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Article

# Challenges and Opportunities in Teaching Interdisciplinary Courses on Islam and Evolution: A Theology-Centric Perspective

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**Abstract:** In the nascent discourse of Islam and science, the discussion of how to reconcile evolution with Islam is one of the most, if not the most, pressing concerns. This article reviews the various studies that have looked at the reception of evolution in multiple contexts to highlight the pedagogical challenges that materialise for Muslim students and teachers. It argues that, while recognising the obstacles and challenges mentioned in other studies, the crucial subject matter of Islamic theology (*‘aqīda*) is not fully appreciated in those analyses. How and why theology is a vital discussion matter is examined, along with the benefits that it can offer. These insights could provide fodder for teachers and students when discussing the thorny topic of Islam and evolution in classroom settings. This paper’s deliberations could also be of interest to researchers examining the pedagogy and reception of evolution in Muslim contexts.

**Keywords:** Islam; Muslim; theology; science; evolution; pedagogy; students; teachers



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## 1. Introduction

In 1859, Charles Darwin published *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, which created a lasting impact in biological sciences as well as religion (Himmelfarb 1996). He mirrored what Newton did in physics for biology (Hull 1973). That is, he established the blueprints of an explanatory framework through which all biological sciences could be connected and understood (Bowler 2009). In this vein, the late Theodosius Dobzhansky (1973, p. 125), one of the chief pioneers of evolutionary biology, said: “Nothing in biology makes sense except in the light of evolution”.

Evolution is the theory that all biological life is connected through a long historical process. It explains the origins of all the *species*<sup>1</sup> that once existed in history, as well as those that exist today. It claims that all species can be placed in the pattern of a tree, hence called the tree of life. Species go through periods of stasis and change, and eventually branch out into various evolutionary pathways. Later species, then, are descendants of earlier ones, with humankind being no exception. Pushed to its logical conclusions, humankind did not just ‘pop’ into existence, but is part and parcel of a bio-historical process, that is, evolution.

This runs against traditionally held Islamic beliefs, particularly the origins of humankind that are believed to have started with the miraculous creations of Adam and Eve. It is then no surprise to see that Muslims see this as an actual conflict or potentially conflicting narrative. Given this tension, how can Muslim instructors and students of science, as well as students of Islamic studies engaging with scientific theories like evolution, navigate this issue *pedagogically*? This article aims to address this question by providing a pedagogical template on Islam and evolution.

To this end, the science of evolution will be reviewed first to demarcate it from its colloquial and non-scientific connotations clearly. This will be followed by a critical review of the contentions or problems, which will be informed by two sources, that some might

have with the theory of evolution. First, there is the sociological literature on how Muslims have received evolution in various contextual spaces. The second is an autoethnographic account, which is informed by the author's:

- (1) Research and writing on the topic of Islam and evolution, as well as the broader subject of Islam and science. The author has written a theological monograph on evolution from the lens of the Sunnī school of Ash'arism (more on this later), arguing that evolution can be accepted provided that a few theological qualifications are maintained (Malik 2021).
- (2) Experience in developing and teaching courses as an interdisciplinary educator on Islam and evolution at various institutions, universities, and seminaries from various parts of the world.<sup>2</sup>
- (3) Non-pedagogical engagements with various communities within the Muslim populace in academic settings and public forums. These include the Muslim seminary community, the academic community, and the laity, all of whom have their respective concerns about Islam and evolution.
- (4) Observations of how well-known interlocutors are discussing evolution in cyberspace, particularly YouTube. As indicated by others, e.g., Moran (2020), there are influential speakers from various backgrounds that play important roles on YouTube for obtaining Islamic knowledge, with evolution being no exception. Given this, references to specific influential speakers who have clout in cyberspace will be made. This is important to acknowledge, as cyberspace influencers actually or potentially influence students' understanding and acceptance of evolution.

Finally, the author shall present his own pedagogical approach to Islam and evolution. It is argued that a theology-centric approach can assist in reducing the observable tensions, thus facilitating the education of Islam and evolution. Theology (*ʿaqīda*) represents a discipline and a body of religious commitments that Muslim believers hold, and these are held on to very dearly because of their eschatological value (more on this later). Identifying those theological commitments and juxtaposing them with the narrative of evolution may help understand the interface of Islam and evolution more clearly.

To be sure, the approach discussed here should not be taken as the only way of addressing the pedagogy of Islam and evolution, but it is one that pays considerable attention to the theological dimension. As observed in some of the extant literature (which will be discussed shortly), as well as the author's practice as an educator, this seems to be the main concern for a significant number of Muslim instructors and teachers.<sup>3</sup> This article, then, hopes to serve as a reference and a paradigmatic resource for instructors and students.

## 2. The Science of Evolution

The word 'evolution' carries a lot of colloquial connotations that do not accurately correlate to the scientific understanding and usage of the word (Malik 2021, p. 22). It, therefore, will help if we clarify what evolution means in its scientific context.

The theory of evolution, as understood today, has three core components. The first is *deep time*, the straightforward idea that our earth is significantly older than we thought. Historically, due to certain Biblical inferences, a 6–10,000-year-old interpretation of the earth's age gained a lot of currency, which set the initial context in the development of geology (Ginzberg 1984; Young and Stearley 2008). However, with the advancements of modern science, most notably the discovery of radioactivity, it is now known that the earth is 4.6 billion years old, several magnitudes older than the Biblically inspired estimates (Dalrymple 2004).

The second concept is known as *common ancestry*. Previously, it was held that God directly created every single species without any prior process. In other words, they were created instantaneously and miraculously, which is known as *creationism*.<sup>4</sup> Evolution challenges this idea. To make this clear, think of a family tree. We have parents, who in turn have parents, who in turn have their parents, and so on. We develop a family tree when we put all these people together chronologically with lineal lines that show the succession of one generation after another. Evolution takes this exact concept but extends it to entire species instead of individuals. So, cats, dogs, monkeys, humans, and all the species that exist now and those that we know existed before did not just ‘pop’ into existence. They are all linked together in a long, historical tree of life. This is a fundamentally different viewpoint compared to the prior worldviews (Futuyma and Kirkpatrick 2017, pp. 27–54, 399–544).

The third principle is the *causal mechanisms* of evolution. How does evolution work? The answer has two parts. When Darwin first proposed his ideas, he suggested the mechanism known as *natural selection*. Consider any environment, e.g., a desert, which should be taken as an analogue of a filter. Each environment has its unique ecosystem, with idiosyncratic food sources, predators, habitats, and physical conditions. Imagine placing one hundred different species in a new environment. To survive, they must acclimatise and adapt. Species that cannot do so will eventually die off and become extinct. By contrast, species that can and do will live on. This is known as *Darwinism* (Bowler 2009).

However, how species develop new traits was not clear to Darwin. This question was addressed posthumously once the field of genetics was introduced in the early part of the twentieth century and, thus, something that Darwin could not have had any knowledge of. Genetics has given us critical insights into our basic units of biology: genes and DNA. These biological blueprints govern (partly, if not completely) an individual’s physical appearance, dispositions, and traits. As an example, there is a genetic ‘code’ to determine hair colour. Genes are constantly mutating from one generation to another. This leads to differences between parents and their multiple offspring, each of which can vary in different ways, for instance. Mutations can be beneficial, harmful, or neutral, and they are caused by various factors. It is the open-ended nature of genetic mutations that makes them random. Once genetics was established as a discipline, it was coupled with natural selection, which provided a better account of evolution. This was achieved in the 1950s, and this amalgamation is known as *Modern Synthesis* or *Neo-Darwinism* (Ruse 1999).

