one community in North Carolina "widened racial inequality" (Billings).

Given these facts, should the government pass policy to racially diversify public schools? Libertarians might argue that despite possible consequences of segregation the government still has no right to interfere with the free will of individuals. An example in the political sphere is Rep. Ron Paul (R-Texas). He asserted his opposition to the 1964 Civil Rights Act, claiming that the legislation "undermine[d] the concept of liberty" (Bassett). In this view, students should not be forced to participate in government-ordered integration strategies because these policies undermine the freedom of the individual. However, could the harm principle apply in this case? The harm principle states that one can only limit liberty when an individual (who is not consenting) is being harmed by another's actions (Feinberg 25). There are four main concepts of harm: offense, invasion of an interest, harm vs. hurt, and non-benefit (Feinberg 26-30). In the case of racial segregation, there seems to be a harm done to the students who are attending these schools, some of which were described earlier. Would this not be a sufficient reason for the government to intervene in these cases, in order to protect the students from suffering harms that they did not consent to or had no control over? Yet, Feinberg states, "We harm a man when we deny or deprive him of something he needs; we fail to benefit him (merely) when we deny or deprive him of some good he does not need" (Feinberg 30). The burden of proof would be on the proponent of government intervention to prove that segregated schooling actually denies the students of a need, rather than simply a good.

Because of the difficulty of proving this, most libertarians would still emphasize the importance of the freedom of the individual, and thus, deny the right of the government to intervene in public schools to ensure racial integration. Utilitarian theory, on the other hand, would offer a very different perspective on the topic. Utilitarianism focuses on maximizing the good in a society. In some cases, this means that individual preferences are less important than the "bigger picture." To decide where utilitarians fall on this issue, one must weigh the good and the suffering caused by racial segregation in schools. If schools were more diverse, several goods would be produced. Students would perform at higher levels, thus creating more knowledgeable, well-equipped citizens for the workforce and society. For example, a study published in the *Proceedings of the National Academy of Sciences* concluded, "Exposure to concentrated disadvantage in Chicago appears to have had detrimental and long-lasting consequences for black children's cognitive ability, rivaling in magnitude the effects of missing 1 year of schooling" (Sampson 852). Moreover, the inequalities present in the system would be reduced, creating utility for many students. Some suffering might be caused to racial purists by the reduction of racially segregated schools, as policies of integration run directly contrary to their beliefs. Yet, overall, the good produced by racially integrated schools far outweighs any suffering caused.

However, utilitarianism only touches on some of the problems of segregation and, in my view, leaves out an important piece of the puzzle. By only looking at the totals for both good and suffering produced, it ignores the effects of integration on an individual level. I believe Kant can contribute in some meaningful ways to understand the individual aspect of integration. Kant argued that before one seeks to pass his will, he must test the will to see if it could be universalized (Sandel 120). Let's test this

maxim in the case of racial segregation in schools: Could you will that every school be composed of only people of the same race? There are several cases in which this law could not apply. Imagine a case of the last remaining member of a race. There would be no way in which this individual could attend a school with only others from his own race. Or consider bi-racial students. Would they have to choose the race of one of their parents over the other? Because the maxim cannot be applied universally, there is something about it that lacks rationality, according to Kant.

In addition, to Kant, it would be irrational to perpetuate racial segregation. Kant strongly believed in respecting the inherent value of each human being and viewing humans as ends in and of themselves (Sandel 109). Segregated schooling does not achieve the fulfillment of this ideal. The notion that schools can remain segregated reinforces an idea that some people are inferior or less valuable than others due to their skin color. To view others as less worthy or separate from you is a contradiction in will because you are failing to see and respect the humanity in others.

Another philosophical test to use in the case of racial segregation is Rawls's veil of ignorance (Rawls 569). Imagine you are behind a veil of ignorance, meaning that you did not know anything about yourself—your race, social status, or economic wellbeing. If asked to create an ideal world in this position, a person would tend towards a society in which everyone was equal—or, at the very least, one in which even the lowest position in society would not be unbearable. In this idea of true justice, race would not be a factor. The only allowance of differences between individuals would be in cases when the differences would actually help the individuals who are struggling the most (Rawls 571). Thus, racial isolation is contrary to the equality that anyone behind a veil of ignorance would promote.

Rawls's political conception of justice can also contribute to this discussion. Rawls notes that "fair opportunities for all citizens (especially in education and training)" are key in societies that embrace this conception of justice (Wenar 4). Segregated school systems do not provide these fair opportunities of which Rawls speaks, especially as the disparities between majority minority schools and overwhelmingly white schools continues to widen. These disparities have tangible results: the national average ACT score in 2012 for African American students was 17.0, compared to 22.4 for white students ("National Score Trends").

John Dewey, drawing on many of the already mentioned philosophers, directly addressed the importance of education in his writings. His ideas on a democratic society further strengthen the argument in favor of integrating education systems. Dewey wrote, "Belief in the common man is a familiar article in the democratic creed. That belief is without basis and significance save as it means faith in the potentialities of human nature as that nature is exhibited in every human being irrespective of race, color, sex, birth, family, of material or cultural wealth" (Creative Democracy 341). He also asserts that one of the primary goals of education is to prepare people "for intelligent organization, so that they can unite with each other in a common struggle against poverty, disease, ignorance, credulity, and low standards of appreciation and enjoyment" (Stack 21). Education is a cornerstone of democracy and allows individuals to understand the need to work together in creative ways to combat the aforementioned plagues on our nation. Discrimination based on race is "treason to the democratic way of life" and serves as only a barrier to creating the unity necessary for a democracy to properly function (Creative Democracy 342).

Dewey touches on what I believe to be the most important aspect of the debate: the idea of community. One of the most devastating effects of segregated schools is the fostering of apathy or prejudice towards the "other group." A report by the National Academy of Education concluded, "The weight of the research evidence supports the conclusion that there are long-term benefits of desegregation in elementary and secondary schools. Under some circumstances and over the long term,

experience in desegregated schools increases the likelihood of greater tolerance and better intergroup relations among adults of different racial groups" (Linn 2). When students are racially separated, homogenous communities are fostered, which lead to feelings of exclusivity. If the feeling of solidarity within a town or country is missing, then people lose any sense of shared responsibility toward common goals. Not only does this fail to prepare students for encounters with diversity in the real world, but it also creates a dangerous "us vs. them" mentality. As these divides deepen across the United States, the individual towns "cannot rightly be called *a* city, but many. They are at war with themselves, and thereby undermine their own potential" (Weber).

In segregated schooling, a sense of shared responsibility fades, as people begin to see those who are different from them as the "out group." Dewey writes, "We shall foster habits of group loyalty, feelings of solidarity, which shall bind us together by such close ties that no social group which has not cultivated like feelings through caring for all its members, will be able to withstand us" (Evolution and Ethics 327). There are evolutionary benefits to caring for others. A loss of unity threatens our democratic institutions and our capacity to truly care about the human beings who inhabit the same world as us.

Many of these ideas are deeply Aristotelian. Aristotle believed that for a city to prosper, there must be successful political interaction, for we are political animals (Skultety). These interactions can only happen in a place where everyone is involved in the political process. In Aristotle's ideal city, every individual is political; to deny others to be active in politics is to encourage people to not be rational.

