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Reformed theology and natural science – Conflict or concurrence?

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Atheistic natural scientists propagate a normative materialistic view of the universe, where God as creator is superfluous. Much effort is being expended to bring into disrepute any notion of extraneous control over the laws of nature. The idea of the universe and everything in it as an ongoing 'cosmic accident' is presented as the only truth. This is in stark contrast to recent scientific discoveries in disciplines such as biochemistry and palaeontology. In this article, the most recent developments in the fields of intelligent design and the anthropic principle will be interrogated to demonstrate that the reformed faith in God as Creator is credible and that the notion of creation as God's general revelation to humankind is increasingly being accepted by the natural scientific community.

Keywords: Intelligent design; Neo-Darwinism; Normative methodological naturalism; Random unguided materialism; Reformed theology; Teleology.

Introduction

To explore the question whether reformed theology and contemporary natural science are in conflict, it is necessary to start with the second law of thermodynamics, which states that everything in the universe tends towards increasing disorder. Generally speaking, any substance will decompose into its constituent parts; thus, entropy (or chaos) in all cases increases over time, and everything tends to deteriorate to a state of lowest energy (McKelvey 2004:66).

The implication is that for anything to exist at all, such as a star, a planet or living organisms, there must be some external driving force that creates order from the primordial disorderly state. The question that has occupied humankind since ancient times is what the nature of this creative driving force is. It was to be expected that humankind turned to the supernatural to seek clarity, and the Greeks distinguished a so-called 'Prime Mover' that they believed was responsible for the creation of everything (Bodnar 2018). This era was followed by the Roman Empire, which was characterised by a polytheistic God notion, and later the Judeo-Christian traditions, which accepted God as creator as described in the Holy Scripture.

With the fall of the Roman Empire, literacy and culture became centred mainly in monasteries (Graff 1987:10). As a result, literacy declined amongst the general public and became increasingly centred in clergy. The formulation of scientific theories to explain observations during that time was thus in most cases derived from Scripture. Examples are a flat earth fixed on pillars, a geocentric view of the universe and the Genesis creation narrative.

With the development of the first universities, ancient writings preserved in the Muslim 'House of Wisdom' in Baghdad reappeared in the Western academic world (Murray 2009:24). These 'pagan' documents, from a Christian perspective, were the first source of tension between science and the then church. In 1215, Aristotle's view of religion led the pope to prohibit the reading of any of his books on natural philosophy, or any commentary thereof, in public or in secret (Cullen 2006:41).

At the same time, Roger Bacon began to proclaim the idea of empirical work (or experimentation) as the only authoritative source of knowledge (Adamson 1911). This was followed by three well-known events that led to major changes in all spheres of society, namely, the Renaissance, the Reformation and the Scientific Revolution.

Eminent scientists of that time were mostly believers, but their empirical work brought increasing tension between the scientific community and the church because the prevailing theories of the time could not explain observed data. Francis Bacon, in particular, increased this tension with his

Note: Special Collection: Impact of Reformed Theology.

open adherence to empiricism and rationalism (Sargent 1999:xii). Shortly thereafter, the era of the Enlightenment followed, with its overt opposition to the church and a glorification of human reason. The prevailing spirit of that time was well illustrated by Laplace, who replied to a question from Napoleon with the statement that he saw 'no need for a God hypothesis' (Alcalde 2019:3). Other authors of the time include Hegel, Marx and Weber, and materialistic reductionism in natural science was in full swing.

During this period of absolute confidence in human reason, Darwin published his theory of evolution under the title 'On the Origin of Species by Means of Natural Selection' (Darwin 1859). The central thought of his theory was that present species descended by evolution from common ancestors through the process of natural selection. The idea of evolution was not an original thought of Darwin's, although no scientist before him had proposed a mechanism (natural selection) for the phenomenon of evolution (Ellis 2016:3). Darwin's theory was an ingenious interpretation of scientific observations that were enthusiastically accepted by the scientific community, as it provided an alternative impetus for creating order out of disorder. The concept of natural selection was most acceptable to scientists of the time, and prominent scholars like the anthropologist Thomas Huxley (1825–1895) became ardent advocates of Darwin (Subramanian 2005:85). This evolutionary driving force could explain most scientific observations of the time without the need for a supernatural, metaphysical element. A divine Creator became unnecessary.

