

Reflections on Dealing with Epistemically Vicious Students

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ABSTRACT

As a philosophy instructor, I strive to get my students to think critically about the subject matter. However, over the years I have encountered many students who seem to deliberately want to avoid thinking critically. I am talking particularly about some students in my “Science and Religion” course, who subscribe to scientific creationism and endorse anti-scientific beliefs which seem to be irrational. In this essay, I will offer reflections of my experiences from these classes, and argue that individuals who subscribe to creationism exhibit a combination of epistemic vices that makes them prone to holding incorrect views. Employing Quassim Cassam’s framework on the epistemic vices of conspiracy theorists in his “Vice Epistemology”, I argue that the creationists’ beliefs can best be understood as resulting from similar vices. Subsequently, I move to consider the reasons why these students subscribe to creationism, using Katherine Dormandy’s analysis in her “Does Epistemic Humility Threaten Religious Beliefs?” as a springboard. Following Dormandy, I explore how epistemic vices (in particular the lack of epistemic humility) lead to someone holding false—even irrational—beliefs. Finally, I will consider strategies in dealing with vice-charging the epistemically vicious students in a way that avoids the practical difficulties noted by Ian James Kidd in his “Charging Others with Epistemic Vice”.

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§1. Introduction

IN “VICE EPISTEMOLOGY”, Quassim Cassam (2016) argues that certain intellectual character traits should be understood as intellectual vices. Using the example of a 9/11 conspiracy theorist for illustration, Cassam submits that traits such as closed-mindedness, rigidity, and lack of thoroughness are part of the conspiracy theorist’s character, and it is these that impede their being an effective and responsible inquirer (2016, pp. 164–166). But conspiracy theorists are not the only inquirers who exhibit such character traits—or epistemic vices. As an instructor for a course “Science and Religion”, I have had a number of encounters with students whose disposition likewise shows epistemic vices, in particular when it comes to discussions about human origins. More specifically, these students subscribe to scientific creationism as their preferred viewpoint, and typically such a commitment belies being an effective and responsible inquirer.

Although accepting that God created the Universe is a central tenet of Christianity, my use of the term “creationism” is intended more narrowly than this. I use “creationism” to denote the set of beliefs associated either with Young-Earth creationism or Intelligent Design creationism. These include the belief in the sudden origin of the universe, the belief that mutations and natural selection are an inadequate explanation for the development of the current biodiversity, the belief that changes occur only within originally created kinds, the belief that humans do not share a common ancestor with other species, the belief that the Earth’s geology is best explained by catastrophism which includes a worldwide flood, and the belief that the Earth is of relatively recent origin (ca. 10,000 years). In short, by “creationist” I mean someone who

rejects the scientific consensus on naturalistic explanations of the known Universe, and prefers a view that emphasizes special creation instead.¹

Young–Earth creationism accepts a literal interpretation of the book of Genesis, and holds the aforementioned beliefs even in the face of overwhelming evidence to the contrary. In contrast, Intelligent Design (hereafter ID) creationism is not as strongly committed to a literal interpretation of the Bible, and ID proponents only subscribe to a subset of the creationist beliefs. Many ID proponents accept the theory of evolution, but what they contest is the notion that it is an exhaustive explanation, and they posit instances where a Designer intervened in the evolutionary history. Curiously enough, many individuals who are young–Earth creationists view ID creationism favorably. For the remainder of the essay, I will employ “creationism” as a shorthand reference to anyone who subscribes to the above beliefs in their entirety, or just to a subset of them.

§2. Epistemic vices

The topic I am exploring—that creationist beliefs are irrational, especially in light of available scientific evidence—is hardly a novel one.² Other authors who have explored the epistemic status of creationist beliefs have argued that creationists believe in outright absurdities because they find such beliefs comforting (Shermer 1997), or that they display anti–scientific irrationality, in

¹ These beliefs are further explicated, e.g., in Peters & Hewlett (2003, 79–85), as well as in Scott (2004, pp. 60–64).

² An anonymous referee raised the point that while the creationists’ beliefs appear irrational when judged against the background of current scientific consensus, maybe the rationality of those beliefs should be assessed against the background of creationists’ own beliefs. A similar point is raised by Michael Baurmann (2007), who argues that “under certain conditions, people can adopt a corpus of beliefs which may seem absurd from an external point of view—but under which individuals who believe in ‘fundamental truths’ do not behave more irrationally than individuals in our society who believe in the truth of science or the value of democracy” (2017, 151). Applying Baurmann’s point to the creationist beliefs, these beliefs are irrational against external standards, but they may still be rational against the standards internal to the creationist belief system. But this does not fully apply in the present case, for as soon as the creationists break out of their epistemic isolation, and enter into the wider community, their beliefs are subject to scrutiny using the standards of that wider community. Moreover, even if the creationist remains in their isolated society, they cannot escape the charge of lacking epistemic courage: as long as they uncritically accept their society’s beliefs, they are not searching for alternative explanations; I further discuss epistemic courage below, in section 3. Overall, to insist that the rationality of the creationist beliefs be measured by their own standards alone creates a situation where the rationality of beliefs is completely relativized. To paraphrase a point made by the former U.S. Senator Daniel Moynihan, creationists are entitled to their own opinions, but not to their own facts.

