

Design, designers and the Designing God: A critical look at some models

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Abstract

This paper examines some of the main positions in the debate on intelligence, design and purpose in nature. It seems that the machine metaphor with its ostensible Deistic implications, introduced by Boyle and Paley, still haunts discussion today as is clear from the anthropic principle. To deal with the issue, some ideas from the side of naturalism are discussed (Dawkins and Davies). The strict naturalistic approach of Dawkins is valued but also criticised for its lack of appreciation for the way humans perceive the world and thus view it through the lens of religion and spirituality – a quality Paul Davies tries to accommodate to some extent. Some comments are made on the ideologically based intelligent-design movement which utilises the concept of intelligence to prove a creator (Shannon, Dembski). From a theological perspective, the concerns expressed by Haught are discussed, namely, a discussion of purposeful design in a way that is less ideological than that of Dembski and Shannon (of the intelligent design movement). The efforts of some theologians (Gregerson, Drees, Rottschaefer and Pannenberg) are discussed in order to reach a conclusion which endeavours to do justice to naturalism as well as theological and spiritual concerns.

1. A PURPOSELESSLY DESIGNED UNIVERSE?

The science-religion dialogue hinges on the intelligent design principle. The design-argument separates naturalists from super-naturalists as is poignantly expressed by Ruse (2002:592):

Embrace science and you are on the way to methodological naturalism or atheism, and that is a short step from metaphysical naturalism or atheism. Insist on religion and you must reject science, the most important and successful and powerful phenomenon in modern culture. Go with science and you are into the machine metaphor, and that leads to the end of God and the

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world picture associated with him. Go with God and you turn your back on the modern world and on the reality that is thrust upon you every time you drive a car or cook a meal or use a computer. You must choose, painful as that will be. The legacy of Boyle is with us today, and its problems cannot be avoided. You go with the cold comfortless integrity of Dawkins and his fellows, or you slide back into the sticky morass that is the hallmark of so much contemporary writing on the science-religion relationship.

The “either ... or” option Ruse puts before us, seems quite fatalistic. This article would like to ponder views from both naturalism and supernaturalism as well as initiatives endeavouring to find some middle ground. The anthropic principle is akin to the design principle and will be discussed briefly. On the side of the naturalists Boyle, Paley, Davies, and Dawkins, will be focussed on while on the side of the supernaturalists Haught, Dembski and Shannon will be referred to. Thinkers like Gregersen, Drees and Moltmann, occupying a middle position, will be mentioned briefly.

1.1 Design and designers

Nothing appears as fascinating to the human mind as design. It is as if our minds are programmed to identify and appreciate design, even if we are not involved in the design itself. Man as *homo faber* cannot produce anything without a plan, blue print or some form of design in mind. We notice design, copy it, improve on it, patent it, and incorporate it in our lives. We almost invariably link design to a designer – unplanned and authorless design is rare and mostly relegated to incidental patterns with some aesthetic value. We link design to purpose be it aesthetic, pragmatic or functional. The Latin word *designare* means to mark out, like an architect marking out the lines of a building. *Designare* refers to any activity according to a plan and purpose. Although the concept of design implies a plan, intention and purpose, this is not necessarily always the case. Many patterns found in nature create the impression of beauty and design, while it is the consequence of the enactment of brute physical laws.

Although humans view themselves as purposeful designers, design is not limited to the human world and human activities; it is present in animate and in inanimate nature, although not in the same manner.¹ For many, nature, nonhuman nature, cannot design itself and God is seen as the Great Designer, responsible for all the magnificent displays of design humans could identify.

¹ Aristotle, when it came to actual science, tended to leave final causes to the sphere of the biological – it makes sense to ask the purpose of the eye but not of a stone on the seashore (Ruse 2002:584)

Davies (1999:122) warns us of the danger, especially in the natural sciences of projecting onto nature categories derived from the world of human affairs as if they are intrinsic to nature itself. Frank (2004:114) indicated the circularity of the intelligent design inference. Human design principles arose from the study of physical order and mechanism in nature, apparently from the earliest days. Therefore, to recruit the physical order and mechanism in nature to support a conclusion of purposeful design in nature by analogy of human purposeful design inheres an invalidating circularity.

Are we then to accept that there are no purposes in nature? “No”, says Peterson (2003:193), all design arguments are not necessarily false. Human beings are products of nature and if humans have purposes, then at some level purposefulness must arise from nature and thus be inherent in nature. We regularly and successfully apply design inferences in the human world, it is clearly legitimate to do so. The challenge is to generalise the design argument in a clear and intelligible way.