In short, evolution is a *multi-propositional theory*. This is important to highlight because, as we shall see shortly, by treating evolution as one monolithic entity, some participants see the discussion as a false binary; either evolution is true and Islam is false, or Islam is true and evolution is false. Such simplistic framing of the landscape removes the several nuances that can be explored and developed therein.

For the rest of this article, the three aforementioned principles, summarised below, will be collectively referred to as evolution or Neo-Darwinism (Fowler and Kuebler 2007; van den Brink et al. 2017):

1. *Deep time*—the earth is 4.6 billion years old
2. *Common ancestry*—all biological life is interconnected through a long, historical lineage like a family tree
3. *Mechanisms*—there are two primary driving forces that cause evolution to occur:
  - a. *Random mutations*
  - b. *Natural selection*

### 3. A Critical Review of the Contentions with the Theory of Evolution

Most of the sociological research that looks at how Muslims understand and accept evolution is focused on Muslim-majority contexts, with a variety of quantitative and qualitative approaches and surveys, analysing the views of professionals, teachers, and students, as well as textbooks and the educational infrastructure. These include Tunisia (Aroua et al. 2009), Egypt (Mansour 2008a, 2008b, 2008c, 2010), Pakistan (Asghar 2013; Everhart and Hameed 2013), Lebanon (BouJaoude et al. 2011), Indonesia (Lay et al. 2018), Iran (Kazempour and Amirshokoohi 2018), Malaysia (Osman et al. 2018), and Turkey (Deniz et al. 2008, 2011; Muğaloğlu 2018; Peker et al. 2010). Detailed research on Muslims' perceptions of evolution in Muslim-minority contexts is slowly trickling out. Some of the available published studies are from Britain (Unsworth and Voas 2018; Betti et al. 2020), Canada (Asghar 2013), France (Clément 2015a, 2015b), South Africa (Stears et al. 2016), and the US (Barnes et al. 2021; Fouad 2018).

These studies suggest a variety of responses on how Muslims understand and accept the theory of evolution, with most suggesting a rejection (Hameed 2008). Some reject the entire theory altogether, while others only reject human evolution. Though not always the case, overall, Muslims tend to reject evolution more so than their counterparts from other religions (Barnes et al. 2021; Betti et al. 2020; Clément 2015a, 2015b; Carlisle et al. 2019, p. 157; Unsworth and Voas 2018). It will be instructive to survey some of the reasons for this.

#### 3.1. The Science of Evolution Can Be Misunderstood

A significant problem is the scientific education of evolution (Asghar et al. 2014). Even teachers sometimes misunderstand the theory, let alone students and laypeople (Rachmatullah et al. 2018). For instance, some think of evolution as sequential blocks and thus in linear terms; that is, they believe all species *completely* transform into new species. This misunderstanding comes from not realising the branching process that makes up the tree of life. In other words, not every *member* of a species needs to evolve for evolution to occur. A sub-community of a species can evolve without the entire species undergoing evolution, which is why *mother* and *daughter species* can co-exist at one point in time. In other words, the concept of branching is sometimes lost among teachers and students. This is linked to the famous misconception that humans come from monkeys or chimpanzees (Asghar 2013),<sup>5</sup> which is incorrect, as chimpanzees are humans' evolutionary cousins, not their progenitors. Put another way, humans and chimpanzees have a common ancestor (Gregory 2008).

Another critical issue that comes up in the discussion is how evolutionary biologists themselves disagree with each other on certain aspects of evolution. Due to such disagreements, the theory of evolution is seen as tentative and thus not robust, and hence 'just a theory.' In covering various, yet contentious and unresolved, aspects of evolution, Shaikh Mabud (2007, p. 103), for instance, argues for pedagogical transparency when informing students about the scientific integrity of evolution:

Our objective as educators should be to provide a balanced view of evolution to our children, by presenting to them a careful and fair evaluation of the points both for and against the theory. We should not ignore difficulties, anomalies, and alternatives, because they are needed if our children are to make a full assessment of the theory of evolution . . . I have tried to show that there exists a debate in the field of evolutionary biology and that the debate is a genuine one. It has not been resolved during the course of one hundred and forty years, and there is no sign at the moment of its imminent resolution. Let us not pretend that the issue of evolution has been settled once and for all. Let our students not be brainwashed into believing only in the views of a particular group when in fact there is no complete consensus among the scientists. Instead, let us teach them the whole truth.

There are undoubtedly scientific disagreements about the theory of evolution among evolutionary biologists. The most recent example of this is the current debate between Neo-Darwinists and *Extended Evolutionary Synthesists* (also known as the *Third Way*) (Laland et al. 2014; Wray et al. 2014). In the past few decades, there has been a growing number of evolutionary biologists that believe in the inadequacy of Neo-Darwinism. However, for some laypeople, this disagreement is taken to mean that evolution as a whole has been undermined, which is not the case (Huskinson 2020, pp. 149–51). Recall evolution is a multi-propositional theory. The advocates of the Third Way are questioning the adequacy or importance of natural selection and random mutations as the primary causal mechanisms of evolution; they are suggesting alternative causal mechanisms that can either couple with or replace natural selection and random mutations entirely. This is not a debate about *whether* evolution occurred but rather *how* it occurred, a nuance that is sometimes lost in the discussion.<sup>6</sup>

Coming back to Mabud's point, scientific transparency should be encouraged. However, this should be a context-dependent application. Some studies indicate that teachers and students sometimes do not even understand the basics of evolution, let alone technical disagreements (Asgar 2013; Rachmatullah et al. 2018). Moreover, seen pragmatically, discussing every evolutionary debate may not even be feasible given the various teaching and administrative loads of instructors. While transparency should be encouraged, and indeed presenting a neutral standpoint could be encouraging for students to understand the theory better, it remains unclear how exposing students to various technical nuances of evolution might help with their overall understanding of evolution. This is more so the case for students from non-scientific backgrounds trying to evaluate evolution in light of their religious commitments. The graver concern is how exposure to scientific nuances can be (and has been) abused by those opposing evolution. As noted by Peter Bowler (2009, p. 348):

To the critics outside the scientific community, these disagreements are heaven-sent. For them, the failure of the synthesis to impose a lasting consensus reveals the weakness of its claim to offer a truly scientific account of the development of life. Most scientists see the debates as a sign of vitality indicating that they are still grappling with significant issues and trying to resolve their differences. But to anyone not actively engaged in scientific research, an admission that theories cannot be immediately verified looks like a sign of weakness. Religious thinkers, convinced that God created the world directly in its modern form, exploit any sign of dissent among scientists as evidence that the materialistic worldview has major flaws.

Bowler's observation reveals a fundamental problem with adamant critics of evolution, in that the slightest admission of debates in evolution seems to be understood as plus points for anti-evolutionary narratives when that is not necessarily the case.

### 3.2. *The Nature of Science Can Be Misunderstood*

More broadly, confusions arise from not just understanding the science of evolution, but the *nature of science*, too (BouJaoude et al. 2011). Since Newtonian physics came to fruition in the seventeenth century, the benchmark of what makes good science has come to be identified with physics (Rudolph and Stewart 1998; Schizas et al. 2016; DeWitt 2018). For the most part, physics involves constructing experimentally falsifiable, observable, and predictable theories, and its objects of study are manipulable. In other words, it is an *experimental science*. Evolution, by contrast, is a *historical science* (Currie 2018; Turner 2007; Malik forthcoming).<sup>7</sup> Its objects of study are not something that we can analyse here and now. We cannot see extinct species, determine localised events of the past with absolute precision, and observe evolution over the span of 4.6 billion years, as these are largely inaccessible to us from our current vantage point in the present period. In the minds of some, this puts evolution on very tentative foundations, which is why it is sometimes claimed that 'evolution is just a theory' (BouJaoude et al. 2011; Hull 1973).