the traditional sense of “rationality” (Wilkins 2011). Alternatively, creationists’ reasoning has been viewed as suffering from rational pathologies; these are “situations where their reasoning deviates from the ideal in interesting ways” (Smith 2011, p. 219). Yet other authors have analyzed creationism in terms of cognitive dissonance (Plavcan 2007). However, each of these models have their deficiencies, which will be discussed below, in Section 7. The thesis I am defending in this essay is that that creationism is best understood as an exemplification of epistemic vice(s); this line of exploration is different from the above articulations, and one that can overcome their deficiencies.

In my essay, I will argue that we can do better by treating creationists as epistemically vicious³; such an analysis will show not just that creationists hold irrational anti-scientific beliefs, but it will explicate both how and why they do so. The full answer will invoke Cassam’s defense of vice epistemology, alongside Katherine Dormandy’s exploration of epistemic humility and its bearing on religious beliefs (2018). For this essay, I adopt Cassam’s view of inquiry epistemology, which has human inquiry as its chief focus:

There are also characteristic ways in which we do well as inquirers and characteristic ways in which we do badly. No doubt there are lots of reasons for that, but one key fact is the extent to which human inquirers are intellectually vicious. Since it is not uncommon for our inquires to be flawed because of our closed-mindedness, gullibility, wishful thinking, rigidity, and so on, any serious attempt to understand human inquiry should include the serious study of the prevalence and influence of such intellectual vices (Cassam 2016, p. 174).

In what follows, I will offer considerations to show how creationism as an inquiry into human origins can be best understood in terms of epistemic vices. After discussing some case studies based on my own encounters with creationist students, I will move to offer a defense of this approach.

³ Granted, I am basing this claim on a limited set of cases, and it may seem like a hasty generalization. Still, I am inclined to take the three creationists discussed below – A, D, and T – as typical representatives of creationism as a whole; this has been my own experience when it comes to encountering creationists, both in person and in print. Admittedly, there may be some creationists (like those discussed in Baurmann 2007) who are not vicious in the sense that they don’t lack epistemic humility. Still, I am hesitant to say that they exemplify the virtues of epistemic impartiality or epistemic courage.

§3. Classroom encounters

I have not conducted any formal interviews with my creationist students, so the following examples are based on personal encounters in the classroom setting in my “Science and Religion” course over the past decade. In order to protect the privacy of the students in question, I have changed their names and paraphrased any direct statements by them. I will discuss three creationist students, whom I will call A, D, and T, and show how each of them have exemplified characteristics that can be considered epistemic vices.

§3.1. Case of A

A was one of the more vocal creationists I have encountered over the years, and one of her objections to the theory of evolution was a stock creationist argument: evolution has not been directly observed, so it remains just another assumption. A’s objection was prompted by a class discussion of actual examples of evolution. One example of directly observed evolution is the evolution of the enzyme called nylonase, which allows bacteria to digest synthetic materials:

A group of researchers at Osaka University decided to see if this remarkable process could be reproduced in the lab. They took a culture of *Pseudomonas* bacteria that had no ability at all to metabolize nylon compounds and grew it on a medium containing small fragments of the nylon molecules as the sole source of food. After just nine days they found colonies of “hypergrowing” bacteria that had begun to master the trick of using nylon fragments as food. They then transferred these bacteria to a medium containing another nylon compound, and within three months they found that some of the bacteria had evolved the ability to grow on this compound as well (Miller 2008, p. 83).

This example was intended to illustrate that new information (in this case, the new enzyme) had “evolved naturally by means of gene duplication and mutation” (Miller 2008, p. 82). This contradicts the common creationist claim that mutations do not add new information (Isaak 2007, pp. 54–55).

In response, A argued that the bacteria’s ability to consume nylon–byproducts is a trait that some bacteria had all along, and when other bacteria died out, these bacteria thrived and were able to reproduce. A’s claim repeated a common creationist dogma, and she appeared utterly unwilling to even entertain the possibility of claims to the contrary. As an inquirer, A was remarkably closed–minded: given the information available to her, some of which amounted to counter–evidence to her beliefs, she remained unwilling to budge. Instead of even considering the scientific consensus on this matter, A

relied on niche publications that supported her world view (e.g., Batten 2003). As Cassam puts it, A “combines high level of trust for these dubious sources with high level of mistrust for the debunking efforts of genuine experts” (2016, p. 163). Much like Cassam’s Oliver the 9/11 conspiracy theorist, A “gives epistemic credit where it isn’t due and fails to give it where it is due” (2016, p. 163). Thus, if “cynicism and gullibility are opposite intellectual vices, discernment is the virtuous mean between them, and something which Oliver [and A] clearly lack” (2016, p. 163).