As Darwinian evolution stands on two pillars, namely, a common ancestor and natural selection, it was inevitable for a severe theological debate to erupt, as the implication of the theory was that humans, who are the crown of God's creation according to Scripture, could be from animal origin. The opposition of theologians could, however, not last against the convincingness of the scientists, and the theory of evolution of Darwin was soon generally accepted as the most basic theory in biology (Ellis 2016:68).

In the 1920s, however, in an upsurge of fundamentalist religious fervour in the United States, anti-evolutionary sentiment stopped public schools from teaching evolution through state laws such as Tennessee's 1925 *Butler Act* and by getting evolution removed from biology textbooks (Scopes 1999:318). In 1961, a book entitled 'The Genesis Flood' was published and subsequently the term 'Creationism' was proposed (Whitcomb & Morris 1961). In 1968, Michael Polanyi proposed the theory of irreducible complexity, which strengthened theories with a creationist basis (Polanyi 1968).

In 1968, however, Epperson v. Arkansas ruled against state laws prohibiting the teaching of evolution, concluding that such laws violate the Establishment Clause of the First Amendment to the United States Constitution which prohibits state aid to religion. This was followed by several court cases in the 1970s, which ruled that it is unconstitutional to give equal treatment to creation as per Genesis in public schools (Moore 2010:18). This view has widely been accepted in the scientific community, and any reference to creation as alternative to naturalistic evolution is considered to be 'pseudo-science' (Ellis 2016:34).

The history of natural science contains evidence of the battle between people who separate science and religion and people who believe that they are intertwined and cannot be separated. Prominent figures representing different views can be identified, for example, Thomas Aquinas who was convinced that the two revelations of God (Scripture and nature) confirm and support each other (Doyle 2007:343). Contrary to this, William of Ockham was a fideist, maintaining that belief in God is a matter of faith rather than knowledge. He deducted that theology was not a science and rejected all alleged proofs of God's existence (Spade 1999:334). Another prominent scholar, Gould (1997), propagated that:

> Science tries to document the factual character of the natural world, and to develop theories that coordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meanings, and values – subjects that the factual domain of science might illuminate, but can never resolve. These two magisteria do not overlap, nor do they encompass all inquiry. (p. 17)

The question addressed in this article is which of these views can be accepted as being the best explanation for contemporary scientific observations. To explore this question, the theory of intelligent design will be explored.

Intelligent design and implications for worldview

The theory of intelligent design (ID) 'holds that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection' (Discovery Institute n.d.:n.p.).

Unfortunately, ID has (ignorantly) been associated, by some, with religious-fundamentalist theories of origin and is therefore currently often described as a pseudo-science, for example (Wikipedia n.d.):

> Intelligent design is a pseudoscientific argument for the existence of God, presented by its proponents as an evidence-based scientific theory about life's origins. Proponents claim that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection. Intelligent Design is a form of creationism that lacks empirical support and offers no testable or tenable hypotheses, so it is not science. (n.p.)

Intelligent design is a theory inferred from robust contemporary scientific observations and not from Scripture and therefore does not agree with, for example, Young Earth Creationism (Berlinski, Gelernter & Meyer 2019). Young Earth Creationists deduct from Scripture that the age of the earth is 6000–7000 years and that the duration of the act of creation was 6 days of 24 h each. Contrary to this belief, ID agrees with all mainline scientific theories such as radiometric dating,

certain aspects of the process of natural selection and physical constants.

The accusation has been levelled by materialistic reductionists that the theory of ID is merely another 'God of the gaps' argument, with the ulterior motive of reintroducing an argument for the existence of God into school curricula (in the United States). This accusation can be refuted by the fact that it is known that the foundation of life is a four-character digital code stored in DNA, discovered by Watson and Crick in 1953. To build any new life forms, new genetic information is needed. Without a single exception, information always arises from an intelligent source, whether it is information contained in radio waves, text, digital code or hieroglyphics. The existence of information is evidence for a 'mind' and contrary to an undirected, random materialistic process. What is seen in the natural scientific world is not only an 'apparent' design as proposed by many contemporary materialistic evolutionists but also a design originating from a self-aware mind. Thus, ID is not a theory which merely fills in the gaps of current understanding of natural science, but a credible theory about the origin and development of life, inferred from scientific data and drawing on scientific knowledge of cause and effect (Berlinski et al. 2019).

According to Popper (1962:42), the distinction between science and pseudo-science can be found in his philosophy of scientific falsification. If this prerequisite is applied to ID, evidence should be sought which can prove ID as false. Such evidence will have to prove that an undirected process that can produce information beyond a mathematically defined threshold exists. No such credible evidence has been proposed (Berlinski et al. 2019).