However, what makes this problematic is not realising some of the meta-principles that govern all scientific thinking:<sup>8</sup> *induction*, *consilience of induction*, and *inference to the best explanation*, to name a few (Currie 2018; DeWitt 2018; Sober 1988). Induction is the process through which we make a general law from a sample of limited observations. Take the simple example of dropping objects. They always go down. After several repeatable instances of this observation, we deduce the principle that things, when dropped, always fall. This is induction in action. Consilience of induction is when we combine several kinds of inductions that lead to the same conclusion. Take the example of a crime scene. We can find traces of DNA, a shoe print, hair strands, and fingerprints that do not belong to the victim. Upon analysis, they all point towards the same person. Taken in isolation, they yield probable conclusions. However, if fortified together, they lend more credibility to the conclusion. In other words, consilience of induction is induction of inductions. Finally, inference to the best explanation, sometimes known as *abduction*, is, after proposing several possible hypotheses, a process of eliminating hypotheses in light of accumulating evidence. Return to the crime scene example. Prior to the inspection, the assigned detective was informed that there were three people known to be in the vicinity when the murder happened. At that point, all three are suspects. But once the analysis is complete, it eliminates the other two and leads to one person.

The preceding discussion links to understanding the *evidence* for the theory of evolution. There are many sub-disciplines that come under the theory of evolution, all of which point to its veracity (Rogers 2011). One of them is palaeontology, the study of the fossil record, i.e., the remains and traces of organisms that once roamed the earth. One famous contention is that the ‘fossil record has gaps.’ This argument suggests that the entire theory of evolution is debunked, since the fossil record is incomplete because it does not have the remains of every single species. There are two problems with this response. First, evolutionary biologists have good reasons for the incomplete fossil record: when biological organisms die, their remains start decaying. It is only under specific circumstances that the remains are preserved (Berra 1990, pp. 31–51; Futuyma and Kirkpatrick 2017, pp. 432–35). Still, evolutionary biologists have uncovered several fossils since the time of Darwin and are still discovering more every year, increasing the resolution of the fossil record (Rogers 2011, pp. 18–25). Second, the fossil record is coupled with other sub-disciplines, such as genetics among others, that only increase our conclusion that evolution has indeed occurred. So, even if considered probable individually, when pieced together, evolution provides a coherent and powerful narrative that explains the evidence available to us (Futuyma and Kirkpatrick 2017; Rogers 2011).<sup>9</sup>

Science works accumulatively through the mentioned meta-principles with technological advancements (DeWitt 2018). Though science can be fallible at times, it is self-corrective, which is why constant rigorous testing is done to ensure that a theory, understood in science as the highest level that a scientific idea can achieve, can stand the test of time.

Given these principles, the theory of evolution stands as the best explanatory framework for all types of biological life that exist today and those that once existed in our history. If the principles of evolution and its evidence, along with the nature of science, are not adequately relayed to the wider society effectively, it may negatively skew one’s thoughts on evolution before one can even begin to consider its implications from a religious standpoint.

### 3.3. Cultural Aspects Can Make Evolution More Challenging to Understand or Accept

Even if a scientific theory is robust, cultural elements can play a significant role in how it is received (BouJaoude 2018; Mansour 2008a, 2008b, 2008c, 2010). It is then not surprising to observe that (Neo-)Darwinism or evolution is a socially or culturally taboo word in many Muslim spaces. For one, linking humans to non-human organisms can be seen as very offensive in some societies. For example, in the Middle East and Southeast Asian cultures, the idea that humans are somehow biologically linked to a dog, for instance, will not be taken lightly, as the word ‘dog’ is used as a derogatory term to insult people.

Also, socio-political configurations also make evolution even more difficult to digest (Asgar et al. 2007). The Israeli–Palestinian conflict, for instance, is a very sensitive issue, which has (somehow) made its way into how some Muslims perceive evolution. Some view evolution through an antisemitic lens, labelling evolution as a Jewish theory or identifying Darwin himself as a Jewish agent of sorts ready to bring about the destruction of the Muslim world (Nadvi 1998; Shavit 2015).<sup>10</sup> In observing the responses to evolution in the nineteenth and twentieth centuries from the Middle East, Shavit (2015, p. 29) notes such sentiments:

A number of Islamists argued, on the basis of the fabricated “Protocols of the Elders of Zion”, that the Jews had propagated Darwin’s theory in order to destroy what remained of faith in Western societies and to subordinate those societies to Jewish interests.

In another study of Muslims in Europe, Hameed (2015) notes how evolution can be seen as an identity marker, the acceptance of which is seen as so antithetical to Islam that accepting it could be interpreted as being a modernist, a secularist, or a colonised subject.<sup>11</sup>

On a related note, Ramadhan et al. (2022) use Paulo Freire’s ideas to argue that Islamic schools, universities, and seminaries should be pedagogically alert and prepared to deal with the problems of evolution. By tapping into Freire’s ideas that education and its institutions are never apolitical, one must be cautious with the underlying baggage that comes with evolution; it is an import of Western science, which is understood here as an aberration. Ramadhan et al. (2022) claim that educating about evolution is one way of culturally invading Muslim societies with a secular and atheistic theory. Accordingly, they argue that creationism must be given due acknowledgement and consideration in Islamic pedagogical settings.

While the validity of a scientific theory should not be judged based on social dynamics and instead should be based on evidence, it must be acknowledged that social settings can play a significant role in how evolution is understood and received in Muslim spaces.

### 3.4. Evolution Is Taken as Entailing or Akin to Atheism

The discussion of evolution has become extremely problematic because of how notable atheists have used evolution to fuel polemical debates with theists. Richard Dawkins, arguably the face of New Atheism, makes it very clear that one can either be an evolutionist or a religious person, but not both (Dawkins 2006; Elsdon-Baker 2009, 2017; Reiss 2008).<sup>12</sup> Given the current evidence, this false bifurcation has become a recognisable cause of Muslims leaving Islam, which is why evolution is seen as a very controversial discussion that ties in with the social identity markers mentioned earlier (Deniz et al. 2008; Cottee 2015; Hameed 2015; Whitaker 2017).

Evolution is seen as an argument against theism in two ways. First, atheists like Dawkins (2006) argue that if we have a scientific explanation for the origins of *life* and *species*, then what need do we have for God? In other words, now that we have a scientific explanation for biological origins, which were previously exclusively attributed to God’s direct act of creation, God seems superfluous. The second argument is a critique of scripture (Qur’ān and ḥadīth<sup>13</sup>). Muslims generally believe that Adam and Eve descended from heaven and were created miraculously as the first human beings on earth and that all of humankind is their children. However, evolution comes into tension with this narrative because it suggests that there exists biological continuity between humankind and the rest of the biological kingdom (Boujaoude et al. 2011). Such arguments fuel the polemics between theists and atheists, and it is for these reasons that critiquing evolution is sometimes seen as a defence of the Islamic faith (Ramadhan et al. 2022).

## 4. Approaches to Islam and Evolution

Given the preceding discussions, it should become clear by now that teaching Islam and evolution is no easy task. The interdisciplinarity of the subject exponentially increases the difficulty of navigating the topic, making it all the more cumbersome for students and



teachers. What makes it even more perplexing are the different approaches that people exercise when looking at Islam and evolution. Though there are many ways to classify approaches, for clarity, two approaches will be mentioned against which the author will compare his own theology-centric approach.