§3.2. Case of D

My encounter with D contained many of the same elements as did my encounters with A. What stood out the most is how D objected to the class discussion where Intelligent Design creationism was addressed. The readings for the particular lesson consisted of Jonathan Wells’s article “Survival of the Fakest” on how contemporary biology education is misleading (2000a); the article was based on his book *Icons of Evolution* (2000b). Wells’s article was paired with Alan Gishlick’s sustained rebuttal of Wells’s claims (2003). D found this juxtaposition perturbing because—in her words—there was no fair defense of Wells’s position in particular, or of Intelligent Design in general, even though the students were given access to writings by both authors. Even after seeing that Wells’s claims regarding Darwin’s finches, or the peppered moths, or any of the other of his so-called icons of evolution did not stand up to scrutiny, D felt that further defense should have been provided for the sake of fairness; she was not content that her side of the argument was subjected to a rebuttal. Put otherwise, she was disposed to defy the counterevidence that was presented to her beliefs (Dormandy 2018, p. 295).

§3.3. Case of T

As before, my discussions with T were reminiscent of my encounters with both A and D. T was in favor of creation science, but in my exchanges with him, I came to notice how T’s approach to science was modeled after his approach to the Bible. J. Michal Plavcan has usefully characterized this as follows:

The approach to science espoused by creation scientists appears derived from their absolutist approach to the Bible. Perusal of creation–scientists literature quickly reveals the common argument that the Bible encapsulates moral authority, that it is the literal Word of God, and, most important, that faith in redemption through Jesus is contingent on the literal truth of the biblical account. If the authority of the Bible were not absolute,

biblical text would be open to interpretation, and the absolute authority of the Bible would be in danger. Once this happens, then people can begin to pick and choose which biblical accounts they believe are literal truth and which are not. In other words, once one accepts a single contradiction in the Bible, the authority of the entire document is undermined, and faith itself is destroyed (Plavcan 2007, p. 376).

Moreover, Plavcan continues, creationists take this approach towards science as well:

The creation scientists apply the same logic to the natural sciences. They first set up a fundamental tenet —the earth was created exactly following the account in Genesis. All evidence from the natural world is then interpreted in a way that supports this tenet, regardless of how bizarre the explanation is. But the logic extends further. If a single textual contradiction can undermine the authority of the entire Bible, and faith in God and Jesus, then *a single contradiction in evolutionary models undermines the whole theory itself*. To creation scientists, evolutionary theory is disproved by almost any apparently contradictory evidence. For example, if a research produces an erroneous radiocarbon date, then radiocarbon dating is wrong. If radiocarbon dating is wrong, then all dating methods are wrong (Plavcan 2007, p. 377; my emphasis).

This is the kind of approach that I witnessed in my exchanges with T: on several instances, he brought up news items showing that new discoveries had caused scientists to revisit and revise some of their earlier claims. For T, this meant that the scientific enterprise was compromised to its core, as it could not deliver results that remained constant over time. But from an objective standpoint, T’s understanding of the nature of science is very idiosyncratic. Even a cursory review of the history of science shows how commonplace revisions are.

T’s particular approach to scientific inquiry fails to meet multiple epistemic virtues. It is not impartial (understood as “the willingness to exchange ideas and learn from them”), and neither is it courageous (understood as “the willingness to conceive and examine alternatives to popularly held beliefs, perseverance in the face of opposition from others (until one is convinced that one is mistaken), and the [...] willingness to examine, and even actively seek out, evidence that would refute one’s own hypotheses” (Montmarquet 1987, p. 484)). T was not impartial, because he was suspicious of the scientific consensus; for him, any scientific claim that did not fit into his beliefs was rejected out of hand. To the list of epistemic virtues that T does not possess, I am inclined to add humility, understood in the limitation–owning sense, as a “stance towards [one’s] cognitive limitations” (Dormandy 2018, p. 298). According to the limitation–owning view of humility,

A necessary condition for epistemic humility is having a certain stance toward your cognitive limitations. [...] Owing your limitations involves certain dispositions, such as the disposition to feel dismay about them and to try counteract them. It also requires a measure of awareness of them: you must have some knowledge of what they are and when they tend to arise, and you must be disposed to notice them when they do arise (Dormandy 2018, p. 298).

Dormandy argues that a “dogmatic–but–true believer... has cognitive limitations that he doesn’t own” (ibid.). For such a believer, their dogmatism results in cognitive limitations, which in turn impede their inquiries.

§4. Analyzing the epistemic vices

Following Dormandy’s example, I will assume for the sake of the argument that my creationist students —A, D, and T— have dogmatic–but–true beliefs. This means that “a certain core contingent of [their] religious beliefs is true, namely those which are definitive of [their] religious belief system” (ibid., p. 294). As my students have been Christians of various denominations, I am assuming (again, *arguendo*) that their core comprises of (or, contains) the belief that faith in Jesus saves (ibid.). In addition to this core religious belief, my students also have auxiliary or peripheral religious beliefs, e.g., “whether one’s core beliefs are compatible with some scientific theory” (ibid.); these beliefs may or may not be false.

