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A New Theistic Argument Based on Creativity

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Abstract: It has been argued for a long time that God has been involved in the biological evolutionary processes observed on Earth. However, no convincing theistic argument has yet been formulated for biological evolution. In this article, I use the concept of creativity to argue that biological evolution manifests an embedded intelligence. This articulates a new form of theistic argument related to biological evolution and offers another sound argument supporting the existence of God. My reasoning suggests that nature might be panentheistic, or that an external personal God manipulates natural laws to direct the process of evolution.

Keywords: theistic argument; evolution; panentheism

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1. Introduction

Some arguments favouring the existence of God have been postulated in the last few decades in studies related to science and religion, such as the fine-tuning argument (Swinburne 1998; McGrath 2009), the intelligent design argument (Meyer 2009), and the Kalam cosmological argument (see the review in Craig 2008). These theories are derived from the known properties of life and nature. For example, scientists proposing the fine-tuning argument discovered that many fundamental constants in our universe are fine-tuned to support the existence of life (McGrath 2009, pp. 119–21). Life would not have evolved if the values of these constants were changed by minuscule amounts. Classical theism can also offer an appropriate explanation for fine-tuned constants, enabling this property of nature to endorse the existence of God (e.g., see the fine-tuning argument in Swinburne 1998).

However, the relevant theistic arguments for the biological evolution of life are less convincing. That the process of biological evolution is pivotal in generating life diversity is widely accepted, but it is difficult to apprehend the role of God in this evolutionary process. In particular, some previous studies have argued for the existence of teleology in evolution (McGrath 2009, pp. 194–99); however, the concept of teleology or divine purpose in biological evolution has been criticised by some impactful scientists (e.g., Dawkins 2008) and philosophers (e.g., Sober 2003). The major criticism is that it is not easy to define or identify the alleged purpose shown in biological evolution (see Jantzen 2014, pp. 153–69). Therefore, the theistic argument formulated for biological evolution is undermined. The general scholarly term 'theistic evolution' is invoked to describe the metaphysical connection between God's creation and biological evolution (see the introductory review in Meyer 2017, pp. 33–49). For example, Collins (2006, p. 201) believes that God chose the elegant mechanism of evolution to create microbes, plants, and animals. This is one of the general beliefs of theistic evolution. However, strictly speaking, theories of theistic evolution are not rigorous philosophical arguments. Even in the field of theology, theistic evolution has been criticised by many theologians. Specifically, it is not clear how to reconcile the tensions between evolution and Christian doctrines (e.g., Allison 2017; Grudem 2017).

Conversely, advocates of the intelligent design theory focus on particular features of the traits found in life rather than the entire process of biological evolution. They argue

that life encompasses certain irreducible or specified complexities that cannot be explained by random or law-like processes (Meyer 2009, pp. 271–95). The probability of naturally achieving such exclusive or distinctive intricacies is so extremely small that the existence of an intelligent designer is the only viable explanation. Nevertheless, this argument is criticised by many philosophers and scientists. For example, the idea of irreducible or specified complexities is difficult to define (Jantzen 2014, pp. 207–25). Also, the probability argument is criticised as invalid because biological evolution is not a purely random process. Critics have also demonstrated the deficiencies of the eliminative argument based on the intelligent design theory (Dawes 2007).

In this article, I postulate a new theistic argument based on biological evolution, contending that numerous creative products have emerged from the process of biological evolution. Thus, the evolutionary process manifests creativity to a great extent. Extant studies have demonstrated that intelligence is an essential component for generating creativity. Therefore, it can be deduced that biological evolution is probably directed by an intelligent mind (i.e., God). I also discuss some possible theological implications and possible critiques of my new argument.

2. Formulation of the Argument

First, I present my contention in the following logical form:

1. Premise 1: The traits in living organisms have formed through biological evolution.
2. Premise 2: The traits in living organisms manifest some creative features.
3. Conclusion 1: Biological evolution can generate creative products.
4. Premise 3: Intelligence is essential for generating creativity.
5. Conclusion 2: Biological evolution manifests an embedded intelligence.