Another way of defining the formation of theories in natural sciences is 'inference to the best explanation' (Berlinski et al. 2019). The best explanation for information as observed in nature is the cause that is known to produce the effect in question. A certain amount of information might arise by chance, but only a 'mind' can produce the amount of information observed needed for the 'big jumps' observed in the history of life. Contrary to this, new atheists (neo Darwinian thinkers) view reality as a self-creating entity guided by an undirected, uncontrolled process without any guidance whatsoever, producing the appearance of design. This atheistic materialistic worldview 'makes it possible to be an intellectually fulfilled atheist' (Dawkins 2006:10).

Intelligent design proponents are rightly accused of not fully accepting evolution, which in neo-Darwinians' opinion is an undisputed fact. Evolution has various components, for example, change over time, which results in small-scale variation or variety of species. With this aspect, ID is in full agreement. However, regarding common ancestry, there is disagreement because there is ample evidence of discontinuities in the fossil record and in genomics where certain genes are unique to certain taxa with no similarities in the genomic database (Meyer 2013:336).

The biggest discontinuity, however, is the origin of life itself. There is an extraordinary complexity gap between mere chemical reactions and processes that are observed in living organisms, such as complex molecular machines and DNA containing digital code within a complex information storage and retrieval system. A series of discontinuities are also found within the fossil record with the Cambrian explosion being the most prominent, with organisms with completely new body plans arising without any discernible connection to any previous organisms within a very narrow window of geologic time. The Cambrian explosion is only one of several such discontinuities in the fossil record (Mángano & Buatois 2017). It is clear from scientific data that most living forms on earth arose discontinuously, which leads to the question of the origin of new information needed in DNA to build new organisms.

Evolutionists' claim that new mutations and natural selection can produce all forms of life as well as the appearance of design that living forms manifest by a random, unguided process is challenged by ID. To substantiate this challenge, it has been demonstrated that the information necessary to result in the vast number and variety of novel life forms could not have come about by chance. In 1958, Crick (who was a code breaker in the Second World War) proposed his sequence hypothesis indicating that base pairs on the inside of the DNA helix function as alphabetical characters in a language, similar to a binary computer code. It was demonstrated that it is not the physical or chemical properties of the base pairs that are important, but their sequential arrangement, because this sequence expresses the information necessary for building specific proteins and micro-machines needed by living organisms. It can be likened to the engineering technique of CAD-CAM, where if one wants to construct a new artefact, coded instructions are written for the machine to make it.

The crucial question in biology remains the origin of the information necessary for new life forms. As the information contained in DNA must be meaningful and functional, ID proposes that it cannot be the product of a random arrangement, but that only a 'mind' is capable of producing such information. Evolutionists claim that random mutations, given enough time, are able to produce such a strand of DNA. This claim, however, gives rise to a profound mathematical problem. If a series of new characters are randomly inserted in a computer programme, it is vastly more likely to degrade the original information than producing an improved, meaningful, functional computer program (Meyer 2009:204). The odds of a mechanism of random mutation producing a new functional gene capable of making a new protein of only 150 amino acids long have been calculated, coming to 1 in 10^{77}, which are prohibitive. It is estimated that there are 10^{65} atoms in our galaxy (the Milky Way), so a random search for a new functional sequence can be compared to finding one specific atom in 1 trillion galaxies (the size of the Milky Way). Four billion years of life's history on Earth are not nearly enough time for an unguided random process to be successful (Meyer 2009:212). As a vast volume of new information is necessary to construct new body plans, new cell types and

new anatomies as observed in the fossil record, it is completely implausible that such information came from an unguided random process. The only known plausible mechanism that can produce such information is an intelligent author (Meyer 2009:218).

Various attempts have been made by evolutionists to propose hypothetical mechanisms to get around the indications for an intelligent author. These include, for example, the theory of punctuated equilibrium (Eldredge & Gould 1972), which proposed that branching speciation called 'cladogenesis' could be restricted to rapid geological events during which a species splits into two distinct species, rather than one species gradually transforming into another. Although this theory was able to explain gaps in the fossil record, it failed to explain either the amount of observed change or the geological time necessary for a random process to achieve it. This theory was therefore dismissed by the early 2000s.

Another materialist theory known as Natural Genetic Engineering as proposed by James Shapiro (1992) attempted to explain the major innovations observed in nature. He later proposed a 'pre-programmed adaptive capacity' (Shapiro 2005) that could be triggered by external factors to produce certain new proteins of which the information was already present in the genes. Many mutations are therefore not random at all, but pre-programmed. The question regarding the origin of this pre-programmed information remains, though.