As for their beliefs being dogmatic, this entails that they are unwavering in their beliefs: they are “disposed to retain it [the core belief] even in unfavorable epistemic circumstances, including situations in which [they] have significant evidence against it” (ibid.). According to Dormandy, dogmatic–but–true believers are disposed to defy counterevidence (understood as undefeated epistemic reasons that point to the falsehood of their beliefs) and to explain it away. Moreover, such believers are disposed “to perceive things that would yield evidence favoring her beliefs” (ibid., p. 295). These dispositions, Dormandy claims, are epistemically problematic:

One–sided evidence, including false–positive beliefs, confirms his confidence and gives him a weightier body of background beliefs in light of which he can more easily dismiss what counterevidence may slip through. Simplistic categories foster the simplistic perception that contributes to his receiving mainly one–sided evidence. Limitations in his ability to epistemically self–criticize ensure that little will obstruct a belief–forming process that solidifies his already existing beliefs —and they will hamper any attempts to improve matters (Dormandy 2018, pp. 299–300).

On this view, the dogmatic–but–true believer is likely to resist being labeled epistemically vicious; my experiences with the creationist students —A, D, T, as well as many others— corroborate this. In particular, A expressed vehement dismay over the course content: A claimed that she was sickened from hearing objections to creationism, as she took these objections amount to nothing but *ad hominem*s. Moreover, such a vice–charge is likely to be ineffective; “after all, she may say, God guides her cognition” (ibid., p. 300). But even if we grant —as Dormandy does— that the believer’s “core contingent of her religious beliefs is true, namely those which are definitive of her religious belief system”, it does not follow that we need to grant that all peripheral religious beliefs are true (ibid., p. 294). Among the latter, Dormandy counts the belief that the core contingent is incompatible with scientific consensus and scientific theories: “It is natural for religious believers to integrate their religious beliefs with what they think in other areas, such as natural science or politics. *Yet core religious beliefs do not imply anything about these areas on their own, but only in combination with auxiliary beliefs on peripheral and nonreligious matters*” (ibid., p. 302; my emphasis).

Following Dormandy’s analysis, it is the peripheral beliefs, rather than the core beliefs, that make creationism epistemically problematic:

Consider that it is natural for religious believers to integrate their religious beliefs with what they think in other areas, such as natural science or politics. Yet core religious beliefs do not imply anything about these areas on their own, but only in combination with auxiliary beliefs on peripheral and nonreligious matters. If these auxiliary beliefs are false, they may lead the believer to deduce further falsehoods. Look at the way in which Christian believers drew on peripheral religious beliefs about interpretations of Scripture, and nonreligious beliefs deriving from pseudo–anthropology, to align themselves with the apartheid regime in South Africa, with European fascist movements in the run–up to World War II, and with the pro–slave agenda in the antebellum United States. *Similar points may be made about some of the perennial conflicts over science and religion: false beliefs about the interpretation of certain biblical passages relating to astronomy led the church for centuries to hold that its core beliefs were incompatible with astronomical developments* (Dormandy 2018, p. 302; my emphasis).

To this list, we could add the auxiliary beliefs that resulted from thinking that the core beliefs entailed incompatibility with evolutionary biology. As detailed by Ronald Numbers (1993), the origins of present–day scientific creationism largely owe to the work of Henry Morris and John Whitcomb and their book *The Genesis Flood* in 1961. “The Genesis Flood ... opened with an affirmation on belief in ‘the verbal inerrancy of the Scripture’” (Numbers 1993, p. 200). This

presupposition came to characterize all the subsequent interpretations of the world:

Morris believed that God had revealed himself in two books, nature and the Bible, which could be studied independently, though with priority given to the Scriptures. Because God was the author of both works, Morris thought it inconceivable that God's Word would contradict his world. To a great extent, Whitcomb shared this conviction, but as a strong presuppositionalist, he rejected reason and experience as sufficient means of discovering theological truth. For him, the character and purposes of God could be found only through the Bible, the reliability of which he accepted on the basis of its own claims rather than on the basis of external evidences (Numbers 1993, p. 200).

The peripheral beliefs regarding the inerrancy of the Scriptures clearly color any subsequent interpretation of the world.

Put in more general terms, the dogmatic—but-true religious believer assumes that Darwinian discoveries (among others) constitute an epistemic challenge to her core beliefs. But this assumption is mistaken: what is challenged is not her core religious belief (which is assumed to be true, if only *arguendo*), but one (or more) of her peripheral beliefs (which are not guaranteed to be true). This situation is elaborated in the following passage by Ludwig Wittgenstein:

How does the philosophical problem about mental processes and states arise? —The first step is the one that altogether escapes notice. We talk of processes and states and leave their nature undecided. [...] But that is just what commits us to a particular way of looking at the matter. For we have a definite concept of what it means to learn to know a process better. (The decisive movement in the conjuring trick has been made, and it was the very one that we thought quite innocent) (Wittgenstein 1958, §308).