How does this translate into the education system? Minority schools tend to also be economically disadvantaged schools (Jost). With lower levels of resources available to the schools, they often struggle to adequately prepare their students for post-graduation, whether that path involves post-secondary education or an immediate entry into the workforce. This leaves an entire group of the population struggling to fully participate in society after high school graduation—if they even reach that point. To be a political citizen, education is key. When education is lacking, then society is failing to encourage human beings to flourish.

Aristotle also strongly believed in the importance of habits in forming and refining certain virtuous characteristics (LaFollette 48). In Aristotle's views, one must feel emotions in an appropriate way and be able to articulate those feelings in a comprehensive manner. When differences arise in the expression of these emotions, it is due to improper habits. If you ignore the importance of education, then you are undervaluing peoples' habits, which are often developed in the school setting. Proper habits—which stem from a proper education—lead to individual's ability to land on the golden mean, or the ideal between two extremes (LaFollette 50).

Modern philosophers have also contributed to the discussion over integration in public schools. Elizabeth Anderson, the John Rawls Collegiate Professor of Philosophy at the University of Michigan, Ann Arbor, argues that racial segregation is a fundamental cause of social inequality, and thus, integration is a moral imperative. In her book, The Imperative of Integration, she asserts, "…integration of racial, ethnic, and other groups that mark significant lines of social inequality is a vital ideal for a democratic society, necessary for its basic institutions to function successfully" (Anderson, Preface X). She argues that there has been a shift "from socioeconomic equality to equality of respect and esteem for identities and cultures," which creates a myth that a society can be separated along racial lines, yet still fulfill the goals of equality (Anderson).

Derrick Bell, a NAACP Legal Defense Fund Lawyer, counters that racial integration is not of vital importance; instead, policy should work to improve schools, regardless of racial diversity ("Brown v. Board of Education and the Interest-Convergence Dilemma" 518). He promotes the idea that segregated

schools can still function effectively and be successful in preparing students for post-graduation college or career paths. I think these conclusions stem from what Bell believes to be a realistic assessment of the current state of race relations in the United States. While perhaps not ideal, segregated schools can still provide a great education to students, he argues. In essence, it seems Bell is resisting this tendency to draw on lofty, idealistic notions about how the world should be, and rather, focuses on how the world actually is. His view that the *Brown* decision failed to create this promised integrated education system leads him to conclude that the courts should have emphasized that schools be equal, but not necessarily integrated (*Silent Covenants*).

Yet, research repeatedly has shown that integrated classrooms tend to yield higher results. A study conducted by the National Academy of Education's Committee on Social Science Research Evidence on Racial Diversity in Schools concluded, "Racial diversity per se does not guarantee such positive outcomes, but it provides the necessary conditions under which other educational policies can facilitate improved academic achievement, improved intergroup relations, and positive long-term outcomes" (Linn 3). The report argues that diverse school environments are necessary conditions to reach the goal of truly successful schools. To take a line directly from the *Brown v. Board* decision: "…in the field of public education, the doctrine of 'separate but equal' has no place. Separate educational facilities are inherently unequal" (*Brown v. Board of Education*).

Then, how can we reconcile these ideas with seemingly successful examples, such as KIPP schools, that are majority minority schools? First, I would assert that these cases are anomalies, and their success stems from the resources the schools have due to their status as charter schools. But, more importantly, I believe that this argument, along with Bell's assessment of the problem and his proposed solutions, fails to adequately address what the purpose of education is and what it means for a school to be successful. Are test scores the only indicator of a school's achievements? Although we live in the age of standardized testing, I would say no. A school's success can be measured in other, perhaps more subtle ways, such as the societal contributions its graduates make. While KIPP students might score well on state tests, does this mean they have been able to interact in meaningful ways with a diverse set of peers?

It is difficult to concisely identify the purpose of education. Yet, I think Janet W. Schofield, a professor of psychology at the University of Pittsburg, nicely sums it up: "Education in a democratic society serves three basic purposes. It provides students with workforce skills, prepares them to function as thoughtful and informed citizens in a cohesive country and enriches their lives by awakening them to new knowledge, perspectives and possibilities" (Jost). A school should not only seek for its students to achieve high test scores. Instead, it should instill certain values in students, one of which must be racial harmony and inclusion. In segregated schools, this value is absent and forgotten. In addition, students confined to interactions with people of their own race will be unprepared to enter work environments that contain people from various races and diverse backgrounds. They may react negatively to these new encounters, or simply be ill equipped to socially interact with people who are different from themselves. More significantly, they may be lacking in awareness of and respect for other cultures or backgrounds because they were not exposed to them as a child.

Our country can never reach its full potential if we continue to allow our children to be separated based on race. Former Governor of Mississippi William Winter, in a 2004 speech at George Washington University, referenced this lack of adequate results:

> "…But now fifty years after Brown we still have not overcome the difficulties of the past. Across the South there remain too many underfunded and ill-managed schools, which are not producing satisfactory results. When we permit this to happen, we are killing the dream that so

> many have had of a society where nobody gets left out…That remains a major challenge that still faces us today, and until and unless we solve it we shall fall short as a competitive nation in the future" (Winter 125).

We cannot continue to allow the color of someone's skin to be a barrier to success in life. If we do, we will fail to advance on a global scale.

But quantitative statistics fail to capture the full picture of harm that results from racially segregated schools. We cannot expect to prosper as a nation if we are promoting the distinction between groups of people from a very young age. The strong sense of community that is vital to our nation's strength is lost as we continue to allow students to grow up separated and isolated, "on the other side of the tracks." The *Brown* decision was a valiant attempt to remedy this plague on our nation. But it was not enough, and its effects are being reversed across the country every day due to changes in policy, legislation, and court cases. As one report notes, "There is a substantial amount of inequality that cannot be remedied because the court refuses to acknowledge structural inequality and the continuing effects of past discrimination" (Powell 177). The government must intervene to ensure that America's children attend school together, in diverse, accepting environments that teach them the inherent value that every person, regardless of race, socioeconomic status, or background, has to offer the world.

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Knowledge, Language, and Nonexistent Entities

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Abstract

In this paper, I apply the necessary conditions for knowledge to three different theories within the philosophy of language and argue that only one of the three stands up to a problem of knowledge involving nonexistent entities. I begin by briefly covering three commonly held necessary conditions for knowledge of which I focus mostly on the condition that a proposition must be true in order to know it. Then I consider theories of language given by Russell, Strawson, and Salmon. To each theory, I test whether the theory can make sense of a person knowing a proposition such as "Sherlock Holmes is a detective," which includes a nonexistent entity as the subject. Based on their theories of language, I show that neither Russell nor Strawson are able to make sense of such sentences without either a concession in their respective theories or in their epistemology. Of the theories considered, only Salmon's is able to adequately analyze sentences that have nonexistent entities as their subject. By doing this I show a relationship between the philosophy of language and epistemology, and I show how holding to a theory in one may force one to claim that a theory in the other is false.