The sections that follow will discuss the details of the aforementioned premises and conclusions and present relevant supporting evidence.

Almost all biologists agree with Premise 1. Fossil records and genetic variations observed in organisms tangibly evidence biological evolution. Specifically, we can see how the traits in organisms evolved. For example, one can trace fossil records to identify how fins become limbs and how limbs become legs in animals (Shubin et al. 1997; Ruta and Wills 2016). There are countless examples showing how the traits in different organisms evolved during biological evolution (see Asher 2012, pp. 42–62). Using the traditional strategy called comparative anatomy, one can derive evolutionary trees to relate different species together in evolutionary history. The major 'law' involved in driving biological evolution is natural selection. Although the 'law' is not quantitative in nature, recent studies have evidenced that environment could have somewhat constrained the evolutionary process. For example, some organisms have undergone convergent evolution, demonstrating a certain degree of regularity in biological evolution. Some similar features could have evolved in different evolutionary sequences confronting similar environmental pressures. Conway Morris compiled numerous convergent evolution patterns, such as the aerodynamics of hovering moths and hummingbirds, and the evolution of the eye in different organisms (Morris 2003, pp. 457–61). These exemplars reveal the existence of stable regions in biological space. Biological evolution encompasses certain law-like events, regardless of whether one adopts the Humean perspective of laws or follows the notion of dispositionalism (Koperski 2020, pp. 90–92). These natural laws followed in biological evolution offer certain directions and deliver a certain degree of predictive power for biological evolution.

Premise 2 denotes the core premise in this argument. It has been noted that organisms become generally larger, more complex, more taxonomically diverse, and more energetically intensive (i.e., larger energy consumption) during the process of biological evolution (Bonner 1988). Although Gould (1996) has pointed out that some organisms have evolved towards simplicity, the overall complexity shown in organisms has increased compared with that in the early epochs. In broad terms, the diversity and complexities of discrete biological species demonstrate that they may contain some 'creative features' which are analogical to the creative products designed by humans. For instance, organisms have

developed different features based on specific attributes such as movement, sensation, or even body design. These characteristics have evolved to achieve functional purposes such as hunting for food or reproduction. Large animals are not the only creatures that manifest functional behaviours; small plants can generate energy to grow via photosynthesis, and bacteria can reproduce by binary fission processes. Moreover, some of the functions developed can also benefit other living organisms. For example, oxygen is produced via photosynthesis for respiration in animals (generating energy), and some bacteria can provide useful ammonia for plants through nitrogen fixation. Therefore, the evolved traits in most living organisms can perform functions to achieve specific purposes (e.g., hunting, reproduction, and sensation), and even benefit other living organisms and the environment.

Creativity, by definition, can be understood simply as the production of 'something original and worthwhile' (Sternberg and Sternberg 2011, pp. 479–83). Creativity is also usually identified with what is 'new and valuable' or 'original and useful' (Pope 2005, p. 27). In other words, creativity is a measure of originality and usefulness. Therefore, under this simple understanding, most biological species are creative products in general terms because they contain original and functional traits. Nevertheless, to prove the above statement, we need to discuss the concept of creativity more comprehensively and provide a rigorous definition for the meaning of a creative trait in living organisms.

In fact, the term creativity originates from the word creation and applies particularly to creation as envisaged in the Christian tradition (Pope 2005, pp. 37–38). The meaning of creation subsequently changed from 'creation from nothing' to 'natural re-creation from something' once the theory of evolution was formulated (Pope 2005, p. 41). The relationships between biological adaptation and creativity have been much discussed in the literature since that time (Sternberg 1999, pp. 24–25), including a comprehensive discussion by philosopher Henri Bergson (Bergson 1964). For example, the great psychologist Freud, who read Darwin, incorporated the idea of adaptation in survival in his psychodynamic theory of defences and creativity (Freud 1958). Nevertheless, modern psychology and creativity studies have changed the direction of focus in discussing the concept of creativity. Nowadays, the concepts and meanings of creativity in modern psychology and creativity studies are mainly derived from human experience in relation to innovative design and education psychology in the context of technological societies (Kaufman 2016). Since then, fewer discussions have been found in the literature relating modern concepts of creativity to biological evolution or creation in Christian tradition.