Although Wittgenstein talks about mental processes and mental states, the key idea can be applied to the case of the auxiliary/peripheral beliefs, *mutatis mutandis*. In brief, we witness the conjuring trick—a rabbit being pulled out of the hat, say—and we start to ponder how the rabbit could have been in the hat to begin with. And this is the capital mistake: we know that this is impossible, so it seems that we are mistaken in our beliefs, and we would have to reject them in order to accept the situation. But this is what we are unwilling to do, and we vehemently oppose what we just witnessed. The point is that we are mistaken until we realize that we're asking the wrong question; we only assumed that the rabbit was in the hat. For the present purposes, we similarly go astray in a wild

goose chase if we focus on how to respond to the new scientific discoveries that seemingly challenge our core beliefs. The challenge is to the auxiliary beliefs instead, and one should focus on why we had accepted those beliefs to begin with.

It appears that the auxiliary belief that the Bible is to be interpreted literally was challenged—and rejected—already by St. Augustine in the fifth century. In his book *The Literal Meaning of Genesis*, St. Augustine states the following:

Let us suppose that in explaining the words, *And God said, "Let there be light," and light was made*, one man thinks that it was material light that was made, and another that it was spiritual. As to the actual existence of spiritual light in a spiritual creature, our faith leaves no doubt; as to the existence of material light, celestial or supercelestial, even existing before the heavens, a light which could have been followed by night, there will be nothing in such a supposition contrary to faith until unerring truth gives lie to it. *And if that should happen, this teaching was never in the Holy Scripture but was an opinion proposed by man in his ignorance* (St. Augustine 1982, p. 42; my emphasis).

In this passage, St. Augustine acknowledges that the teachings of the Scripture regarding “material light” can stand up to the point when “unerring truth” shows them false. Although Augustine lacked the scientific knowledge provided by Copernicus and Darwin, the general tenor of his writing suggests less-than-a-literal interpretation, when it comes to what the Scripture says about the material light. He continues:

Usually, even a non-Christian knows something about the earth, the heavens, and the other elements of this world, about the motion and orbit of the stars and even their size and relative positions, about the predictable eclipses of the sun and moon, [...] and so forth, and this knowledge he holds to as being certain from reason and experience. Now, it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on these topics (St. Augustine 1982, pp. 42–43).

Put succinctly, St. Augustine admonishes those who hold on to a literal interpretation of “material light” mentioned in *Genesis 1* when the scientific understanding shows that this is not how light behaves. There seems to be no reason not to generalize St. Augustine’s point to matters beyond his immediate purview, and to apply this to the cases of religious beliefs proffered in opposition of the scientific consensus. More pointedly: if the scientific discoveries show certain interpretations of the Scripture to be mistaken, and if

these do not pertain to the spiritual matters —core beliefs— then it would be a fool’s errand to fight against the discoveries.

§5. Dealing with the encounters

At this juncture, I would like to shift the focus from the individual students to the classroom. Like many other instructors, I have experienced a certain level of frustration in dealing with creationist students in class. To illustrate how widespread this is, Kelly Smith invokes *Monty Python and the Holy Grail* and its famous dueling scene, where King Arthur fights an intransigent Black Knight, who refuses to admit defeat —even after the melee renders him a quadriplegic:

[C]olleagues who deal with creationists regularly tend to embrace this analogy with great enthusiasm. It perfectly captures the sense of disbelief we all have felt when dealing with an especially stubborn creationist. Part of the reason people laugh when they watch the movie is because they know the situation is so completely unrealistic. Yet those who have dealt with creationists want to make the point that there really are such people and it’s not so funny when you have to take them on. The analogy strikes us as so apt that, with a bit of encouragement, we can make all sorts of extended comparisons (Smith 2011, p. 221).

Although King Arthur triumphs against the Black Knight, just as scientists’ and philosophers’ arguments vanquish the creationist canards, this verdict is only reached by those who are trained in dueling —or, analogously, in assessing arguments. For the analogy to capture the public’s point of view, Smith submits it would have to be revised:

[W]e will have to allow the contest to be judged not by knights expert in real combat, but by the crowd watching the contest. Unfortunately, the crowd is not knowledgeable about combat —they have never even seen a real fight before and wouldn’t know a morning star from a halberd. Worse still, they are not objective. Imagine Arthur gazing out at the crowd waiting to judge the fight and seeing a sea of black flags, signs saying “Go Blackie”, vendors selling dolls of the king impaled on a black sword, etc. [...] *Now we have a proper analogy* (Smith, pp. 222–223; my emphasis).