Knowledge, Language, and Nonexistent Entities

In this paper, I apply the necessary conditions for knowledge to three different theories within the philosophy of language and argue that only one of the three stands up to a problem of knowledge involving nonexistent entities. I begin by briefly covering three commonly held necessary conditions for knowledge of which I focus mostly on the condition that a proposition must be true in order to know it. Then I consider theories of language given by Russell, Strawson, and Salmon. To each theory, I test whether the theory can make sense of a person knowing a proposition such as "Sherlock Holmes is a detective," which includes a nonexistent entity as the subject. Based on their theories of language, I show that neither Russell nor Strawson are able to make sense of such sentences without either a concession in their respective theories or in their epistemology. Of the theories considered, only Salmon's is able to adequately analyze sentences that have nonexistent entities as their subject. By doing this I show a relationship between the philosophy of language and epistemology, and I show how holding to a theory in one may force one to claim that a theory in the other is false.

To begin, let's look at what the conditions are that make up knowledge. According to Ayer, the necessary and sufficient conditions for some subject S knowing some proposition P are (i) P is true, (ii) S believes that P is true, and (iii) S has the right to be sure that P is true. Condition (iii) simply means that S is justified in believing that P is true (Ayer 442). Gettier shows that Ayer's conditions are not sufficient for knowledge through his use of "Gettier Cases," and these cases leave the third condition uncertain and controversial (Gettier 444-446). However, the first two conditions remain generally accepted. Thus, if S knows that P, then P is true, and S believes that P is true.

For the purposes of this paper, I will only look at the first condition: If S knows that P, then P is true. This will form the basis of the test that I will use on the different theories in the philosophy of language. In particular, I will consider cases where P is a proposition that has a subject that does not

refer to anything in the real world. Such subjects include Sherlock Holmes, a phoenix, and the present king of France. The first theory I will consider is the one formulated by Bertrand Russell in his essay "On Denoting."

Consider the following sentence:

(1) The present king of France is bald.

According to Russell, this sentence translates into three statements: (i) Something is presently a king of France; (ii) At most, one thing is presently a king of France; (iii) Whatever is presently a king of France is bald (Russell 232). The first two statements work to handle the "the" in the sentence. Russell claims that the "the" in the subject works to refer to one single thing in the world. To him, this means that in order to account for the "the" in his translation, statement (i) must be used to state that at least one thing exists that is presently a king of France. Statement (ii), then, states that no more than one thing exists that is presently a king of France. Finally, statement (iii) states that whatever the thing is that is denoted or referred to by the first two statements, that thing is bald.

Before we analyze sentence (1) to determine its truth-value, let's first look at a simpler example. Take the following sentence: "The Huntington University mascot is a lumberjack." Russell would analyze this sentence to make the following statements: (i) Something is presently a Huntington University mascot; (ii) At most, one thing is a Huntington University mascot; (iii) Whatever is presently a Huntington University mascot is a lumberjack. Now, according to Russell, the truth-value of the original sentence is determined by the truth-values of the translated statements. So in our mascot example, (i) is true because there is at least one Huntington University mascot. Statement (ii) is true because there is only one Huntington University mascot. Finally, (iii) is true because Huntington University's mascot is, in fact, a lumberjack.

Now that we have determined the truth-value for the sentence in the simpler example, let's return to the present king of France. In this example, it turns out that (i) is false because there is no present king of France. France is no longer a monarchy; therefore, it does not have a king. This means that sentence (1) as a whole is false. It does not matter if the other two statements are true; if even just one of them is false, the original sentence is false. This is because the statements (i), (ii), and (iii) are conjoined to make the original sentence. In other words, sentence (1) is true if and only if (i) is true, (ii) is true, and (iii) is true.

A problem arises, however, when the original sentence contains a subject that does not refer to anything. Consider the negation of sentence (1):

(1-) The present king of France is not bald.

Due to the Law of Excluded Middle, either a sentence or its negation must be true. Thus, either sentence (1) or sentence (1-) must be true. We already know that sentence (1) is false, so according to the Law of Excluded Middle, sentence (1-) must be true. Let's check. Using Russell's method, Sentence (1-) breaks down to the statements: (i) Something is presently a king of France; (ii) At most, one thing is presently a king of France; (iii) Whatever is a king of France is not bald. After analyzing sentence (1-) in this way, it turns out that the sentence is false because, once again, there is no present king of France. Thus, both (1) and (1-) are false, but this violates the Law of Excluded Middle. Therefore, it would appear that something is wrong with Russell's analysis of the sentences (233).

Russell recognized this problem and explained that it arises due to a misunderstanding of the scope of the negation. He explains that there are two ways of understanding how sentence (1-) should be formulated. It should either be formulated as "The present king of France is not bald" or "It is not the case that the present king of France is bald." He says that in the first formulation, "The

present king of France" is primary, and all sentences where a non-referring subject is primary are false. In the second formulation, "The present king of France" is secondary (Russell 236). This means that the main part, "The present king of France is bald," is evaluated as usual. Then, the "It is not the case that" part changes the truth value of the sentence to the opposite of the main part. Thus, the main part is evaluated to be false, and the negation makes the sentence as a whole true. Under this conception of negation, Russell's theory does not violate the Law of Excluded Middle.

Now, let's see how Russell's theory stands up to the knowledge test we devised above. According to the test, if S knows that P, then P is true. We will use the following proposition for this test:

(P1) The Minotaur is half man and half bull.

Now, let's say that Jones knows that (P1). In other words, Jones knows that the Minotaur is half man and half bull. Using Russell's theory, (P1) translates into the statements: (i) Something is a Minotaur; (ii) At most, one thing is a Minotaur; (iii) Whatever is a Minotaur is half man and half bull. Once again, statement (i) renders this proposition false because there is no Minotaur. Thus because (P1) is false, it must be false that Jones knows that (P1). Proposition (P1) simply states the definition of the Minotaur, though. It is the very definition of the Minotaur to be a creature that is half man and half bull. It seems that not only should (P1) be true, but Jones should be able to know the definition of the Minotaur. Furthermore, if we evaluate the negation of (P1), then the proposition "It is not the case that the Minotaur is half man and half bull" would be true and knowable to Jones. This also seems wrong, though, because it would then be knowable that the Minotaur is not that which it is.

Strawson responds to Russell in his paper "On Referring" and states that Russell's understanding of sentence (1) is off the mark. According to Strawson, if someone were to presently make the statement "The present king of France is bald," one's reaction would not be to say that this sentence is false, but rather that there is no present king of France. The assertion that there is no present king of France does not contradict the statement that the present king of France is bald, nor does the assertion claim that the statement is false. The statement simply states that the truth or falsity of (1) does not even arise (Strawson 252).

Strawson makes the distinction between the sentence itself, the use of a sentence, and the utterance of a sentence. He claims that Russell's mistake is that he claimed that sentences can be either true or false. Strawson denies this and claims that only the uses of sentences make true or false propositions. For example, Strawson would say that the sentence "The present king of France is bald" has no truth-value in and of itself. If Jones were to utter this sentence sometime in the past when France had a bald king, then his use of this sentence would form a true proposition. If Jones were to utter this sentence in the present day when there was not king of France, then his use of this sentence would form a false proposition (Strawson 249).