In modern psychology, it is a myth that the concept of creativity is subjective and that there is no objective way to evaluate the degree of creativity shown in a product (Treffinger 2009). Although the process of creation might be mind-dependent, the creative features manifested in a product or an artefact can be objectively evaluated and assessed (Treffinger 2009; Kanli 2020). Recent studies have suggested various evaluation criteria that can objectively assess the degree of creativity manifested in a product (Kaufman et al. 2008; Antonietti and Colombo 2012; Kanli 2020). One method of assessment is product-based assessment (a consensual assessment technique), which is independent of the creation process involved (Kaufman et al. 2008, p. 240). In the following, we will further discuss some modern concepts of creativity and the general evaluation criteria that can qualitatively assess the existence of creative features shown in different organisms. These concepts of creativity are derived from human experience (including educational psychology), and they are agreed upon by general consensus among scholars in creativity studies.

MacKinnon (1978) established three fundamental criteria for assessing a creative product (a human artefact):

1. The creative product must be original and exhibit a sense of novelty.
2. The product must adapt to reality. It must serve to solve a problem, satisfy the needs of a problem situation, or accomplish some recognisable goal.
3. The product cannot remain an idea; it must be materially generated as a real product.

Some scholars have posited three additional concepts for the evaluation of the sense of novelty mentioned in the first criterion (Fox and Fox 2000, p. 171):

a. Is it original?
b. Is it transformational?
c. Is it germinal?

These questions indicate that a creative product must be original, must be able to generate new ideas, must change daily life, and competitors should want to copy it (Fox and Fox 2000, p. 171). To summarize the above criteria, a creative product must contain some new usable function that can overcome a problem to adapt to reality (achieve a specific goal). Following this analogy, a creative trait in an evolved organism should also manifest some unique usable function that can solve a problem stemming from environmental changes. Therefore, based on the concepts of creativity in modern creativity studies and summarizing the criteria above, we can define a creative trait in an organism.

The definition of a creative trait in an organism is as follows:

> A creative trait is a unique trait that involves a usable function to solve a problem that can help the organism to adapt to its environment.

Generally speaking, the species that have evolved through biological evolution contain a lot of unique creative traits. They have functional parts or organs for hunting for food and reproduction. Plants can have many unique functional parts to intake carbon dioxide and water for food production. Environmental changes always give challenges and problems to different species. Nevertheless, although some of species are eliminated by these challenges, other species can evolve suitable functional traits to adapt to environmental changes (e.g., climate change, geological change, etc.), such as the development of feathers, wings, and legs. Some of these traits can be transformational to overcome the challenges that arise from environmental changes (e.g., fins are transformed to legs). The tentative "apparent goal" involved is to survive, reproduce, and adapt to the environment. Here, our discussion focus is on 'creative products' (creative traits in organisms), but not the 'creative process' (the evolutionary process).

As a more specific example of a creative trait, it is notable that eyes have evolved through several stages in organisms from photosensitive cells. Complex eyes have evolved independently through discrete evolutionary paths several times. Organisms have attained a competitive advantage by developing complex and image-forming eyes for food hunting. The evolution of the eye has changed the natural world, turning it into a highly competitive environment. Interestingly, some creatures evolved the ability of crypsis when other animals developed eyes. Crypsis allows these creatures to conceal themselves from predators. The functions and features of the traits discussed above easily satisfy all the criteria stipulated for a creative product that has evolved in nature. Similarly, the ear, nose, skin, and brain also demonstrate the creative features defined above. Moreover, many biological species possess more functions and perform more tasks as they become increasingly complex. Therefore, evolution represents an upcycling process. The recently coined term 'upcycling' is used mostly in environmental management. Upcycling signifies creative reuse and designates the process of transforming old materials into new and better-quality products. Biological evolution can definitely be characterised as upcycling because new species evolve from old species (their ancestors), and many of them are generally more complicated than their predecessors. New species can perform more functions and become more intelligent. The upcycling shown in biological evolution is a fact that we can easily observe, though mutations and natural selection do not necessarily entail the manifestation of upcycling.