According to Smith, if we make these revisions to our analogy, it becomes clear why philosophers have had very little impact in convincing the public —or students— that the controversy doesn’t really exist. If King Arthur were to persevere fighting the Black Knight according to the standard rules of engagement, it would be an exercise in futility. Analogously, if philosophers approach the public with the same style they use when addressing their

professional peers, we remain captivated by a bad idea. Ludwig Wittgenstein aptly characterizes the inherent difficulty that philosophers face in the following: “Teaching philosophy involves the same immense difficulty as instruction in geography would if a pupil brought with him a mass of false and far too simple //and falsely simplified// ideas about the course and connections of the routes of rivers //rivers// and mountain–chains //mountains//” (Wittgenstein 1933/1993, §90, 184).

To reiterate Smith’s point: Philosophers have the arguments to show that there is no large–scale conflict between scientific understanding of the world and personal religious convictions. But the problem is not in lacking such arguments; rather, it is in conveying this message to the audience.

It may sound like a fool’s errand to take on committed creationists head–on. However, a classroom situation is not quite as dire as Smith makes it sound. Typically, the background beliefs in a classroom are more diverse. Although I do not have evidence from all my classes over the years, the few times I have surveyed my class, I have come up with results similar to Gallup’s poll on origins and development of humans. Presented with a question about human origins, and the answer options “Humans developed with God guiding the process”, “Humans developed but God had no part in the process”, and “God created humans in present form”, each of the options is usually supported by one–third of the class (Swift 2017).

The classroom encounters with the creationist students, if gauged as a debate between the creationist ideas and the scientific consensus, are invariably a failure. In my experience, I have yet to change the mind of any creationist. In this sense, Festiger, Riecken, and Schachter were correct when they wrote “A man with a conviction is a hard man to change. Tell him you disagree and he turns away. Show him facts and figures and he questions your sources. Appeal to logic and he fails to see your point” (1956, p. 1). However, following the suggestion by Smith, it turns out that looking at the results of a direct confrontation is the wrong way to assess such encounters. Smith’s suggestion is to be mindful of the audience—all the students in the class, and not just the creationist one(s). Following Smith, I have found it to be more useful to turn encounters with creationists into open discussions. The class members as a whole are more receptive to scientific ideas, especially when those ideas are displayed out in the open and juxtaposed with the creationist claims.⁴

⁴ This is not to say that the rest of the students in the class are entirely vice–free, when it comes to the epistemic virtues. However, I am omitting this group from my analysis.

Suppose, for instance, that the creationist student persists on their claim that while microevolution (understood as mutations below the species level) is unproblematic, it is macroevolution (understood as mutations above the species level) that is deeply flawed. If the creationist student is allowed to commandeer the discussion and use their definition of macroevolution (according to which evolutionary changes occur in members of a species), the battle is lost.⁵ But it is a straightforward matter to demonstrate that there is only one kind of evolution, and the difference between microevolution and macroevolution has to do with the time scale; most students can be brought up on the basics of this in a span of few minutes. And once the students see that there is only one kind of evolution, they are more apt to side with the scientific consensus than to go with creationism.

§6. Perils of epistemic vice–charging

But let us not forget about the individual creationist students. How are we to approach them and their irrational anti–scientific beliefs in the classroom? We could charge them with epistemic vices (as I have done, even if not in those precise terms). But according to Ian James Kidd, charging others to be epistemically vicious is rife with obstacles. Epistemic vice–charging can be rhetorical or robust. The former “involves an agent expressing a negative attitude, opinion, or evaluation of some other agent, whether expression is oral, literary, or bodily—a curt tweet, audible groan, eye–rolling, and so on. But, crucially, that agent could not elaborate or “unpack” the charge if asked to, for instance by explaining the reasoning that supports the negative judgment” (Kidd 2016, p. 183). In contrast, the latter involves “primarily an active and intentional attempt to persuade others for the ultimately ameliorative reason of making things better”; only robust charges count as legitimate criticism (ibid., p. 184).

When it comes to making vice–charges, Kidd argues that there are three relata: the critic, the target, and the audience “all of whom could be the beneficiaries of a charge, even if only some are” (ibid.). As an instructor, I have only expressed the robust charges against A, D, and T, and in those instances, I specifically focused on what was being said rather than on who said it.

⁵ When it came to moderating these discussions, I did my best calling out the gross mistakes and inaccuracies on both sides. What’s more, my policy in teaching this course in particular is not to reveal my personal views during the semester. Although I may have come down more harshly on misrepresentations of science, I did my best in not allowing the religious students to feel that their viewpoints were not worthwhile.

Moreover, as indicated above, I eventually opted to leave the target out of my charge altogether, and focused on the audience. The reasoning behind this was simple: the targets tended to be epistemically vicious enough that my attempts to reach them to ameliorate their vice were for naught. As Wittgenstein aptly remarked,

The philosopher says ‘Look at things *like this!*’ —but first, that is not so say that people will look at things like this, second, he may be altogether too late with his admonition, & it is possible too that such an admonition can achieve absolutely nothing & that the impulse towards such a change in the way things are perceived must come from another direction (Wittgenstein 1994, pp. 70e–71e).