The examples brought forth are relayed by famous individuals who are part and parcel of the Muslim apologetic landscape. This is being pointed out because of Barnes et al. (2021, pp. 14–15), who suggest that one way of helping with understanding or accepting evolution is by referring students to Muslim scientists who have no problem with evolution. One example is Fatimah Jackson, a Muslim biologist and anthropologist and winner of the Charles R. Darwin Lifetime Achievement Award from the American Association of Physical Anthropologists. Another is Rana Dajani, a molecular biologist listed in the influential magazine *The Muslim 500* (Schleifer 2022, p. 174), who believes that Islam and evolution are perfectly compatible (Dajani 2012, 2016). While the helpful nature of this suggestion is not being denied, this presumes that Muslim scientists are the only individuals that sway public or students' opinions and that all Muslim scientists support evolution. Other Muslim actors in the field are equally famous, if not more, and carry a lot of weight in some Muslim spaces, particularly cyberspace. This further complicates the social influences that make their way into classroom settings.

#### 4.1. Approaching Evolution through Science on Its Own Terms

The first approach takes the science of evolution as its starting point. For those who see it as problematic for Islam, this is usually done to make the science of evolution look poor in its integrity. It is then dismissed so as to have no consequences for the Islamic faith. Contentions like 'evolution is just a theory', or there are 'gaps in the fossil record,' as reviewed earlier, are but some of several examples used to make this case. Qunaybī (2012), a well-known scientist from Jordan, takes this approach in his YouTube series called *The Journey of Certainty (Rihlat al-Yaqīn)*.<sup>14</sup> Though the motivations behind such approaches can be multifaceted, one clear advantage of presenting this way is that it makes the approach look like it has scientific merit. In other words, evolution is being debunked on its own (scientific) terms.

By contrast, although adopting a similar approach, others do not necessarily believe that just because the science of evolution is weak or false necessarily means that it has no implications for the Islamic faith. Ḥusayn al-Jisr, a well-known Sunnī Lebanese theologian from the nineteenth century, evaluated the science of evolution according to developments of the day. He found the theory to be wanting, given the literature of the evidence that was available back then, and therefore, rejected it. However, he did not rule out the possibility of the theory becoming firmer over time, which, if it did, he was open to exploring theologically (Al-Jisr 2012; Elshakry 2013; Shavit 2015).

#### 4.2. Approaching Evolution through Philosophy of Science

The second approach takes the developments in philosophy of science as its primary frame of reference. There is a particular discussion in philosophy of science known as scientific realism. This is a big topic, but for present purposes, we can suffice ourselves with the understanding that it involves analysing what and how much we are committing to in a scientific theory. Do scientific theories give us true or accurate and justifiable depictions of the world? Or are scientific theories merely tools or instruments that give us calculative control? Crudely put, scientific realists say yes to the first question and no to the second, while it is vice versa for scientific antirealists (Chakravartty 2017; Wray 2018). In relation to evolution, scientific realism implies that evolution is true and therefore does have implications for the Islamic faith. However, if one interprets it antirealistically, then it has no consequences for the Islamic faith. Subboor Ahmad (2016), a British Pakistani who works for the *Sapience Institute*,<sup>15</sup> highlights this nuance, not necessarily to debunk or undermine evolution, but to expose another essential layer in the conversation of Islam and evolution.

#### 4.3. Approaching Evolution through Theology

Against these two approaches and given the problems that were identified earlier, it will be argued that adopting a theology-centric approach is a much better alternative. From the author's perspective, both approaches discussed earlier are being utilised because evolution is being seen as a potential or actual threat to the Islamic faith. However, they fail to illuminate potential options in the theological plane that could be identified through which the tensions between Islam and evolution can be punctuated.

Let us start by explaining the term 'theology' (*ʿaqīda*) in this context. Islam, like other religions, has various groups under its umbrella. Broadly and non-exhaustively, there are Sunnīs and Shīʿīs. These are two broad doctrinal camps that establish specific faith commitments that their followers need to have. Under each, there are further subdivisions. In Sunnī Islam, there are three key schools of doctrine. These are Ashʿarism, Māturidism, and Atharism/Salafism (Jackson 2009). The author personally identifies as an Ashʿarī and mostly aligns with the perspective of Abū Hāmid al-Ghazālī, one of the most famous theologians of this group. The arguments and conclusions being presented in this article, however, are not necessarily exclusive to Sunnism, Ashʿarism, or al-Ghazālī's thoughts, but the positionality is being stated because the author believes it is crucial to make one's theological commitments explicit. It will be left to advocates of other positions to define their own narratives.

The function of theology is to safeguard one's beliefs so that one has attained salvation in the eschaton, which is the goal of every Muslim (Al-Ghazālī 2003, 2013). The aforementioned theological schools are creedal packages that constructively attempt to define what are primary, secondary, and irrelevant matters for one's faith. An example of a primary belief would be the status and the role of Prophet Muḥammad in Islam. Believing in the existence, integrity, and finality of Prophet Muḥammad as the last messenger is a fundamental belief, the rejection of which would warrant the charge of disbelief (*kufr*). The treatment of authentic *aḥād* ḥadīth could be an example of a secondary issue.<sup>16</sup> Rejecting a claim about God or the unseen realm (*ʿilm al-ghayb*) in an authentic *aḥād* ḥadīth, without a reason to doubt its veracity, would count as an unsanctioned innovation (*bidʿa*), which is sinful (*ḥarām*) but does not count as disbelief. Both primary and secondary beliefs have repercussions in the eschaton, the former being more severe than the latter (Al-Ghazālī 1961, 2002). Finally, the existence of dinosaurs or aliens is not a theological issue, as Islam has nothing to say about this. So, if one were to either believe or disbelieve in their existence, it would not have any eschatological consequences (Jalajel 2018; Malik 2021, pp. 267–95).<sup>17</sup> With this made clear, the next question to explore is: within the context of evolution, what can a Muslim accept and reject as a Muslim?

The answer to this question, and any other query in Islam and science more broadly, has two parts. The first is *metaphysics* (*ʿilāhiyyā*). Metaphysics is a tricky word to define, but it mainly encompasses the following two meanings. One meaning of metaphysics is beyond the physical world. This could include discussions about God, angels, heaven, and hell. A broader meaning of metaphysics is an understanding of reality at the fundamental level, i.e., understanding *what* there is and *how* it is. So, for example, the metaphysics of the physical world involves identifying and understanding that there is a physical reality and attempting to understand its nature, which consists in looking at all kinds of ideas such as time, space, matter, laws of nature, and so on.

From a theological perspective and in relation to science, what matters metaphysically are three things: (1) the nature of God, (2) the nature of creation, and (3) the relationship between God and creation. In Ashʿarī theology, God is an utterly transcendent being. He is immaterial, non-temporal, eternal, omniscient, omnipotent, and volitional. Fundamentally, He is a necessary being (*wājib al-wūjūd*). In direct contrast to God, creation and all its constituents are contingent (*imkān al-wūjūd*). All contingent beings are known to God's knowledge and under his direct will and power, and He can manifest them in whatever way He pleases. God is understood to be able to do anything that is logically possible (*ḥāz al-aqlan*). The only thing not seen as an object of God's power is a logical impossibility, e.g.,

a square circle (Malik and Muhtaroglu 2022). Accordingly, He can create a world with regularities, as ours is, but He can also equally create a world with different laws of nature and no laws of nature at all. All of these are in the realm of God's power. He can also localise certain events that go beyond the laws of nature, i.e., miraculous events, which is why Ash'arīs accept the reality of miracles (Al-Ghazālī 2013; Malik 2021, pp. 179–211).<sup>18</sup> From a metaphysical perspective, the following questions need to be asked:

1. Can God create a world with the characteristic of deep time?
2. Can God create a world wherein He manifests common ancestry?
3. Can God create a world wherein He manifests patterns of natural selection and random mutations?