My analogical argument is based on the overall similarities between creative traits shown in organisms and the creative products designed by humans. The base of the analogy is that both human artefacts and traits in organisms originate from lower-level (or generally less complex) raw materials after a process (creation by humans vs. biological evolution). The traits discussed above, such as complex eyes and crypsis, are typical examples of the analogical argument. However, there is one difference between creating a new product and evolving a new species through biological evolution. In human creativity, we have

the intention to create new products for applications (solving problems of daily life). In biological evolution, there is no obvious analogous 'force' or 'intention' that apparently pushes organisms to develop new functional traits for adaptation. Biological evolution is a bottom-up process that does not have any larger plan beyond evolution. Nevertheless, this issue is related to the process of generating creativity rather than the creative features shown in organisms. As I am not focussing on the process, this issue is not relevant to my analogical argument.

One might still argue that whether a product is creative or not is purely subjective. Similarly, determining the creativity shown in the traits found in organisms is also subjective. First, as mentioned above, the belief that creativity is difficult to measure is a dominant myth (Treffinger 2009; Kanli 2020). There are already various methods to assess creativity objectively (Kaufman et al. 2008; Treffinger 2009; Antonietti and Colombo 2012; Kanli 2020). Creativity is definitely measurable. Second, we need not quantitatively measure the actual degree of creativity of the traits in organisms. This might be hard in authentic situations. What we need is to determine whether a trait shown is creative or not creative. One way for determining this is to evaluate the functions demonstrated in the traits. If the unique trait in a species has a usable and actualized function to solve a problem for adaptation, it is regarded as a creative trait.

In fact, there is an important domain of technological research called 'biomimicry', which can serve as a strong example demonstrating that many traits of life are creative products. Biomimicry is the practice of learning from and mirroring strategies found in nature to resolve human design challenges.[1] For example, the streamlined design of high-speed trains in Japan was modelled on the beak of the Kingfisher bird.[2] The biological world is explored for inspiration simply because many biological species are creative products. Their movements, appearances, and structures are replete with creativity. Therefore, biomimicry indicates the transformational 'design' of many biological species and proves fruitful in inspiring innovative ideas. This example supports the great similarity between human creative products and the creative traits manifested in many organisms. Therefore, the analogical argument for Premise 2 is convincing.

In addition, although the criteria discussed above are not dependent on the creation process involved, how biological laws generate creativity can also be analogically understood by the human creative thinking process. A human creative thinking process can be reduced in psychological terms to a series of divergent and convergent thinking processes (Kaufman 2016, pp. 20–27). Divergent thinking entails the creative generation of multiple possibilities vis à vis an open-ended problem; convergent thinking aims to attain the best solution to a problem (Runco 2023, pp. 1–36). Genetic mutations and drifts in biological evolution are analogous to divergent thinking processes because they enlarge the parameter space to develop additional possible competitive features for survival. Competition in nature represents the convergent thinking process, eliminating weaker species and determining the best solutions to the survival-related problems confronting species. Therefore, the overall biological evolution mechanism is analogical to the creative thinking process embedded in nature, which further supports the analogical argument for Premise 2.