Even though I have been unable to reach to my creationist students, I feel that I have made progress when it comes to the larger audience in the classroom. The one-on-one exchanges have been witnessed by the rest of the class, who form their opinions on which arguments stand and which ones fall. This approach has the added advantage of avoiding the problem of consensus when it comes to vice-charges. According to Kidd, this problem arises from the fact that there is scarcely an agreement between the critic and the target, but for the vice-charge to be robust, there would have to be such an agreement (2018, p. 192).⁶ The target —the creationist student— would minimally have to accede that they were in the wrong. However, this is what they are unlikely to do. But by focusing on the audience rather than the target, the critic is able to steer the audience away from committing epistemic vices by building on the nascent consensus that exists.

When it comes to the creationist students themselves, it seems that their epistemic vices make them extremely recalcitrant to changing their views. Thus Dormandy:

Too many false auxiliary beliefs may threaten one’s true core beliefs themselves. If the believer somehow comes to feel the disconnect between her belief system and reality, she may blame her core beliefs alongside the false auxiliaries, and abandon the whole lot. This outcome is all the more probable given the tendency, cultivated by her dogmatism, to see

⁶ According to Kidd, the problem of consensus “begins with the point that efficacy of a vice charge is contingent on consensus between critic and target. There must be consensus, first, on the *definition* of the vice being invoked —dogmatism, say, or hubris— and, second, on whether the target does in fact *exemplify* that vice. One can imagine a situation where the critic and target both agree on what dogmatism is, but disagree about whether it is exemplified by the target —who, naturally, denies this” (Kidd 2018, 192).

the world black and white and to lack the skills of epistemic self-evaluation. Epistemic humility, among other things, promotes the kind of subtle and complex reasoning that can help a person see what her core beliefs really commit her to and what they do not (Dormandy 2018, p. 302).

But instead of abandoning their belief system, the creationists tend to double down and maintain them in face of all the counterevidence. Again, the lack of epistemic humility does not allow them to see that the auxiliary beliefs are not part of the core. Such a lack of discernment leads them to think that the literalist interpretation is part of the core, which must be maintained at all cost.

It may be difficult to discern whether a creationist's belief about modern science is a core belief or a peripheral one. The following point seems to illustrate the distinction:

As Christians, we can say we know. And so far as the Word of God is concerned, no, no one is ever going to convince me that the Word of God is not true.

We build models based upon the Bible, and those models are always subject to change. The fact of Noah's flood is not subject to change; the model of how the Flood occurred is subject to change, because we observe in the current world, and we're able to come up with maybe different ways this could have happened or that could have happened. And that's part of that scientific discovery" (Ham and Nye 2014, pp. 58–59).

In these comments, the creationist Ken Ham demonstrates that the belief in the veracity of the scripture is a core belief. However, he also leaves open the possibility that the models based on the events in the scripture are subject to change; this suggests that these are peripheral beliefs.⁷ Although Ham is a creationist in a rather extreme sense, we can use him for generalizing the point: the creationist belief that the Earth is less than 10,000 years old is a model based on an interpretation of the Scripture. As such, it is a peripheral belief, and not a core belief. Therefore, in dealing with creationists, we can acknowledge that they are committed believers who hold false peripheral beliefs dogmatically.

Dormandy identifies an epistemic predicament when it comes to dogmatic beliefs: "On the one hand, dogmatic belief is epistemically vicious, in particular epistemically un-humble, but on the other hand it seems an important tool for safeguarding important true beliefs in an epistemically hostile environment"

⁷ Here, I am not attempting to catalogue all the beliefs that creationists have and sort them into core beliefs and peripheral beliefs. For further discussion, see Thielen (2011) and McGrath (2007, pp. 129–133).

(*ibid.*, p. 296). Moreover, “When faced with the choice between epistemically vicious but true religious beliefs, on the one hand, and epistemically virtuous yet possibly false ones, she picks the truth” (*ibid.*). The committed believer may have true core beliefs, which she holds dogmatically. But in addition, she has false peripheral beliefs which, too, are held dogmatically. The conjunction between the true core belief and the false peripheral belief is close —maybe even too close, for although it is possible to discern the distinct elements, it is not clear that the believer has done so. Although there is daylight between the core belief and the peripheral belief, there is very little of it. As a result, it seems we would have to forgo our previous assumption that the believer’s core belief is true; by rules of logic, the false peripheral belief renders the entire conjunction false.

For the dogmatic believer, choosing dogmatism over humility is a survival strategy in an epistemically hostile environment; if the believer is a creationist student, a philosophy course may constitute just such an environment. Dormandy acknowledges that “eschewing humility helps preserve this unwavering confidence in her core beliefs, which are true —but the side effect is that she remains unwaveringly confident in her peripheral religious beliefs and her nonreligious beliefs, some of which are bound to be false” (*ibid.*, p. 301). This in turn has epistemically disastrous consequences: “If enough of the non-core beliefs —or if the wrong subset of them— are false, then her belief system as a whole, though right about core religious matters, may wind up erring significantly” (*ibid.*, pp. 301–302). And it is because of this that the believers —the creationist students, in this case— end up holding anti-scientific beliefs even in the face of overwhelming counterevidence.