He connects this distinction to a distinction between an expression, a use of an expression, and an utterance of an expression. An expression in this case is simply the subject of a sentence. The connection is not perfect due to the fact that just the use of the expression "The present king of France" does not have a truth-value in and of itself. The use of an expression, however, does refer to something. Like a sentence itself not having a truth-value, an expression itself does not refer to anything. Only the use of an expression refers to something. Thus, when Jones says "The present king of France is bald" when there is no king of France, one does not say that the proposition is true or false because propositions are only true or false when the expressions that make them up actually refer to something (Strawson 249-252).

Now that we have a basic idea of Strawson's theory, let's apply it to the knowledge test. We shall use (P1) again in order to test the theory, so Jones knows that the Minotaur is half man and half bull. As has been explained above, it seems correct to say that Jones can actually know this since the

proposition simply tells what the Minotaur is. However, when we apply Strawson's analysis of the proposition, it turns out that the proposition is neither true nor false. In fact, this does not even meet the requirements to be a proposition. A proposition must be either true or false, but according to Strawson's theory, a proposition is only true or false when the expressions that make them up actually refer to something. The expression "The Minotaur" does not refer to anything because the Minotaur does not exist. Thus, according to Strawson, any sentence that contains the expression "The Minotaur" cannot be a proposition, and therefore, cannot have a truth value.

We have now gone over both Russell's and Strawson's theories of reference, and neither of them passed the knowledge test. Russell's theory is incompatible with the standard view of a necessary condition for knowledge, specifically that in order to know a proposition, that proposition must be true. Likewise, Strawson's theory is also incompatible with this necessary condition for knowledge, but his incompatibility is slightly different.

Russell has two options for resolving this problem. First, he can claim that the statement "Something is a Minotaur" is actually true. By doing this, he will be claiming that there is something out there that is a Minotaur. This would give the Minotaur a sort of ontological status. Whether it is some sort of fictional existence or actual existence, the Minotaur would gain existence of some sort, and thus, would gain some sort of ontological status. This will likely not be pleasing to him. Russell's second option is to embrace the fact that we are able to know false propositions. If this is the case, though, then there would be no reason for me to say that I cannot know that 2 + 2 = 7. As long as I believe it, I can produce some sort of justification, and I can meet whatever other requirements there may be for knowledge, it seems that I can know that 2 + 2 = 7. At the very least, the fact that the proposition is not true cannot be a reason for my not knowing it. Also, if there are no other requirements for knowledge, this seems to bring knowledge down to mere strong belief. Of the two alternatives, the first appears to be less problematic overall.

Strawson also has two options for resolving his theory's incompatibility with knowledge. First, like Russell, Strawson can admit that the Minotaur actually refers to something. Once again, this would give the Minotaur some sort of ontological status, which is a result that Strawson probably would not find preferable either. Strawson's second option is also like Russell's, only with a slight modification. While Strawson would have to deny that in order to know a proposition, it must be true, he does not have to embrace the idea that we are able to know false propositions. Instead, he can claim that knowable propositions must be non-false. This would include both true propositions and propositions that are neither true nor false. Out of the two options that Strawson has, the second one would be preferable for him.

Now that we have covered the theories of reference that have been developed by Russell and Strawson, let's look briefly at one more theory: the one developed by Nathan Salmon. In his essay, "Nonexistence," Salmon, like Russell, takes the stance that the use of a term as the subject of a proposition implies the existence of whatever it is that the term refers to. For example, consider the following sentence:

(2) Sherlock Holmes is a detective.

If this sentence is true, then the referent of "Sherlock Holmes" exists in some way. Unlike Russell, however, Salmon would evaluate this proposition to be true. According to him, when Conan Doyle wrote the Sherlock Holmes stories, he created an abstract artifact that, according to the stories, is a man named "Sherlock Holmes" (Salmon 300). Thus, sentence (2) should be understood as saying:

(2*) In the stories, Sherlock Holmes is a detective.

This invokes the world of the fiction to fix a referent for "Sherlock Holmes."

Salmon further explains that there are four kinds of names that are considered to be non-referring. These are names that apply to future, past, possible, and impossible entities; names that refer to fictional entities; names that refer to mythical entities; and names that are thoroughly non-referring. Of these, only the names that are thoroughly non-referring do not refer to anything. The example of this that he gives is "Nappy," the name for the actual present emperor of France (Salmon 306). Nappy does not exist at any point in reality, in fiction, or in myth. Nappy simply does not exist. Consider the following sentence:

(3) Nappy does not exist.

How could (3) be true, if "Nappy" truly does not refer to anything?

Salmon appeals to Gappy Proposition Theory to explain sentence (3). Gappy Proposition Theory translates propositions to the following form <Subject's Semantic Content, Property held by the Subject>. Assuming existence to be a property that can be held by something, (3) would be translated as "<___, exists> is untrue" (Salmon 310). "___" is the subject's semantic content because the name Nappy does not refer to anything, and this means that Nappy has no semantic content.

Now let's see if Salmon's theory passes the knowledge test. We will assume that Jones knows that Nappy does not exist. Because it is proposition (3) that Jones knows, we would translate this as we did above to the proposition "<___, exists> is untrue." It is the nature of gappy propositions to always be false. Thus, when the gappy proposition is negated, a true proposition is formed. Therefore, proposition (3) is true, and Jones is able to know it.

As another example of Salmon's theory passing the knowledge test, let's assume that Jones knows that Sherlock Holmes is a detective. As I have already stated above, the proposition "Sherlock Holmes is a detective" translates into the proposition "In the fiction, Sherlock Holmes is a detective." It is true that in the Sherlock Holmes fiction, Holmes is a detective. In other words, in the stories and in the fictional world that the stories constitute, the name "Sherlock Holmes" does refer to something, and the thing that the name refers to is a detective. Thus the proposition is true, and Jones is able to know it.

Salmon's theory on nonexistent entities best handles the knowledge test that we devised above. Because his theory grants a type of existence to most nonreferential names, the names do end up referring to some sort of abstract entity. This allows propositions about nonexistent entities to be true, which gives people the ability to know them.

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Fortunately, We May Not Have Time

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Abstract

Our perceptions and beliefs about reality do not always reflect the true nature of reality. Conceptions of time are one example of this. Many of us intuitively feel that time is its own distinct and external entity that somehow drives life forward. It may be natural to feel time in this way, as we experience regular cycles and seasons as we age, but we must make a conscious effort to recognize that this feeling is only a perspective of reality and not necessarily reality itself. So, are hours or years inherently real and do they pass by as we perceive? Nagarjuna and Dogen help us to understand that time does not exist inherently, but is a set of relations among phenomena, and that our being is in unity with time. This understanding contributes to living mindfully and compassionately, and offers insight into the connectedness of all things. This essay will also briefly discuss how this view of time is related to discoveries in physics as well as questions of psychology concerning memory. We find that our usual conceptions of time can be useful at a conventional level, but we should understand that ultimately and fundamentally, time is empty (of substance).

Fortunately, We May Not Have Time

"Without a foundation in the conventional truth, the significance of the ultimate cannot be taught. Without understanding the significance of the ultimate, liberation is not achieved". – Nagarjuna

Often we have the perception that time passes quickly or slowly, depending on what type of situation we are in and whether we enjoy it. We recognize that this is an illusion, but otherwise we tend to take time for granted and don't question its nature or whether it is something that is real. It appears to be something that exists in the universe as a sort of distinct entity that drives everything forward. At least, that is the sense we use in our language to speak of it. It feels strictly linear - the past is done and fixed, the present malleable, the future open. What we don't understand is that these are simply perspectives, frames of reference from which we tend to operate. By coming to acknowledge that the nature of time is emptiness, like all else, we can gain insight into the unity or interconnectedness of our own nature and accordingly become better practitioners of mindfulness and compassion.