Based on the concepts of creativity developed by philosophy and psychology and following our analogical arguments, we can conclude that many biological species contain creative traits. Therefore, Premise 2 is true. In fact, organisms do not necessarily contain creative features. There are various substances and objects that have evolved naturally, such as stars, galaxies, planets, volcanos, clouds, waterfalls, and mountains.[3] They do not manifest any significant creative features based on the above criteria. Although they may demonstrate some 'functions' like generating energy or heat, these so-called 'functions' do not have any specific purpose for problem solving or adaptation. Among the different 'products' evolved in nature, only organisms contain features demonstrating transformational, germinal, and functional properties to solve problems and adapt to nature. Some of the features developed in organisms (e.g., flying in birds) can even go beyond human experience. Also, the creative traits in organisms are somewhat transformational. Many

traits have been transformed to align with environmental changes (e.g., changing from fins to legs). However, stars and galaxies do not have the transformational power for adaptation. Therefore, there is a need to explain why a great similarity exists between the creative features manifested in organisms and human artefacts. Here, the evidence and similarities demonstrated are strong enough to consider a possible personal explanation (Swinburne 1968). This is not due to humans imitating nature, but a need to satisfactorily account for the observed evidence. Thus, Premise 2 is not question-begging here. We will further discuss the related Humean objections later. To refute Premise 2, one has to argue that the assessment criteria used are not exhaustive, and show that organisms are just 'creative-like' products (i.e., pseudo-creative), but not truly creative products. The burden of proof is on the critics' side.

Conclusion 1 must be accurate if Premises 1 and 2 are true: the process of biological evolution can generate creative traits in many different species. Most scientists would agree with this conclusion. I now turn to Premise 3 for the focal proposition of my argument.

Scholars have explored the relationship between creativity and intelligence for a long time. Some early studies concluded that intelligence is a necessary condition for creativity. Different theories have been postulated to investigate the actual relationship between creativity and intelligence. As noted by Kaufman (2016, p. 137), 'creativity and intelligence, like bacon and eggs, certainly seem like they should go together'. In this context, I would like to argue that the component of intelligence is essential in demonstrating creativity, notwithstanding the assertion of some dated studies that creativity and intelligence are not positively associated (Getzels and Jackson 1962).

In fact, the term 'intelligence' is broadly and multifariously defined (Legg and Hutter 2007). For example, Anderson described intelligence as 'the facet of mind underlying our capacity to think, to solve novel problems, to reason and to have knowledge of the world' (Anderson 2006). Bingham (1937) explained intelligence as 'the ability of an organism to solve new problems'. The *World Book Encyclopaedia* identified intelligence as 'the ability to adapt to the environment' (Anderson 2006). Therefore, numerous scholars and sources have tended to define intelligence as the ability to solve problems and adapt to new environments. Legg and Hutter compiled varied definitions of intelligence into one statement: 'Intelligence measures an agent's ability to achieve goals in a wider range of environments' (Legg and Hutter 2007, p. 22). Interestingly, the above statement of intelligence is closely related to the term creativity, which denotes the ability to achieve the goal of solving problems and produce novel products. Therefore, the broad definitions of intelligence and creativity display some relations. Here, the aim of discussing the definition of intelligence is to highlight the possible ontological relation between the concepts of intelligence and creativity. In the following, I will discuss the actual empirical connection between intelligence and creativity found in modern psychology and cognitive science.

Many recent works have pointed out that the concept of creativity is a subset of the concept of intelligence, such as Stemberg's theory of successful intelligence (Sternberg and O'Hara 1999, pp. 251–72). Although it is too strong to conclude that creativity is a subset of intelligence (not all psychologists agree with this statement), based on the above discussions, we can argue that intelligence is a necessary factor for generating creativity. If we consider intelligence as a measure of ability to solve problems, it is a necessary factor for generating creativity, because creativity involves problem solving. Therefore, generating creativity requires intelligence. Although some psychological studies show that no positive statistical correlation exists between creativity and intelligence, these studies do not assert the absence of a connection between the two constructs. Note that the definitions of and statements related to intelligence and creativity mentioned above are not arbitrary, but based on long-term investigations in psychology, cognitive science, and creativity studies.

If intelligence is essential to creativity and biological species contain some creative traits, we can analogically deduce that some type of intelligence is embedded in the process of biological evolution to generate creative traits. Therefore, Conclusion 2 is likely to be true. In other words, the intelligence embedded in the natural laws driving biological

evolution directs biological species to become more complex and increasingly functional so that they can survive within their environments and even modify their surroundings. The manifested creativity of the traits observed in organisms supports the stated conclusions.