The second discussion is *scriptural* (*sam'īyyāt*). In relation to science, the scriptural discussion is about determining two things. The first part is understanding what God has *affirmed*, *negated*, and *not mentioned* from the realm of the unseen. The second part is determining when to interpret things literally and figuratively.

The realm of the unseen includes, within it, metaphysical (understood here as non-physical) as well as historical realities. Examples of the former include God *affirming* the existence of heaven, hell, angels, and demons, to name a few. The latter consists of the *affirmation* of individuals (e.g., Adam, Eve, Moses, and Mary) and events (e.g., the stories of the prophets) that existed in the distant past. Equally, in some cases, God *negates* certain realities. For example, it says in the Qur'ān that Jesus did not die on the cross (Q. 4:157). It is also important to point out that if scripture does not discuss a given topic, i.e., *neither negates nor affirms*, then no theological opinion can be made of it (*tawāqquf*). In the discussion of aliens and dinosaurs mentioned earlier, they are theologically irrelevant because there is no mention of their existence or non-existence in scripture. Had God affirmed or negated them in scripture, it would be a theologically binding position (Jalajel 2009, 2018).

Keeping idioms and cultural references in mind, and unless the context permits, Ash'arīs read what God has *affirmed* and *negated* literally, even if they are not scientifically determinable or sensible. The mentioned examples are doctrinally bound realities to which Ash'arīs subscribe because God has revealed them, and the language and context do not permit us to read them otherwise (Malik 2021, pp. 269–95). Accordingly, Ash'arīs have no problem believing the standard creation account of Adam and Eve as miraculous creations, as well as the miraculous creation of Jesus and the plethora of miracles of the prophets mentioned in Islamic scripture. This works in tandem with Ash'arī metaphysics discussed earlier. In relation to evolution, what needs to be determined are the following:

1. Does Islamic scripture affirm, negate, or mention nothing of *deep time*?
2. Does Islamic scripture affirm, negate, or mention nothing of *common ancestry*?
3. Does Islamic scripture affirm, negate, or mention nothing of *natural selection* and *random mutations*?

In the author's previous work, it is argued that, given Ash'arī metaphysics, it is perfectly possible for God to create a world that has the characteristics of deep time, common ancestry, natural selection, and random mutations (Malik 2021, pp. 179–211). In other words, there is nothing metaphysically troubling with any of the three propositions that make up Neo-Darwinism.

Some may contend that evolution entails the negation of God. Evolution is sometimes interpreted this way because of the words 'natural' in natural selection and 'random' in random mutations. To the minds of some, if not most, these terms imply that nature is the sole force driving the process; therefore, God is removed from the picture. However, such claims can only be problematic if evolution is interpreted through *philosophical naturalism* (Audi 2009). This is a metaphysical position which claims that nature is all there is, i.e., supernatural entities like God do not exist (Draper 2005). If seen through this perspective, it is then no surprise to see Muslims are weary of accepting these ideas. But it is precisely through this lens that famous scientists like Richard Dawkins (2006) present evolution. Ash'arism is fundamentally opposed to philosophical naturalism, as it is a theistic meta-

physical framework, i.e., it believes that there are things beyond nature, such as God. At the centre of Ash‘arī metaphysics is the idea that everything in creation is created and sustained by God’s power. If God chose to create species through the process of what is referred to as natural selection, then this is not a problem. Natural selection does not entail philosophical naturalism. Furthermore, through philosophical naturalism, random mutations could be seen as blind and non-governed chances in the process, leading to no end goal. This contradicts the purpose of man as defined by Islamic scripture.<sup>19</sup> However, in Ash‘arī metaphysics, evolution may look random to us from our human perspective, but they are not for God, who controls and knows everything. Otherwise, tossing a coin, which is also random, i.e., it is not possible to predict exactly on which side a coin will land on a particular toss, would result in heresy. Coincidental meetings would also be problematic!<sup>20</sup> In other words, there is a big difference between the human vantage point and God’s. Therefore, natural selection and random mutations could easily be understood as laws of nature that God created like any other law of nature we see in our universe, making Neo-Darwinism perfectly acceptable under an Ash‘arī framework. Seen this way, any atheistic instrumentalisation of evolution used against the Islamic faith immediately loses its force (Malik 2021, pp. 179–211).

From a scriptural perspective, the Qur’ān and ḥadīth have nothing to say about deep time nor natural selection and random mutations. One could argue that the Qur’ān does mention six days (*sittat ayyām*).<sup>21</sup> However, the Arabic word rendered as days is *ayyām*, which is semantically elastic and open to referring to any span of time.<sup>22</sup> As for common ancestry, there is nothing in Islamic scripture that talks about the creation of non-humans apart from general references such as all life being created from water (Q. 21:30) (Malik 2021, pp. 88–105). The only thing that is discussed is the creation of Adam and Eve, who are held to be the progenitors of all humans today. Therefore, the main source of contention is how Adam, Eve, and all humans fit into common ancestry. This has been summarised in Table 1.

**Table 1.** Evaluation of Neo-Darwinism.

Scientific Idea	Metaphysically Possible?	Scripturally Compatible?
Deep Time	✓	✓
Common Ancestry	✓	?
Natural Selection	✓	✓
Random Mutations	✓	✓

Note: “✓” means affirmation and “?” means uncertain.

Given that common ancestry is the main contention, and given several opinions by Muslim scholars, the author developed a unidimensional taxonomy that exclusively focuses on it, as summarised in Table 2 (Malik 2021, pp. 106–54), with the differences between human and Adamic exceptionalism illustrated in Figure 1.

**Table 2.** Classification for Islam and evolution.

Position	Are Non-Humans a Product of Evolution?	Are Humans a Product of Evolution?	Are Adam and Eve a Product of Evolution?
Creationism	✗	✗	✗
Human Exceptionalism	✓	✗	✗
Adamic Exceptionalism	✓	✓	✗
No exceptions	✓	✓	✓

Note: “✓” means affirmation and “✗” means negation.

Creationism and the no exceptions camp are complete opposites of one another. As mentioned earlier, creationism is the stance that common ancestry is entirely false, as God made each species directly and miraculously. The no exceptions camp believes evolution applies to all biological life and thus permits no special pleading for Adam, Eve, and humans.<sup>23</sup>

Human exceptionalism is the position that common ancestry is true except for human beings. In this perspective, Adam and Eve are considered the first members of humankind, and since they were created miraculously, they and their entire progeny are exempted from the process of evolution. This position is held by Qadhi and Khan (2018), for instance, and they reconcile it as follows. For them, God miraculously created Adam and Eve at the expected moment when humans were supposed to spring forth through evolutionary pressures. Subsequently, the fossil record appears like a seamless continuation of evolutionary processes that includes human history when looked at scientifically. From a theological lens, however, Adam and Eve's miraculous creations were real metaphysical events as depicted in Islamic scripture. For Qadhi and Khan (2018), this does not lead to a conflict as such, as these two ideas occupy different disciplinary modalities: "The occurrence of such a scenario is theologically plausible and would be impossible to disprove empirically since it is a metaphysical assertion".

Adamic exceptionalism agrees with human exceptionalism in so far that Adam's and Eve's miraculous creations are retained. However, it also maintains that scripture is compatible with the possibility of there being pre/co-Adamic members of *Homo*<sup>24</sup> on earth whenever Adam was created miraculously. It also maintains that it is scripturally compatible with the idea that some of Adam's descendants could have interbred with them.<sup>25</sup> This position's validity is argued by David Solomon Jalajel (2009, 2018). The differences between human and Adamic exceptionalism are shown in Figure 1.