The ultimate question that materialists fail to answer is how organic life arose from inorganic material in the first instance. The famous Miller-Urey experiment in 1952 where a sparked chamber containing reducing gases produced three amino acids is often cited as providing the answer to this question, but it has been shown that there were three problems with this experiment, namely, (1) early earth had an oxidising atmosphere, (2) amino acids do not make a protein and (3) proteins by themselves do not make life (Meyer 2009:224). The chemical evolution theory therefore failed because one needs information to arrange amino acids (the building blocks of life) into three-dimensional protein molecules inside a living cell.

Another attempt to propose a mechanism whereby a random unguided process could lead to life is called the Ribonucleic acid (RNA) world thesis as proposed by Alexander Rich in 1962 (Atkins, Gesteland & Cech 2006). This theory proposed that some RNA molecules can perform information storage and catalyse certain reactions, which means that life could 'start itself'. The problem with this proposal remains the origin of the initial information, which ironically strengthens the ID argument.

Normative methodological naturalism

Normative methodological naturalism is the assumption that science has to explain everything by undirected, purely materialistic processes (Rosenberg 1990:35). As soon as any scientist allows a notion of a metascientific explanation, it is summarily rejected as pseudo-science. Regarding evolutionism, if someone questions evolution, he or she is portrayed to be either 'stupid, wicked or insane' (Dawkins 1989).

Numerous mainline scientists therefore have for decades attributed the observable universe to a lucky cosmological accident driven by gravity, followed by an unguided, random process of mutations and adaptations of organisms driven by natural selection. Any notion of a superior intellect that designed or controlled nature was *a priori* completely excluded, and scientists who dared suggest the mere existence of an extraneous intelligence at work as a possible alternative to unguided random chance were ridiculed and scorned. In many instances, the careers of such scientists have been severely curtailed, and this is still happening in many parts of the world.

Unfortunately, well-meaning people of faith have contributed to the exclusion of the involvement of any superior intelligence in reality by often operating from a narrow, ideologically driven paradigm and by simply ignoring proven scientific theories that do not agree with their worldview. This gave impetus to materialistic scientists to discredit the existence of an external intelligence in no uncertain terms. The result is that in many countries, it is unlawful to teach anything but unguided, random theories to explain reality.

However, recent technological developments have enabled scientists to observe on a scale that was unthinkable just a few years ago. Humankind now has the ability to study the furthest reaches of the known universe as well as to view incredible molecular machines that are driving complex processes in cells, and even to observe subatomic particles in real time. The results of such observations profoundly challenge unguided randomness as the only explanation of reality, and an increasing number of scientists acknowledge the likelihood of an extraneous intelligence having played (and is still playing) a significant role throughout the history of the universe (Berlinski et al. 2019).

The ID paradigm accepts the validity of all mainstream scientific theories, with the general provision that all scientific theories are by nature preliminary. The data provided by robust science are undisputed by the proponents of ID. As such, techniques and theories such as quantum mechanics, metabolomics, radiometsric dating, paleontological principles and even evolution itself are utilised as research tools for unravelling the mysteries of the universe. Intelligent design therefore differs from materialistic reductionist science by not *a priori* excluding any explanation on the basis of pre-scientific convictions because to do this would be nothing but subjectivity.

Many recent observations in a wide variety of disciplines strongly suggest an extraneous 'mind' at work in reality (Berlinski et al. 2019). In a growing number of instances, it seems as if intelligence had to be 'inserted' into reality at specific times, while the incredible complex nature of information stored in various structures in living organisms

also cannot be readily explained without accepting external influence of some sort. Theories depending on random chance increasingly fail to propose acceptable mechanisms of how reality originated and how everything seem to be integrated into a finely tuned whole (Berlinski et al. 2019). The burden of proof has thus shifted from scientists accepting the probability of ID to materialistic reductionists, who increasingly struggle to come up with plausible theories.

Currently, many of the reductionist arguments have a ring of desperate hollowness, and in several instances, such scientists revert to what they have been accusing ID proponents of doing all along, which is personal attacks and 'playing to the audience' when their theories fail to explain the most recent data.