3. Theological Implications

What does biological evolution that manifests some type of embedded intelligence imply? A direct deduced proposal is that an intelligent mind (i.e., a God or transcendent being) exists and oversees biological evolution. Although we cannot draw any specific conclusions on related theological models, I will discuss two possible models of theology as follows:

i. An embedded intelligent mind exists in the natural world and directs biological evolution.
ii. An external intelligent mind exists and manipulates the laws of evolution.

The first possibility approximates the model of panentheism, which is a theological proposal suggesting that our world exists within a divine being (Griffin 2014, p. 1). This model asserts a metaphysical connection between the natural world and God. The laws governing biological evolution are part of God; hence, the process of evolution demonstrates creativity and intelligence.

The second possibility represents the classical model of theistic evolution (Van Till 1999, pp. 159–218). In classical theism, God is omnipotent, omniscient, and perfectly good (Swinburne 2010, pp. 7–13). God is simple, and this simplicity is the best way to account for many observations, such as the fine-tuning of the universe (Swinburne 1998). In this context, God may intervene in the natural world to guide biological evolution to fulfil a certain purpose. God's intercession demonstrates creativity and intelligence. Notably, God's involvement does not imply that He violates natural laws. He can direct the process of evolution without disturbing existing physical laws (Koperski 2020, pp. 134–36). Conceivably, God could also fine-tune all initial conditions in His initial creation, and great creative potential is thus stored in the natural world. Consequently, the process of biological evolution releases the stored potential to generate creative products without the need for any direct interposition from God.

Note that it is not possible to draw conclusions on any specific models in theology based on Conclusion 2. The above discussions are simple, and are the direct implications of two popular theistic models—classical theism and panentheism—based on my argument. Further in-depth investigations on different theistic models are definitely required to enrich the discussion.

4. Possible Critiques

It might be argued that accepting Conclusion 1 does not automatically lead to Conclusion 2 being validated. The focal question of this paper is as follows: Can a random or law-like process without intelligence generate creativity? My answer to this question is no.

First, it is logically possible that the natural laws governing biological evolution emanated from an innately programmed algorithm. However, a simple algorithm cannot generate creative products. Only algorithms that can learn, make decisions, and solve problems contain some sort of intelligence (now known as digital artificial intelligence (AI)). AI can generate creative products and manifest creativity (e.g., write a poem or compose a song). Therefore, intelligence is a necessary ingredient in demonstrating creativity. A purely random or simple law-like process without intelligence cannot generate creativity. Nevertheless, note that AI design is a mindful process. AI algorithms and machine learning processes are designed by human minds. Therefore, a mind-like agent is probably required to design or manipulate evolutionary processes if the example of an AI algorithm can be deemed analogous to the natural laws governing biological evolution. However, it is still logically possible that the laws of biological evolution contain an AI-like algorithm without any mind. This would be close to the proposal of pantheism.

Second, the second law of thermodynamics stipulates that entropy must increase in a closed system. A system tends to become more random and consequently less functional.

A random configuration tends to undermine creativity, a quality that is intricately connected to features such as functionality, novelty, and originality. Therefore, it is difficult to demonstrate creativity in non-living objects that manifest in random configurations. Also, it is not true that natural selection, with enough time, must be able to generate the creative traits manifested in living organisms. Natural selection is just a process of elimination. It does not have any driving force causing a species to change its genes properly to generate new functions for adaptation. Therefore, a personal explanation is required to account for the creative features that have evolved. Furthermore, some studies have shown that self-organisation processes tend to generate higher complexity; however, such self-organisation processes usually mandate interpersonal communication or active interactions (Ziepke et al. 2022). No exemplars of creativity can be demonstrated in non-living things that have evolved solely on the basis of physical laws or natural processes. Stars and galaxies are governed by physical laws; they are quite complicated and awe-inspiring, but their characteristics do not satisfy the aforementioned criteria for creativity. We have not discovered any arrangement of rocks demonstrating the functions of creativity, such as solving problems or achieving certain goals. For instance, Stonehenge is a particular arrangement of rocks found in England that perhaps served certain functional purposes, but is believed to have been designed by a human civilisation.