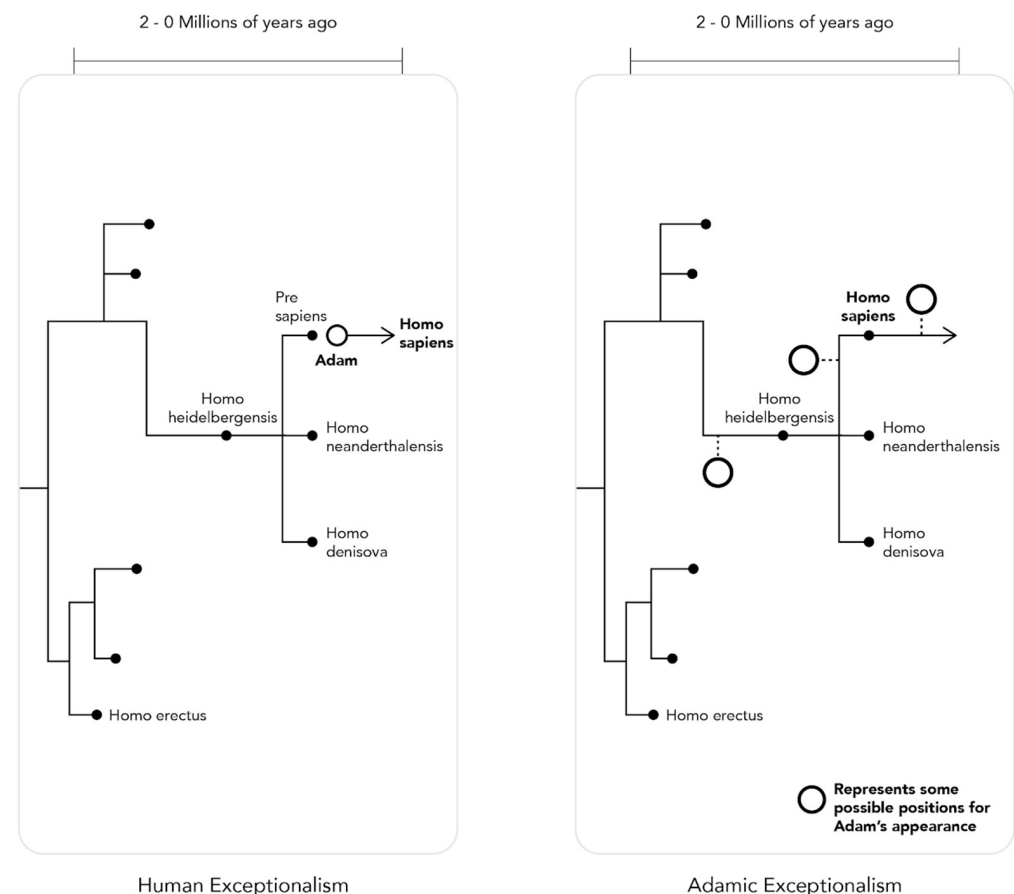


Figure 1. The difference between human (left) and Adamic (right) exceptionalism.<sup>26</sup>

To evaluate these positions, the two discussion points on metaphysics and scripture need to be investigated. As already mentioned before, metaphysically, all the positions in Table 2 are possible under Ash‘arism. To determine the scriptural possibilities, it needs to be made explicit what Islamic scripture mentions and does not. Given scriptural details, Ash‘arism entails commitments to the following propositions (Malik 2021, pp. 87–105):

- a. Adam is a real historical person
- b. Eve is a real historical person
- c. Adam and Eve were created miraculously
- d. All humans today lineally go back to Adam and Eve<sup>27</sup>

Given the *lack of* scriptural mention, Ash‘arism is uncommitted to the following propositions (Malik 2021, pp. 87–105):

- a. *When* Adam and Eve existed
- b. *What co-existed*, e.g., other members of the genus *Homo*, at the time of Adam and Eve
- c. *What interactions* did Adam and Eve’s descendants have with other members of the genus *Homo*, e.g., interbreeding or intermarrying

Accordingly, creationism, human exceptionalism, and Adamic exceptionalism are valid options, but not the no exceptions position, as summarised in Table 3. Despite the no exceptions position being metaphysically possible, because it does not align with scripture, it is a position that cannot be accepted given the weight of scriptural backing in Ash‘arī theology.

**Table 3.** Evaluation of the different positions.

Position	Metaphysically Possible?	Scripturally Compatible?
Creationism	✓	✓
Human Exceptionalism	✓	✓
Adamic Exceptionalism	✓	✓
No exceptions	✓	✗

Note: “✓” means affirmation and “✗” means negation.

It could be argued that the multiplicity of possibilities or determining an exact stance is an unsatisfactory outcome. In science, something is either the case or not. Subsequently, evolution must either be true or not. So why is there an open stance in theology? Here, we must appreciate that science and theology are not the same thing and do not occupy the same goals. The goal of theology is to establish a set of commitments that will have consequences in the Hereafter or life after death (*ākhirā*). (Al-Ghazālī 2016, 2018). Anything else is theologically neutral, i.e., Islam has nothing to say about it. Whether one accepts or rejects the fossil record, periodic table, dinosaurs, the formation of the black holes, and multiverses, among other things, none of which are mentioned in Islamic scripture, have no consequences in the eschaton. Accordingly, whether one believes in these things or not would be a *personal* or *scientific* opinion, not a theological one. Therefore, if one does not find evolution convincing for whatever reason(s), one can be a creationist, and, equally, if one finds the evidence for evolution convincing, one can be a human or Adamic exceptionalist.

#### 4.4. Benefits of a Theology-Centric Approach

There are several benefits to approaching the question of evolution through the lens of theology. In comparison to fixating on the science of evolution, theology just makes explicit one’s religious commitments that are relatively easy to determine. By contrast, the author has noticed that sometimes students will bring up several kinds of disagreements with evolution to show that it is flimsy and therefore does not warrant any religious consideration. Sometimes, the objections are valid, and other times they are not. Two points will be mentioned in this regard.

First, even if something is not robust given our current knowledge, it does not mean that it will always be the case. In other words, relying on contemporary knowledge gaps or disagreements among evolutionary biologists is a *tentative* argument. It may be that future discoveries might solve the scientific puzzles that we are currently facing. Equally, it must be conceded that some inquiries might never get resolved. However, fundamentally, this approach is bound to the developments of the day that require constant monitoring. Pragmatically, it is not a long-term solution, and definitely not one that should be shouldered by the average Muslim who may not be able to navigate the material. By contrast, theology sets down the *absolute* limits of what a Muslim can and cannot believe, which makes it conceptually less taxing and more pragmatic for the average Muslim<sup>28</sup>. If the proofs of evolution get stronger by the day, human or Adamic exceptionalism can be maintained. If evolution gets undermined one day, creationism is still valid.

Second, sceptics have a barrage of arguments at their disposal taken from creationist literature. Accordingly, even if contentions are resolved, there will always be others that can be brought up, leading to an endless cycle. Furthermore, some students get so caught up with the minutiae in science that several hours are wasted discussing the scientific veracity of technical arguments. Being thorough should be strongly encouraged. Still, when trying to look at a conversation that affects one's faith, there is a scientific threshold after which it simply becomes a debate of science as opposed to science and religion, and thus superfluous. This is why the author tries to keep the science of evolution as accessible as possible and reduce evolution to the three propositions mentioned at the beginning of this article, which is enough to start the theological assessment; further minutiae become extraneous.