The truth of the matter is that in peer-reviewed literature, a growing number of evolutionary biologists are acknowledging fundamental problems with random, unguided processes (https://www.discovery.org/id/faqs/). Specifically, regarding evolution, scientific objections to Darwinian processes are increasingly being accepted by the evolutionary biology scientific community (Müller 2017). Small-scale variations are explained very well by the theory of evolution, but not the arrival of new species. Many evolutionary biologists are looking for a new theory with creative power. This is, however, astonishingly contrary to the way evolution is portrayed to the world in textbooks and science popularisers.

Design arguments have been part of science since ancient times, for example, the ancient Greeks, Newton, Boyle and Kepler, while normative methodological naturalism has only gained credibility since the late 19th century. Methodological naturalism limits the intellectual freedom of scientists by forcing them to decide in advance that science is not allowed to consider any theory of 'mind', even if it offers the best explanation by far to explain contemporary observations. If a scientist *a priori* excludes 'mind' as an explanatory principle, science is left with an impoverished understanding of the world. It prohibits scientists to follow the evidence to where it logically leads.

Philosopher of Science Thomas Nagel (2012), an atheist, published his book entitled 'Mind and Cosmos – How the Neo-Darwinian Materialist View of Reality Is almost Certainly False' in 2012. In this book, he states:

> What I am convinced of is the negative claim that, in order to understand our questions and judgments about values and reasons realistically, we must reject the idea that they result from the operation of faculties that have been formed from scratch by chance plus natural selection, or that are incidental side effects of natural selection, or are products of genetic drift. (p. 125)

Theistic implications

While ID does, to a certain extent, answer the question of meaning and purpose, it is necessary to know who/what was/is the intelligent designer before the theory will have any fundamental value to society. Are we dealing with a transcendent intelligence (like God) or an immanent intelligence within the cosmos (e.g. advanced aliens)?

The current accepted theory of the beginning of the universe relates to a massive explosion that originated from nothing – the so-called Big Bang. The anthropic principle shows that dozens of scientific parameters (e.g. the strength of nuclear, magnetic and electrical forces; the speed of light; and configuration of mass energy) must already have been incredibly fine-tuned at the moment of the Big Bang for the universe to exist at all (Lewis & Barnes 2016:290).

Because before the singularity (the very beginning of the universe) nothing existed, it follows that the intelligence that caused the laws of the universe and anthropic fine-tuning must be transcendent, in other words an almighty God. The anthropic principle furthermore defeats theories to get around theistic implications, such as the multiverse, string theory and quantum cosmology (Lewis & Barnes 2016:296).

Conflict between faith and science?

Does the fact that contemporary science increasingly points towards ID mean that there is no conflict between faith and science? If we look at the state of the earth (e.g. poverty, climate change and loss of biodiversity) as well as pain and suffering caused by the occurrence of terrible illnesses, bacteria, viruses and war, the hypothesis of the involvement of a superior intelligence poses significant questions when considered from an ethical context.

The theory of ID, however, completely refrains from venturing into any metaphysical implications, such as understanding life and its various manifestations or the purpose of being. The question of who/what the 'Mind' is/was remains a theological issue that the theory of ID is unable to answer. This leads to the theory being criticised in especially the theological discourse on science and faith, as demonstrated by authors such as Alumkal (2019:ix), Bartholomew (2016:2), Ellis (2010:57), Kojonen (2016a:220, 2016b:309), Laing (2019:2) and many others.

Intelligent design – A reformed view

It is submitted that ID as a scientific theory only has fundamental value to humankind when embedded in a reformed-theological framework. The apparent flaws in reality are the result of the fall of humankind and not of God who made 'errors' during the creation process. God's initial creation was good and the current broken reality is solely the result of humankind's disobedience, to which God reacted by sacrificing his only-begotten Son as Saviour for all who believe in him.

Thus, although contemporary scientific observations strongly support the theory of ID, the theory on its own remains just another theory that offers no hope for humankind, except when studied in the context of reformed theology. Although many religions strive towards the reconciliation between faith and science, it is argued that complete harmony is

possible only if Jesus Christ is recognised and accepted as Mediator and Saviour of all creation.

The theory of ID resonates with Thomas Aquinas in the sense that it indicates that, although some scientific and religious questions are separate, many are intertwined, such as the substantial agreement on, for example, the origin of the universe (the 'Big Bang theory' vs. 'In the beginning'….), as well as that life was designed and did not come about as the result of a random, unguided, materialistic process.

Contemporary scientific discoveries therefore provide a unique opportunity for theology as a whole, and in particular reformed theology, because more and more scientists come to the conviction of the existence of an external locus of control. Christians must therefore continue to preach the Gospel to the world with more zeal than ever.

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