For living things, biochemical reactions can transform material structures and generate energy. Genetic mutations or drift occurring during reproduction can help new biological species develop. The characteristics of biological species are determined by their genetic codes. Combining these effects with the natural laws embedded in biological evolution, the overall information stored in nature can be increased to make life more complex and increasingly functional. Moreover, the apparent goals of all biological species are survival and reproduction. These natural processes and the embedded purpose of life 'nurtured' creativity in living beings during the macro-evolutionary process.

Another possible critique may be related to the anthropocentric nature of the current discussion. These kinds of criticisms are closely related to Humean objections to the design argument (Swinburne 1968). The concepts of creativity and intelligence originated in psychological studies conducted by human beings; however, similarities grounded in human experience are inevitable in discourses on design, or teleological arguments. The above discussion has established similarities between the human mind and the intelligence embedded in biological evolution. This is based on the analogical relation between human creative artefacts and creative traits in organisms. On the other hand, based on our observations, we know that some biological species have evolved, while some have been eliminated. This survival-of-the-fittest process has indirectly enhanced overall competitiveness. Therefore, the process of evolution has somewhat resulted in a goal-like direction. Increasingly complicated life forms have evolved on the basis of a series of trials, errors, and eliminations to finalize which species can solve more problems and are more capable of survival. This goal-like driven progression approximates the process of an engineering designer solving invention-related problems and creating novel products. In other words, a large similarity exists between biological evolution and the engineering design process carried out by the human mind. This has set up an analogical relation between the human creative process and speciation in the evolutionary process. Overall, my whole argument here is analogical in structure, which can overcome the problems and objections stated by Hume (Swinburne 1968; Jantzen 2014, pp. 124–26).

In view of the above discussions, there is a need to explain why these similarities exist and explore what causes these similarities. One may argue that the apparent goals of evolution (e.g., survival and reproduction) are not real goals according to non-teleological science. In fact, modern science is methodologically naturalistic, and there should be no teleology involved in scientific explanation. However, apart from scientific explanation, personal explanation is another possible way to provide reasonable explanation. Personal explanation of the laws of nature refers to the explanation of some phenomenon in terms of the operation of an agent. Hence, the principles used to explain phenomena would be

reduced from two to one (Swinburne 1968). As Swinburne (1968) mentions that 'the issue turns on whether the evidence constitutes enough of a necessitas to compel us to multiply entities', we need to judge whether the similarities between biological evolution and human creation are strong enough to affirm our conclusion being true. Here, I argue that the evidence and similarities shown are strong enough to invoke personal explanation and affirm the conclusion. Consider the following example for illustration (a revived version of Paley's argument). An astronaut has found an object on the moon which contains button-like components and a screen-like display. Although it is not identical to a human machine or a computer, it is very similar to a machine made by humans. This large similarity can support the use of personal explanation to account for the object's origin. However, if we follow the approach of scientific explanation, we can only conclude that the object is machine-like and wait for further scientific investigation on its origin.