Our usual understanding of time, so engrained in our thinking and language, is overwhelmingly demonstrated through our speech. Conversation typically involves what we are doing, what we have done, what we will do. To explain these, we make use of grammatical distinctions between the past, present, and future - categories under which every verb inevitably falls. Our understanding of time is also heard in the way we speak of time itself. We say time passes too quickly or drags on, that we do or do not 'have' some time, that we can make it or use it or spend it, give or take time, dedicate it and share it, and so on. Such speech indicates that we view time as an entity which exists externally from what we feel to be our inner selves. This distinction between one's self and one's time leads to the belief that one exists both apart from and in time, as if swimming in water but being essentially different from the water (Loy 40-41).

Such conceptions of time are influenced by experiences of time, and vice versa - experiences of time are influenced by these conceptions. On the one hand, the experience of time is natural and very basic to our experience of life. Our bodies undergo a daily circadian cycle as the earth rotates around the sun, and we see many changes as we age. It seems natural that our thinking and language would incorporate these experiences by designating categories (or tenses) of time to include past, present, and future as well as units like hours, days, years, etc. We must be careful though. The first lines of the Dhammapada say, "All experience is preceded by mind, led by mind, made by mind" (Fronsdal 1). Considering this, our designations and categories of time also lead to particular ways of experiencing time, separating us from the experience of time as it really is and ultimately leading to delusion and duhkha (translated as suffering, or dissatisfaction) (Loy - 'self' is duhkha). We begin to think that an hour is something that we possess or that passes by us, and we become selfishly possessive of 'our' time, and worry that 'my' time will end in my death (Loy 38). This kind of thought is reinforced by (and reinforces) essentialist views of the self, since then the self can indeed be something essentially different and separate from its surroundings ('swimming in water').

It becomes clear that understanding the nature of time and understanding our own nature are closely intertwined. If we hope to understand our nature, we find that we must understand the nature of time and ultimately, of all reality. Dogen, the famous Japanese Zen master, addresses the misconceptions of time and offers insight in his essay *The Time-Being*. Immediately and all throughout the writing, he emphasizes that "time itself is being, and all being is time" (Dogen 76). The two are inseparable. He urges, "Do not think that time merely flies away. Do not see flying away as the only function of time. If time merely flies away, you would be separate from time. The reason you do not clearly understand the time-being is that you think of time only as passing" (Dogen 78).

Dogen's non-dual perspective is grounded in Nagarjuna's insight into the two truths of reality, dependent origination and emptiness, as well as his examination of time based on the two truths. The first chapter of *Mulamadhyamakakarika* establishes that phenomena are empty of any essence and do not inherently exist in causes (Garfield 4-5). Causes are thought to come in order before effects – and effects somehow emerge from causes, as if existing in them. What if we apply this thought to time? What we find is that past, present, and future do not exist in themselves as entities, just as causes and effects do not inherently exist – and, how effects do not exist inherently in causes. "If the present and the future depend on the past, then the present and the future would have existed in the past" (Garfield 50). This is clearly a problem - the present and the future do not exist simultaneously in time with the past. Nor can the parts of time exist independently from one another - the very experience and definition of time involve the ordering of events in relation to one another. For example, if there are no past and future, it is meaningless to speak of a reified present (since present is what comes between past and future). "So either the present is in the past, in which case it is nonexistent, or it is independent of the past and the future, in which case it is nonexistent" (Garfield 256).

Another problem with viewing time as an entity is that an entity either changes or doesn't change. If time itself changes, then there must be some "super-time in which that change occurs" (Garfield 256) (an infinite regress would follow). If time as an entity is static, then all three parts of time must somehow exist simultaneously. We cannot think of time as an entity - but again it must depend on some 'other' entity for its existence. "If time depends on an entity, then without an entity how could time exist? There is no existent entity. So how can time exist?" (Garfield 256) Garfield offers a most precise explanation and conclusion to Nagarjuna's argument:

> But this final verse...contains Nagarjuna's positive account of the nature of time.
> Nagarjuna points out that with no entities to be temporally related, there is no time.

> That is, the only mode of existence that time has is as a set of relations among empirical phenomena. Apart from these phenomena and those relations, there is no time. But that means that, given the lack of inherent existence of phenomena, there can be no inherent existence of time. Time is thus merely a dependent set of relations, not an entity in its own right, and certainly not the inherently existent vessel of existence it might appear to be. (Garfield 257)

Once we have a strong grasp on Nagarjuna's insight, we can understand more clearly Dogen's analysis of the nature of being and time as a time-being unity. Time relies on being for existence, as Nagarjuna showed, and Dogen also sees the other side of this coin, that being relies on time for existence. "Mountains are time. Oceans are time. If they were not time, there would be no mountains or oceans...If time is annihilated, mountains and oceans are annihilated" (Dogen 81). Another expression of it could be, "No time, no things" (David Loy - Zen teacher and author - 42). It is true for everything, people included.

Loy, in *Money, Sex, War, Karma*, provides examples to demonstrate our relationship to time. He demonstrates that our understanding of time relies on relational perspective by using the analogy of an island amidst a sea. The island, standing stationary, would be a reference point from which to measure the movement of the current flowing by. The island is our usual sense of self. If there is no unmoving island, though, the movement of current cannot be measured. In the analogy, we are floating on a dinghy with the current, and thereby have no contrasting perspective from which to see time in the way we usually think we do. We flow with time - we are time. So, our measurements cannot be much more than artificial and relative.

Wittgenstein's quote from Philosophical Investigations can provide perspective as well:

> You surely know what 'It is 5 o'clock here' means; so you also know what 'It's 5 o'clock on the sun' means. It means simply that it is just the same there as it is here when it is 5 o'clock.

This is absurd, of course. What we understand to be 5 o'clock depends on our perspective of the sun from earth and the system of divisions we've designated to the sun's apparent motion. Then we can't really say that there is such a unit as an hour in the universe apart from the unit of time which we have designated to be an hour (since time must be a measure of event or change - here, earth's rotation around sun). There is ultimately no hour to be possessed or to pass by.

This perspective of time and our relationship with it should have some impact on our attitudes and behaviors. Gaining insight contributes to the first step of the eight fold path - when a right view of time is developed, right intentions naturally follow. The consideration of time may be one of the best examples of the relationship between right view and right intention. Steve Hagen, Founder of Dharma Field Zen Center in Minneapolis, explains right intention as "simply the intention to come back to this moment" (Hagen 73). Insight into what the present moment is guides one to understand how not to become entangled with regrets or anticipations, or any other emotional experiences grounded in the usual understanding of time. The right intention toward time is not leaning into the past or the future, or trying to use time as a means to some goal. Instead, our practice in mindfulness will improve because we are able to experience time just as it is: empty (that is, without essence or independent existence).