More importantly, the author has observed that students sometimes quote technical papers on evolutionary biology without fully understanding them, claiming that such papers undermine evolution. A clear case in point is materials written by advocates of the Third Way. Recall that this movement has disagreements with Neo-Darwinism about the causal mechanisms of evolution. The author had to personally contact some members of this movement, e.g., Eva Jablonka and James Shapiro, so that it can be demonstrated unambiguously that they are not rejecting *whether* evolution occurred, only *how* it occurred (Theology 2021).

As for the philosophy of science approach, it seems to be a distraction from the conversation. The contention will be made clear with an example. Take the case of the multiverse. This is the idea that, in addition to our own, there are several other universes. Does this scientific idea contradict Islam? To assess this claim, we need to go back to the two-prong filter test. Is it metaphysically possible? Yes, God could create multiverses. Is it scripturally conflicting? No, scripturally does not mention anything about multiverses.<sup>29</sup> Accordingly, whether one believes in the multiverse or not is theologically neutral. This is a significant finding because, currently, there is no evidence for the multiverse (Kragh 2011). In other words, it is entirely hypothetical at this stage, yet we were able to determine how much it impacts a Muslim's religious commitments.<sup>30</sup> Thus, *an individual does not have to wait for a theory to be absolutely true to determine its theological implications*. This leads back to the earlier points regarding the debates about the science of evolution. If the general contours of evolution are understood, one does not have to assess and be convinced of every detail of evolution to determine its theological impact.<sup>31</sup>

From those with creationist leanings, it could be countered that perhaps the approach presented here is giving too much credit to the science of evolution and bending theology to fit the narrative. First, if this were the case, the author would not be defending the theological plausibility of creationism. As stated earlier, creationism is a perfectly acceptable position on theological grounds. Second, on the contrary, the author is taking theology seriously and seeing what can be accepted based on that framework. The theory of evolution, particularly the idea of common ancestry, was never discussed nor imagined before the nineteenth century in Muslim discourses.<sup>32</sup> This new idea requires reconsidering longstanding beliefs, particularly if they have credal implications.<sup>33</sup> Thus, there is no

bending of theology, but rather testing theological parameters in light of new ideas that were not known before.

From the no exceptions camp, it may be contended that the science of evolution is being undermined by entertaining creationism, and human and Adamic exceptionalism, as miracles are unscientific. Two things can be said about this. First, if the contention is against the veracity of miracles, then that is not a scientific disagreement but a theological one. Sunnīs and Shīʿīs, i.e., the majority of Muslims, believe in the possibility of miracles due to theological commitments. Moreover, negating miracles based on what science claims would be seen as a commitment to philosophical naturalism, which we looked at earlier, or *scientism*, which is an ideology positing that science has answered or will be able to answer all questions eventually (Stenmark 2001). Neither of these would be tolerated seriously from a theological lens (Malik 2021, pp. 296–337). Second, human exceptionalism and Adamic exceptionalism have their respective defences that cannot necessarily be undermined *scientifically* (Malik forthcoming; Swamidass 2019), the details of which need not be repeated here.

For these reasons, the author finds a theology-centric approach easier and more effective to administer in pedagogical settings, and it is one that both students and teachers of Islam and evolution (and Islam and science more broadly) can appreciate. To be sure, the author does not claim that the science of evolution or philosophy of science are unimportant in the conversation, but only that they play a secondary role in relation to theology, which is where the main contentions seem to be.

## 5. Conclusions

This article identified the general propositions of evolution, followed by a review of the various kinds of contentions that Muslims might have with evolution. These contentions were highlighted to acknowledge the various kinds of impediments one can observe in the pedagogy of Islam and evolution.

Though not always easy to address, it is important to highlight the main principles of evolution and clarify any misconceptions that students may have. However, this should not be the sole focus. Simply delivering better education on the science of evolution or the nature of science will not necessarily eliminate the theological worries that will arise in the minds of Muslim students. While some may be misinformed about the science and thus reject it, others may not want to entertain it simply because they believe it runs against their theological commitments.

Here, a theology-centric approach can help significantly, and in the author's experience, it has.<sup>34</sup> Given that and the suggestions made in this article, the following is a simple guideline for developing an *interdisciplinary* course on Islam and evolution that, depending on the context, can be moulded in several ways:

1. Keep the science simple and accessible:<sup>35</sup>
  - a. Deep time
  - b. Common ancestry
  - c. Mechanisms
2. Present the various opinions on evolution:<sup>36</sup>
  - a. Creationism
  - b. Human exceptionalism
  - c. Adamic exceptionalism
  - d. No exceptions
3. Present and evaluate the various opinions in light of the *adopted* theological perspective(s):<sup>37</sup>
  - a. Metaphysics<sup>38</sup>
  - b. Scripture



To be sure, this article does not intend to slight other approaches and theological positions. Rather, it hopes to provide one approach based on a particular theology paradigmatically for students and instructors alike.

This work can also aid researchers looking into the pedagogy or reception of evolution and science in Muslim spaces more broadly. Being aware of the theological aspects of the discussion, as well as the religious affiliations of Muslims, can help further the resolution of the literature on Muslims' reception of scientific ideas like evolution.

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## Notes

- <sup>1</sup> Care should be taken here. Abiogenesis is the discipline that studies the origins of *life*. By contrast, evolution studies the origins of *species*. Evolution does not explain how *life originated*, which is what abiogenesis does, but it does depend on there being an origin of life, without which evolution cannot occur. Misunderstanding this point creates potential obstacles in the understanding of evolution.
- <sup>2</sup> The author is currently developing a textbook and a micrograph on the pedagogy of the subject matter. Both are coming out with Routledge.
- <sup>3</sup> To a large degree, the approach to science education from an Islamic perspective being articulated here is similar to Qureshi (2021).
- <sup>4</sup> It should be noted that creationism can be understood *broadly* and *narrowly* (Ruse 2018). The broader thesis is that God created everything, in which case all Islamic creeds have a creationist understanding. However, creationism in the narrower sense is the antithesis of common ancestry, i.e., the thesis that God created each species instantaneously and miraculously. Here, there is disagreement (Malik 2021).
- <sup>5</sup> Unfortunately, this image is widespread in popular media, which is why it still has a lot of social clout that frustratingly perpetuates this myth.
- <sup>6</sup> To be sure, this debate does not seem to be settled (Uller and Laland 2019). Furthermore, this example on its own should not be taken to mean that other aspects of evolution are problem-free. See Doolittle and Bapteste (2007) and Willis and Bell (2018) for healthy scientific disagreements regarding common ancestry, for instance.
- <sup>7</sup> The division between experimental and historical science should not be taken as rigid and thus non-overlapping distinctions. After all, astronomy, which is a child of physics, involves the study of the age of the universe.
- <sup>8</sup> As well as ordinary, day-to-day affairs, with one key difference that science involves highly sophisticated machinery.
- <sup>9</sup> On a related note, see Malik (2021, pp. 48–49) about the criticism that evolution is not falsifiable.
- <sup>10</sup> The author was once explicitly (and confrontationally) asked on social media why he was supporting and discussing a 'Jewish theory'.
- <sup>11</sup> In tandem with such opinions, the Islamisation of Knowledge project, one of the first movements that set the stage for the development of Islam and science as a field of study, questioned the scientific import of science in the Muslim spaces, as it came loaded with modernistic presumptions. Some members of this movement, such as Seyyed Hossein Nasr, viewed evolution through this lens (Loo 2001).
- <sup>12</sup> There is a well-known incident of Dawkins visiting Madani High School, a Muslim faith school in Leicester, UK. After attending the school and observing its stance on evolution, he said that "Muslim faith schools fill children's heads with 'alien rubbish' as they continue to teach them creationism is true" (BBC 2011). Interestingly, when Dawkins asked the science teacher about human–chimpanzee ancestry, she responded by saying that humans come from apes, the common misconception that was reviewed earlier (Inayatcorner 2011).