Lastly, one might criticise that my argument presented here is similar to the classical design argument. Based on the analogy of watch design, the classical design argument argues that the complexity and functions shown in organisms demonstrate some features of body plans, which are closely related to intelligent design (Jantzen 2014, pp. 118–35). My argument and the classical design argument share almost the same structure. However, there are two major differences between my argument and the classical design argument. First, although the classical design argument does not state that there must be an ultimate goal or purpose for all complexities and functions in nature, a goal or purpose is implicitly accompanied by functions and complexities. If there is no purpose or goal for the complexities or functions, it is hard to argue why they are designed in that way. Therefore, different versions of design arguments are commonly categorized under the teleological paradigm in the philosophy of religion (Jantzen 2014, p. 1). As Paley (2008, p. 251) states that '. . . when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose, e.g., that they are so formed and adjusted as to produce motion . . .', one can see that a purpose or goal is implicitly involved in the classical design argument proposed by Paley. Nevertheless, in the classical design argument, the design process is a top-down process. A top-down design process refers to a process in which there is a big ultimate goal prior to the design process. However, the theory of evolution shows that a bottom-up mindless evolutionary process can generate the complexity shown in organisms. There is no big ultimate goal identified in evolution, so we do not need to invoke intelligent design. In my argument, the evolutionary process is a bottom-up process that only involves small tentative goals like survival and adaptation. By achieving these small goals during the process of evolution, some larger complexity could be generated. There is no big goal involved. Evolved complexity or the so-called body plan is not the ultimate goal. Second, although the structures of the analogical arguments are similar, there are some differences concerning the evidence evaluated in the classical design argument and my argument presented here. First, the concepts related to the design-like features shown in organisms are not well defined in the intelligent design argument. Although human design can generate complexity and functions, the complexity and functions shown in organisms are not sufficient factors to argue for intelligent design. Most biologists do not accept that the complexity shown in organisms is irreducible. Also, the concepts of irreducible complexity and specified complexity are criticised by many philosophers (Jantzen 2014, pp. 189–225). Therefore, there is no need to invoke personal explanation to support the design argument. However, the concept of creativity has been thoroughly discussed in philosophy and psychology, so some objective criteria exist that can clearly evaluate the degree of creativity qualitatively. Creativity is definitely measurable, and it is not merely a subjective concept. As mentioned above, there are various studies discussing the methods for evaluating and measuring creativity (Kaufman et al. 2008; Treffinger 2009; Antonietti and Colombo 2012; Kanli 2020). The functions of traits demonstrated to have adapted to the environment in different biological species are the most important indicator to show that they are creative products similar to human artefacts. If one accepts that the traits in organisms are analogical to human creative products, then

we need to judge whether the evidence is strong enough to invoke personal explanation to account for the creativity shown. In short, the major difference is that we cannot easily evaluate the 'degree of design' shown in a product based on complexity alone, but we can easily evaluate the degree of creativity shown. This is because creative features are identifiable, while design is a top-down thinking process, which is difficult to measure and identify unless the big ultimate goals involved are known. So-called design features like irreducible complexity are not widely accepted by scientists, and the related concepts have faced philosophical challenges. Here, I suggest that the creative features manifested in organisms might be a new form of objective measurable evidence to support the design argument or teleological argument.

On the other hand, note that my argument does not argue that the existence of intelligence embedded in nature logically entails the existence of God. Nevertheless, the existence of God is a very good explanation to account for the intelligence embedded in nature. The theological implications discussed above are only two possible theistic models consistent with Conclusion 2. In fact, there are some other proposals that could possibly account for Conclusion 2, such as the theory of cosmopsychism proposed by Goff (2023). To refute my argument, one could suggest a possible way to generate creative features in an object without any intelligence involved, just like proposing the theory of biological evolution to account for the design-like complexity and functions in organisms to refute the classical design argument.

5. Conclusions

In this article, I have discussed a new type of theistic argument related to biological evolution. I have evidenced, based on the creativity manifested in biological evolution, that intelligence is embedded in the laws governing the evolutionary process. My reasoning indicates that nature could be panentheistic, or that an external personal God could manipulate natural laws to direct the process of evolution. The creativity argument offers a new direction for theistic arguments and reinforces the idea of theistic evolution.

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Notes

1 https://biomimicry.org/what-is-biomimicry/ (accessed on 30 October 2023).

2 See https://www.bbc.com/news/av/science-environment-47673287 (accessed on 30 October 2023).

3 Note that the physical process of generating atoms, stars, or galaxies could be a creative process. However, it is difficult to identify the creative elements in a process. In other words, it is hard to evaluate the creativity of a process, but it is easy to measure the creativity manifested from a concrete product (e.g., the functions demonstrated). Here, we focus on the creativity of a product only, rather than the process involved.

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