When we engage in mindful practice, we can become liberated from the duhkha produced by living with the view of an essential self. If the self is sensed as something separate from time, there can be the belief that the self is trapped in time and time leads to death of the self. This thought produces some existential anxiety, but acknowledging that there never was a self to begin with brings the

understanding that there is no self to die. Nor should we feel distress about time. Since we are time, we are not trapped by an external time entity, and do not need to shape the idea of time such that we extend to time-eternity the existence of our reified selves, to make us feel more 'real' (Loy 38). In a way, by letting go of an essentialist view of self and of eternal life, we find that eternal life is 'returned' to us. Loy quotes Wittgenstein: "If we take eternity to mean not infinite temporal duration but timelessness, then eternal life belongs to those who live in the present" (Loy 41). Practicing mindfulness with the right intention of being awake to the present moment liberates us to experience eternity in this understanding. We are also able to cultivate compassion through our practice, with a clearer vision of the connectedness of all being.

Although not intuitive, this view of time seems to be realistic on a physical level, especially as it is increasingly supported by what physicists continue to find. Ferenc Krausz is a physicist who has used laser pulses to measure the shortest time span yet measured, 100 attoseconds. For perspective, comparing 100 attoseconds to one second is like comparing one second to 300 million years. Beyond that, there is the Planck time (much briefer even than the attosecond), said to be the smallest unit of time with any physical meaning. After that, some speculate, "It may be that the best way to think about quantum reality is to give up the notion of time—that the fundamental description of the universe must be timeless" (Folger). The time we experience on a large scale may emerge from an ultimate or fundamental reality that is timeless. Nagarjuna's two truths - the ultimate reality of emptiness, and the conventional reality of dependent origination - are apparent in this thought, perhaps supporting the Buddhist perspective of time.

The perspective of time supported by research in physics should also raise questions in psychology. For example, if the past is only an illusion and not a distinct time nor fundamentally real, of what use is memory? Anterograde amnesia, the inability to form new lasting memories, may seem just as appropriate for living - one would certainly be coerced to live in the present. Clive Wearing, who suffered severe anterograde amnesia, indeed felt in every moment that he had been awakened, that until that point he had not been conscious. He recorded it as such in his journal, crossing out every previous entry upon making a new one. Buddhism suggests that we should live in such a way that we are being awakened anew or reincarnated in each moment, but could Wearing be said to have been experiencing enlightenment? It seems doubtful that one could be mindful every moment if one is incessantly shocked at a feeling of literally being awakened from unconsciousness. I think memory helps us to understand the nature of reality consciously by allowing us to establish connections between events. It seems impossible to think that dependent origination could be consciously understood if one could not make a recollection long enough to realize that certain conditions had given rise to an event. Instead, one would be stuck on an island of time where there is not even a current to measure, and understanding the nature of time at any level would seem out of reach. Nagarjuna says, "Without a foundation in the conventional truth, the significance of the ultimate cannot be taught. Without understanding the significance of the ultimate, liberation is not achieved" (Garfield 298). Memory may be double-edged. On the one hand it allows us to create delusions of time and to feel that the past and future are inherently real, and on the other hand it might be a vehicle to conscious understanding of the conventional or relative reality of time, and ultimately to experiencing awakening and liberation in the knowledge of time's emptiness.

Understanding the true nature of time does not mean that we must abandon the idea of a clock. Seeing time as we usually do can be of use on a practical, macroscopic level. Time is 'real' at the level of experience, or dependent origination - but it does not exist apart from the relationship of phenomena, none of which inherently exist either. So it is the same as everything else, dependent and empty. So we must take caution not to be led into the delusion that the clock measures something that is

fundamentally real and hovering around and apart from our being. Here is a comment from the National Institute of Standards and Technology: “Our clocks do not measure time...No, time is defined to be what our clocks measure” (Folger). Defined, that is, in conventional terms. Avoiding confusion between the reality of the dependently arisen and of emptiness will give insight into the nature of time and of being, or more accurately, into the unity of time and being. Seeing such, we can practice the mindfulness and compassion that guide beings to liberation.

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On the Logic of Evolution and the Vanity of Scientism

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Abstract

The cultural debate about Creationism *contra* evolution by natural selection may be far from over, but the logic underlying it is settled. Creationism is ill-suited to take the place of methodological naturalism for the investigation of biology. In this paper, I survey how philosopher Elliott Sober uses some well-formed concepts from statistics and epistemology, including the nature of evidence, data, as well as the contemporary theory of evolution by natural selection to destroy Creationism as a viable theory once and for all. Creationism is a demonstrable logical fallacy, one that has no support biblically, or in science, but is a thoroughly political conception. I also challenge the idea that disproving Creationism means that the nature of ultimate reality is described by ontological physicalism. I argue contemporary empiricists are mistaken about the significance of the logical defeat of the erroneous system of Creationism, and that the ontological statements about unknowable facets of existence made by materialists about reality are not obviously the case. Due to the indispensability of numbers in instantiating empirical theories, I argue that numbers are quasi-Platonic abstract entities that transcend space-time. I argue that the elements of numbers are not invented, but discovered by the human mind, and are not reducible to psychological factors.

On the Logic of Evolution and Vanity of Scientism

In Elliott Sober's numerous works on the philosophy of biology, he unpacks the question of the theory of evolution by explicating the contemporary version of the theory, as well as the well-formed probabilistic epistemology used to ground its findings. In order to distinguish the theory of evolution by natural selection from possible competitors, Sober contrasts evolution against the creationist's Intelligent Design hypothesis. Simply stated, the theory of evolution by natural selection is *better supported* by *actual* scientific *evidence* found in the world. The theory of evolution by natural selection's hypothesis (along with compelling auxiliary information and sound background theory) consistently obtains high degrees of predictive success in experimentation (Sober, 2000). The theory of evolution by natural selection has the ability to generate novel research results, which allow for emergent and bifurcating research programs into the natural world, without recourse to transcendental deductions, holy writ, social sciences, or literary history (Sober, 2000). This state-of-affairs is the hallmark of actual scientific praxis, not one *iota* of which creationists have been able to provide. Creationism has never been able to generate a single novel prediction; it has no research project apart from apologetics, doxology, and hermeneutics (Sober, 2000). Most importantly; the theory of Intelligent Design never advances, it is the paradigmatic picture of utter conceptual stagnation. Creationism never breaks new ground; it never makes discoveries which cast its previous positions in a different light, or challenges its own hidden contradictions in order to advance dialectically. Creationism has all the 'evidence' it will

ever require, in perpetuity, derived *via* tortuous reasoning appropriated from 1st century CE mystics, and 19th century natural theologians. Creationism relies on faux-scientific bafflegab mixed with spurious scriptural hermeneutics, and caps itself off with the opaque assertion of the Lord's ultimately inscrutable Will. This dissimulating *mauvaise foi* is *prima facie* not science; creationism bares no resemblance to the scientific method which emerged in the last four centuries of the Common Era.