- 13 These are recorded sayings, actions, and tacit approvals of the Prophet Muḥammad. Ḥadīths are accompanying scriptural resources for Muslims, but not all of them have the sturdiness of the Qurʾān's historical integrity. A whole independent discipline known as principles of ḥadīth (*uṣūl al-ḥadīth*) was developed through which the narrated ḥadīth accounts were scrutinised to determine their degree of validity. Three key categories emerged, based on the level of soundness. These are sound (*ṣaḥīḥ*), good (*ḥasan*), and weak (*ḍaʿīf*). Two other broad categories are based on the number of narrators are *mutawātir* (successive narrations by numerous chains and transmitters) and *āḥād* (singular narrations) also known as *khābar al-wāḥid* or *khābar aḥādī*. While *mutawātir* narrations are of the highest order of authenticity, *āḥād* remain epistemically weaker with several subcategories. Only the Qurʾān and a limited number of ḥadīths meet the *mutawātir* criteria; the majority of ḥadīths are of *āḥād* type. See [Brown \(2009\)](#) for more details.
- 14 His account currently boasts 1.52 million subscribers on YouTube with more than 90 million views.
- 15 This is potentially the largest Muslim apologetics institute in the English-speaking community and is an offshoot of the *Islamic Education and Research Academy* or better known as iERA. See [Baz \(2017\)](#).
- 16 As a reminder, read Note 13.
- 17 It should be noted that the boundaries of primary, secondary, and non-creedal issues may vary from one theological group to another and from one thinker to another.
- 18 This will be of importance when looking at the creation narrative of Adam and Eve in scripture.
- 19 See Q. 51:56.
- 20 Also, in the minds of some, random mutations mean *unconditional* mutations, i.e., bound by nothing. Mutations can only occur in the available genetic material and are thus *conditional*.
- 21 See Q. 7:54 and Q. 10:3.
- 22 You can see the different usages in Q. 22:47 and Q. 32:5.
- 23 Various authors argue for this position, e.g., [Dajani \(2012, 2016\)](#).
- 24 *Homo* is a wide genus, which encompasses us, *Homo sapiens* (modern humans), and several extinct species ancestral to or closely related to modern humans, e.g., *Homo erectus*, *Homo neanderthalensis*, and *Homo denisova*. See [Cartmill and Smith \(2022\)](#) for further details.
- 25 Scientists have determined that *Homo neanderthalensis*, which went extinct 40,000 years ago, interbred with *Homo sapiens*, as indicated by recent genetic findings ([Neves and Serva 2012](#); [Villanea and Schraiber 2019](#)). Even more interestingly, the Swedish geneticist Svante Pääbo at the Max Planck Institute for Evolutionary Anthropology in Germany won the Nobel Prize in 2022, the time of writing this article, for his research on the interbreeding between *Homo sapiens* and other archaic human ancestors ([Lewis 2022](#)). Where Adam and Eve could fit in all of this is difficult to determine, as it is unclear how the theological terms '*insān*' and '*bashar*' map on to the biological terms. Hence the various options within Adamic exceptionalism as presented in Figure 1. For an excellent analysis of the difficulties of correlating theological and biological categories in the context of human evolution, see [Kemp \(2011\)](#). For further explorations in this area, see [Cole-Turner \(2020\)](#), [May \(2022\)](#), and [Moritz \(2011, 2015\)](#).
- 26 Both images show the branching process of various human ancestral lines under the genus *Homo*, leading up to modern *Homo sapiens* (modern humans). In human exceptionalism, there is no lineal connection between the preceding species and *Homo sapiens*. It shows Adam appearing into existence, from which the *Homo sapiens* line starts and continues to the modern period. In Adamic exceptionalism, humans do have human ancestors. It shows Adam appearing in existence at multiple possibilities between *Homo heidelbergensis* and *Homo sapiens*, illustrating that only Adam was a miraculous creation. It should be noted that this is not an accurate *scientific* sketch and should only be understood pedagogically to help illustrate the differences between human and Adamic exceptionalism.
- 27 Therefore, any scenario in which a modern human being is not a descendent of Adam and Eve, i.e., a non-Adamic line, cannot be true. See [Swamidass \(2019\)](#) for more details.
- 28 Of course, there will also be inevitable disagreements in the theological discussions. [Al-Qaraḍāwī \(2009\)](#) and [Ḥusayn Al-Jisr \(2012\)](#) rejected evolution but agreed with its compatibility with Islam *in principle*. By contrast, [Al-Būṭī \(1997\)](#) rejected it categorically, while Nuh [Keller \(2011\)](#) only rejected human evolution categorically. The framework of David Solomon [Jalajel \(2009, 2018\)](#) caters for all possibilities between creationism and Adamic exceptionalism. Interestingly, all five are operating through the Ashʿarī framework. For reviews of other scholars, see [Howard \(2011\)](#), [Ibrahim and Baharuddin \(2014\)](#), [Malik and Kulieva \(2020\)](#), and [Shavit \(2015\)](#).
- 29 Some might bring up Q. 1:2 to argue the contrary: "Praise belongs to God, Lord of the Worlds (*ʿālamīn*)". The word "*ʿālamīn*" means worlds or creations, and it would be anachronistic to suggest that it means multiverses. It could be extended to mean multiverses but not with any definitiveness.
- 30 It should be added that some interlocutors may use notions of God's wisdom, which is used here as a theological axiom, to determine whether multiverses exist. Some may resort to God's wisdom to prove the necessity of multiverses, e.g., by arguing that multiverses reflect God's creative design even more. Critics may say that multiverses are superfluous and thus undermine God's wisdom. The problem with both sides is that they use subjective and humanly constrained notions of design to arbitrate scientific theories, which is highly problematic in Ashʿarī theology. For an excellent reference on how arbitrating the validity of evolution (and any other science) using God's wisdom is problematic from a broader Sunnī lens, see [Jalajel \(2022\)](#).

- 31 This comes with the caveat that determining the minimum, accessible content of the required science varies from one interface to another. Sometimes, the line is unclear, particularly in areas related to human consciousness and personhood.
- 32 For a discussion of proto-biological perspectives in early Islamic thought, see Malik (2019).
- 33 However, the author concedes that some interlocutors may occupy different theological frameworks and scriptural mechanisms that do not allow the possibilities that have been entertained here.
- 34 It is why the author does not believe that *just* focusing on the science of evolution is a constructive proposal. Since this is an interdisciplinary issue, neither the science of evolution nor Islamic theology can be undermined. Failing to recognise this will only do injustice to the broader pedagogy of Islam and science. For a similar argument, see Reiss (2008).
- 35 The simplicity being suggested here is predicated on the assumption that students have no or little background in biology. This is obviously not the case for standalone (evolutionary) biology courses, either in schools or universities, in which the details go beyond these three principles. Also, this section should try to clarify any misconceptions that students might have. Finally, a component on the nature or philosophy of science could be added to this section, though this will depend on the context and resources involved.
- 36 Other classifications could be adopted as well. See Malik (2021, pp. 106–12).
- 37 This will vary from one setting to another, as it will depend on the adopted belief systems of the students and instructors involved.
- 38 This section could also include highlighting the metaphysical differences between the adopted theistic perspective and philosophical naturalism.

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