§7. Why epistemic vices?

Although it may have sounded redundant to analyze creationism in terms of epistemic vices, especially given how there are a plethora of other analyses available, I submit that this analysis confers advantages that the others lack. It may appear tempting to classify creationists as irrational (Wilkins 2011) because they subscribe to anti-scientific beliefs —even in the face of overwhelming evidence for scientific consensus, or to think they suffer from rational pathologies (Smith 2011), or to think that creationist thinking is characterized by cognitive dissonance (Plavcan 2007). As useful as these analyses are, none of them fully account for why the creationists hold such beliefs.

Wilkins begins by exploring the notion of rationality, and argues that while charges of irrationality is commonplace, they rest on an idealized notion of

rationality. He introduces the notion of bounded rationality, wherein an individual's "rationality" is bound by resource limitations "of time, evidence, and cognitive limitations of memory and processing" (Wilkins 2011, p. 209). According to Wilkins, the apparent irrationality of creationism is "the developmental outcome of a series of 'fast and frugal' boundedly rational inferences rather than as a rejection of reason" (Wilkins 2011, p. 207). Wilkins subsequently moves to offer suggestions for effective science education that could counter some of the inferences made by creationists in their formative years. However, the focus of Wilkins's analysis—as well as that of his proposed remedies—lies chiefly on the environmental factors, leaving out the considerations about the individual.

As for Smith, he articulates some of the pathologies that creationists commonly hold (2011, pp. 231–233). Yet, this cataloguing does not address the origin of these pathological beliefs, such as the belief that one has to choose between religion and science (*ibid.*, p. 231). When it comes to explaining the creationist beliefs in terms of cognitive dissonance, Plavcan himself admits that "the cognitive–dissonance model is insufficient to explain completely the beliefs and behavior of creation scientists" (2007, p. 375). A creationist may suffer from cognitive dissonance when it comes to her religious beliefs and what she witnesses about the world, but this does not tell us why she holds the religious beliefs to begin with. Additionally, Plavcan notes, a creationist may be able to reconcile the dissonance and validate their beliefs, provided that they are able to make their argument plausible in light of their own belief system (*ibid.*, p. 374). In light of these shortcomings, I submit that the epistemic vice analysis offers further insights. Consider Cassam again:

Oliver's intellectual vices help explain his belief that P without being reasons, or his reasons, for believing that P. Rationalizing and character–based explanations work in different ways but are not unrelated: the reasons Oliver gives for believing that P only strike him *as* reasons because he is gullible, cynical, and prejudiced. [...] Oliver has been led astray by his intellectual character defects and it is by reference to these defects that we can start to make sense of his bizarre views (Cassam 2018, p. 163).

Mutatis mutandis for the creationists: due to lacking epistemic humility and not being epistemically courageous or impartial, the creationists commit themselves to holding beliefs that are not supported by reality, especially when it comes to inquiries and questions pertaining to evolutionary biology, or cosmology, or geology, or human origins. The creationists are interested in inquiring into these, but their epistemic vices prevent them from being effective inquirers.

“Because [they are] gullible, dogmatic, closed–minded, cynical, prejudiced, and so on, [they] ignore important evidence which bears on [their] questions, rely on unreliable sources, jump to conclusions and generally can’t see the wood for the trees” (Cassam 2018, p. 164). We can assume that as inquirers, the creationists are as interested in reaching truth as anyone else is; we could go as far as to assume that this is among their core beliefs. However, it is because of their (false) peripheral beliefs, they are led into a predicament of their own making: they reach for competing epistemic goods —religious truth and truth about the world— and their own false peripheral beliefs prevent them from advancing towards truth about the world.

Does this mean that the creationists are hopelessly vicious, when it comes to epistemological matters? I think not. After all, to use an analogy, epistemic vices are not necessarily akin to mortal sins; they are more like venial sins —effective only as long as one commits them. So, it is possible for a creationist to acquire epistemic virtues like humility which would allow them to revise their auxiliary beliefs and replace the false beliefs with true ones, all the while retaining their core belief. But then again, attempting to convert a creationist to non–anti–science beliefs may not be advisable. Rather, “[it] is much better to empower her to explore for herself how her core truths hold up in a world that can sometimes mislead, than to leave her at the mercy of that world. She will presumably pick up more non–core truths, and deeper understanding, along the way” (Dormandy 2018, p. 303). In my own experiences, I sincerely doubt I have succeeded in instilling these virtues to my students, at least when it comes to the cases of A, D, or T. But as Wittgenstein put it, “Quite different artillery is needed here from anything I am in a position to muster” (Wittgenstein 1994, p. 71e).

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