Provisionally, a 'good' science's state of constant becoming in self-unfoldment is how actual fields of scientific inquiry keep themselves aloft. If a science does not make relevant advances on its subject matter by repeatable confirmation of testable hypothesis, it shrivels into dust. In other words, science needs to constantly validate its theories with auxiliary observations, instantiation of probable background theories with explanatory power, and repeated demonstrations of *unexpected phenomena*. Science is not in the game of formulating *likely* explanations of readily observable phenomena, but actually predicating the *unlikely*. For instance the highly unlikely, yet observationally confirmed 'tree of life' hypothesis (Freeman, 2003). The 'tree of life' is the complementary theory of evolution by natural selection that separates Darwinian evolution from its historical scientific competitors (i.e. Lamarckian evolution), which stipulates that all organic life descended from a single biological entity (Freeman, 2003). "The cell theory and theory of evolution predict that all organisms are part of a genealogy of species, and that all species trace their ancestry back to a *single common ancestor*." [Italics added] (Freeman, 2003) Biologists have illustrated the concept of a universal phylogeny by uncovering "the sequence of ribonucleotides in a molecule called SSU RNA that is found in *all cells*." [Italics added] (Freeman, 2003) If scientific inquiry is unable to generate these types of positive research results from unlikely predictions, then they succumb to the quietus of phrenology and other failed (or pseudo) sciences, and no one seriously takes them back up again (Sober, 2000). The theory of Intelligent Design is ultimately a spread of formal logical fallacies; Intelligent Design is a false dichotomy which compares the wrong objects and an inductive argument from analogy where the objects are not sufficiently analogous. Sober demonstrates the logical rigor of evolution by natural selection not by ruthlessly questioning the veracity of the historicity of the Bible, or by ridiculing creationism's absurd contemporary mouthpieces, or by taking on creation myths (in these works he never mentions the book of Genesis). Sober principally demonstrates this by deconstructing the faulty logic of 19th century creationist thinker William Paley.

Paley contrasts Intelligent Design not against the theory of evolution by natural selection (which Darwin wrote about 30 years after Paley wrote his *Natural Theology*), but against pure, roiling, random chance. Paley has the same philosophical enemy that St. Paul does; the ancient metaphysical system of Epicurus (Sober, 2008). St. Paul thought of the hated Epicureans as positing the emergence of our infinitely variegated natural world out of the pure vicissitudes of chance physical assemblage of insignificant atoms (Wentworth DeWitt, 1954). St. Paul referred to 'atoms' in this pejorative sense in his *Epistle to the Galatians* as "weak and beggarly elements." (Wentworth DeWitt, 1954) Atomism was for Epicurus a thesis against the existence of Platonic ideal forms, the theological determinism of his day, and the Aristotelian unmoved mover (O'Keefe, 2005). Without ever explicitly invoking his name, St. Paul vigorously denounces Epicurean philosophy, alleging that Epicurus' system was skeptical (in the jaded contemporary sense) and rooted in hedonistic nihilism, without recourse to the indifferent (possibly nonexistent) gods (Wentworth DeWitt, 1954). This was St. Paul's reactionary reading of sayings of Epicurus such as "If the gods listened to the prayers of men, all humankind would quickly perish since they constantly pray for many evils to befall one another." (Connor, 1993) It is within the philosophical context of St. Paul's straw-man of Epicurus that Paley famously compares biological entities with a pocket watch found on a lonely heath. (Sober, 2008) Paley postulates from their seemingly analogous 'irreducible complexity' that they both (the biological organism and the watch) must have been similarly designed by a benevolent creator's ingenious architectonics, and not the corollary of blind forces of

Epicurean chance. Paley's 'watchmaker argument' has become a perennial trope in the minds of contemporary apologists of creationism, who think of evolution by natural selection as nothing other then St. Paul's reactionary account of Epicureanism.

Unfortunately for Paley, the theistic argument from design was thoroughly logically razed before he even had the chance to write his formulation down. Notorious atheist, British Empiricist, and *rascal*, David Hume (in his *Dialogues Concerning Natural Religion*), set out the initial logical defeat of the analogical argument for God's existence from design. Historically, Christian thinkers investigated questions concerning biology through the idea of 'theological naturalism', which is the notion that God is an unfathomably wise engineer, whose transcendent fingerprints mysteriously cover the divine order of nature (Sober, 2008). Natural theologians held that through the intense naturalistic scrutiny of the world you would simultaneously uncover the 'Book of God's Works', providing proof of God's indubitable existence (Sober, 2008). Hume thought of the design argument for God's existence by naturalistic theology as a pitifully weak inductive argument from analogy. In his *Enquiry Concerning Human Understanding,* Hume thought (along with ancient *Pyrrhonist* skeptical thinkers and some moderns) inductive inference was decisively problematic to begin with; inductive logic is not deductive logic, so induction cannot guarantee the truth of its conclusions. Philosopher of science Karl Popper says of this problem "I hold with Hume that there simply is no such logical entity as an inductive inference; or, that all so-called inductive inferences are logically invalid and even inductively invalid." (Popper, 1953) Not only do these philosophers think of induction as inherently illogical (despite its prevalence in scientific and everyday thinking), but that inductive inference was altogether *illusory*.

The logical standard for soundness in deductive sentential logic is that the truth of the premises guarantees the truth of the conclusion, or a "valid inference from necessary premises" (Mautner, 1996). Hume, no doubt wracked by his comprehensive and overwhelming skepticism, insisted induction should be held to the same standard of logical verification deductive logic is. Hume thought the truth of inductive inferences must entail the truth of their conclusions as well, and that the conclusions must be truth preserving, as opposed to merely 'probable'. Hume believed that because you found probable results from induction, that you couldn't also be sure that some aspect of being wouldn't oscillate overnight; your conclusions couldn't definitively be shown to be absolutely correct, following from necessary premises. Granting it is at least intuitively the case that because you've seen nothing but black crows, the natural inductive inference that 'all crows are black' is fallacious, because there could be a day-glow pink crow somewhere just waiting to disrupt your chain of induction. Paley's 'watchmaker argument' has the identical deficits, the creationist affinity argument founders as an inductive argument, because it is simply too weak to hold true of its own accord. By definition, inductive arguments *cannot guarantee* the truth of their conclusions from their premises. Although Paley didn't expressly formulate his argument in these terms, Sober recasts Paley's 'watchmaker argument' into syllogism thusly;

Object A has property P.

Object A and object T are similar to degree N.

N==========

Object T has property P

Paley utilizes this logic to say the watch is analogous to the vertebrate eye, and can be thought of as an *a posteriori* teleological proof from Intelligent Design; blind organization by complete *Fortuna* couldn't be responsible for something so intricately composed. The creationist argument's crux is this inductive analogy between biological entities and artifacts (Sober, 2000). However, the actual problem with this

inductive argument is not as Hume or Popper suggests (the deductively invalid construction); the problem is that (from empirical observation); watches and biological entities *couldn't be more antithetical* objects to one another. The watch excretes nothing, it requires no transformation of chemical energy, watches have never been observed breeding, watches do not regulate their core temperatures, and they cannot be self-reflective, and so on. This alleged analogy has no affinity between its referents, and thus the argument from affinity *fails*.

Does Paley fare any better when his argument from design is reformulated not as an argument from analogy, but on a probabilistic formulation? If one compares the theory of Intelligent Design with mindless random chaos, Intelligent Design is clearly the more likely solution; it will win out over pure randomness every time (in terms of sheer likelihood). The likelihood of arriving at the complex variegated natural world by amaurotic forces purposelessly combining and recombining in the void with a dearth of possible teleology isn't zero, it is just vanishingly remote. Paley's design argument is reformulated by Sober as a likelihood construction thusly;

O: the watch has features G1 ... Gn.

W1: the watch was created by an Intelligent Designer

W2: the watch was produced by a mindless chance process

Pr (O/W1)>>Pr (O/W2)

This reformulation clearly presents the false dichotomy. Paley's argument fails on the probabilistic reframing because it will always be more likely than chance, but the real comparison is not between Intelligent Design and the straw-man of Epicurean metaphysics, but between different theories, one which makes novel predictions advancing research programs with unlikely outcomes, and one which makes no testable claims *whatsoever*. Creationism in comparison to the theory of evolution by natural selection is the real comparison, not creationism to St. Paul's polemical caricature of Epicurean chance.

Evolution by natural selection categorically does not operate randomly; natural selection is a thoroughly 'nonrandom' process, while genetic drift and mutation are indeed 'unguided' (Sober, 2011). "Natural selection occurs when there is heritable variation in fitness." (Sober, 2000) Traits are passed on, which are 'naturally' selected based on the trait's fitness values for reproductive survival in previous human environments, which emerge from mutation, genetic drift, and gene flow(Sober, 2011). Natural selection is categorically not a random process at all, but one based on non-random selection pressures on the fittest traits for reproduction from amongst the set of randomly generated and significantly constrained variables (Sober, 2011). Pocket watches clearly have the mark of an intelligent designer behind them… a human being, who constructs them to be nearly perfectly suited to function as mechanical chronometers. Biological entities, however, have no such perfection; they are often ill adapted, making due with the available material, not being endowed with 'the best of all possible' adaptations, but just the *possible* adaptations (Sober, 2008). This slightly counter-intuitive, non-perfecting, non-teleological feature of evolution by natural selection makes it even more likely to be the case, as a benevolent engineer intelligently designing the beings under his watchful care would have made them to be perfectly adapted to their environments (or else one cannot maintain His Omni-benevolence). The notion of beings being created to suit their environments is clearly at odds with the imperfect inheritance and temporal progression actually observed in the natural world (Sober, 2008). Imperfect adaptations of biological organisms raise the 'no-designer-worth-his-salt' objection to Intelligent Design (Sober, 2008).

If there were an intelligent, good, all-powerful being somehow guiding natural selection, ordering the appearance of mutation, or simply designing the beings of earth itself in their entirety from the ground up, would it really give such an inefficient system of digestion to rabbits? Surely it is a terrible design oversight from an engineering point of view that the rabbit must continuously eat partially digested feces in order to extract the maximum nutritional content from its food. Biologist Richard Dawkins, in *The Blind Watchmaker* describes the exterior mammalian male uro-genital system as an *imperfect* adaptation, and that its externalization over time was clearly progressive (Dawkins, 1986). There is also the example which so distressed Darwin himself; the horror of the wasp who lays its eggs inside a living caterpillar, which is deliberately paralyzed in the process, so the wasp larvae can consume the animal from the inside out, at their leisure (Sober, 2008). Examining these aspects of nature, one is likely to picture the creator God as a maleficent, ironic, or careless engineer, where wallowing ruthlessly in gore is the way life is intended to persist. Observation of the brutality of nature is surely a challenge to the idea of a caring creator's invisible guiding hand. One would think in order to preserve a holy God; one's theology would allow evolution by natural selection to do the unbelievably grizzly and bizarre work of propagation and alteration, so God will stay a spiritual entity worthy of veneration. Theology should be concerned with unpacking the divine unity of the mystical godhead represented in the figure of Christ (for instance), and not scientific epistemology, or how to make God the malicious shift-supervisor over this murderous world of bloody tooth and claw. In-the-last-instance, if the God of the Bible has some sort of ontological priority, then those who follow the Lord know that His ways are purposefully opaque! A mysterious and poetic *Deus Absconditus* is obviously not compatible with the data driven apparatus of scientific evidence.

Results like these firmly establish 'methodological naturalism' as the foundational ontology of biology, as instantiated and advanced by the theory of evolution by natural selection. However, does this epistemic soundness and ontological ground entail that 'materialism' is the ultimate metaphysical system as well? Does evolution's success over its naturalistic theological competitors show conclusively that it is impossible for there to be the ineffable, gods and goddesses, the infinite, or the mystery of being? As a result of there being no credible scientific evidence that evolution by natural selection is preserved by a teleological hand guiding mutation, and so on… does this mean that all beings as they exist, exist exclusively as motion and matter within a positively charged void, as such? In other words; does the sound scientific evidence for the methodological naturalism undergirding evolution flow across entailment into ontological materialism? Does naturalism in biology actually entail atheistic scientism metaphysically? Are there no entities which exist such that their existence in-themselves entails that physicalism and naturalism are indeed false? (Sober, 2011) Unfortunately for the pious acolytes of the nihilistic world-picture of scientism (which is the grandiose metaphysical claim that ultimate reality is empirical in nature and therefore ontologically physicalistic) there is at least one demonstrable counterexample which transcends space-time, is mind independent, and that material science finds utterly indispensable (Sober, 2011; Quine, 1960). As Pythagoras of Samos (one of the first philosophers of the West) might have said; *numbers* are indeed such mind-independent, abstract ontological entities, which transcend space-time.

In a preserved fragment, Philolaus the Pythagorean said "number is the sovereign and autogenic force which maintains the eternal permanence of cosmic things." (Philolaus, 1987) Human beings discover the elements of mathematics as opposed to invent them; the Pythagorean Theorem is true regardless of the existence of matter, it is similarly true regardless of the existence of minds to discover it, if we all die, the Pythagorean Theorem is still 'true'. These mathemes are invariant entities with-in becoming, characterized by both possible and actual being, which emerge as common property of mind after their initial discovery. In-the-last-instance it is correct to assert numbers do not 'exist' as we generally inclined to think of an object with 'existence'. Numbers indeed lack existence in the way we think of mind-

dependent ontic *concreta* (taking up space, having temporal duration, persisting until physical disintegration, recombination, and so on). However, the elements of mathematics 'exist' in a seemingly quasi-platonic, infinitely invariant, and abstract manner. There is probably no pure Platonic zone of self-existent, perfect forms of numbers; numbers are platonic in a weaker sense, as abstract ontological invariants which persist throughout time. Numbers are not merely the expedient creations of human intellect for their utility, but real *abstracta*. Numbers are not ontic beings, and yet, they have a categorically non-trivial and intrinsic relation to the scientific study of the universe, one which transcends the arbitrary symbols we affix to them. Philosopher of science, and psychologist Willard van Orman Quine (repudiating his former view) found abstract objects are not as easily dispatched with as he would have wished (Quine, 1960). Unfortunately, it is impossible to simply dispense with abstract objects with a wave of the hand, and still have constant, indispensible recourse to mathemes (in the form of numbers, sets, classes, and so on) for the instantiation of our physical sciences (Quine, 1960). If physics itself has recourse to an indispensible set of abstract ontological entities, then clearly not every entity within being is a reducible 'special case' of physics. The physical sciences are instantiated in part by quasi-platonic abstract entities, which are independent of humanity's brief inquiry into the infinitely expanding logarithmic mysteries of the *κόσμος*.

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