There are aspects of the world that ostensibly cannot be explained without recourse to final causes,² and that implies design. In this sense, causality is directly linked to the design argument. The idea that every event has a cause is, however, not an empirical observation or a generalisation from experience, but an indispensable presupposition of human thought. (This presupposition was criticised by Hume who attacked the teleological argument which presupposes an initial Designer of a static mechanical world.) Causality is a general form by means of which the mind unifies the chaos of discrete data (Barbour 1997:45). Aristotle’s inclusion of the final cause in his analysis of the physical and biological worlds and the Stoic’s inference of the existence of God from biological complexity, point to the early existence of arguments regarding purpose and design (Peterson 2002:8). We can note in this regard that natural science usually deals with the *causa materialis*, *causa formalis* and *causa efficiens*, but never with *causa finalis* which represent the teleological idea of purposefulness. This was exactly the position of Descartes (quoted by Ruse 2002:589) who held that:

² The aim (teleology) one has in mind in making something and the effort to realise (effect) it, are expressed in Aristotle’s *causa finalis* and *causa efficiens*. This presupposes the mere factuality (*causa materialis*) of raw (*causa formalis*) material. The *causa materialis* and *causa formalis* and surface in the ontological proof of God where it is argued that someone or something must be responsible for that which is. The *causa finalis* and *causa efficiens* are used to express the aim God had in mind with creation, which is His harmonious relationship with man (see the so called teleological proof of God). Things were made towards a specific end (*causa finalis*) and there was someone who actually performed what he had in mind (*causa efficiens*). This can be read from nature (the universe) which mirrors the glory and plan of God.

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when dealing with natural things, we will, then, never derive any explanations from the purposes which God or nature may have had in view when creating them and we shall entirely banish from our philosophy the search for final causes. For we should not be so arrogant as to suppose that we can share in God's plans.

The role design-arguments play in theological arguments for the proof of God is well known. Design arguments appear as early as Cicero in the 1st century BC and were used by early theologians such as Irenaeus and Origen. In theology, design was used in the ontological and teleological arguments to prove the existence of God. Design arguments had their heyday in the wake of the scientific discoveries of the 16th and 17th centuries. In the rather mechanistic worldview of the Renaissance, God was seen as a kind of clock maker or engineer. Boyle (1627-1691), well known for his gas law (for a fixed mass of gas, pressure is inversely proportional to volume), replaced the Aristotelian notion that nature, somehow has a being and a kind of mind or life force of its own, with the metaphor of a machine or a clock to explain creation. His idea was not to take soul out of the universe and to substitute it for a godless machine, but to indicate how God allows the universe to run. He was accused of Deism but was in actual fact against it. He thought that God creates the universe and then holds it always in his hands. If God quits at any moment, everything collapses (Ruse 2002:588).

The question is whether the machine truly implies a machine maker. It may be a matter of a self-making (autopoietic) machine, in which case the watchmaker (process of biological evolution) is blind (Dawkins 1986) and has no purpose in mind apart from its own existence. To stick with the machine metaphor and not to move beyond it to the machine maker idea is to refute the Aristotelian final cause or the idea of the purposefulness of the world.

William Paley's example of the watchmaker³ was recently opposed by Dawkins's idea of the blind watchmaker. Paley's argument from design was especially vulnerable, because it started from an observed adaptation of organic structures to useful functions. Such adaptation could now be accounted for by the impersonal process of natural selection without invoking a preconceived plan. Adaptations are present today because they were useful in the past. The species living now are here because they have survived, while thousands of others lost out in the competitive struggle (Barbour 1997:58).

³ William Paley ([1802] 1986), in his work *Natural theology*, said that if we find a watch in a field, the watch's adaptation of a means to an end ensures that it is the product of intelligence and not simply the result of undirected natural processes. So too the marvellous adaptations of a means to an end in organisms, whether at the level of whole organisms or at the level of various subsystems, ensure that the organisms are the product of an intelligence.

Since Darwin, an entirely naturalistic scenario which differs from the mechanical one, has been presented. Darwin's theory of natural selection led to the demise of design arguments from the latter 19th to the 20th centuries. Natural selection argued for the possibility of design without intelligence, and biologists began to abandon the concept of design. In philosophy, design-arguments were questioned by Hume who ridiculed claims about detecting the intention of God from the nature of the world. Since the world is full of evil and suffering, one might legitimately infer a wicket designer (see Peterson 2003:189). In particular, Darwin drew attention to imperfect designs (adaptations) where nature seems to have worked moulding the materials at hand for a new environmental niche, but in which the design sometimes seems less than optimal. Gigenrich (2000:122) gives the example of the red-footed booby, a duck that nest in trees on Genovesa Island in the Galápagos. It's webbed feet make it virtually impossible to balance on a branch.

2. THE CASE FOR PURPOSEFUL DESIGN IN THE ANTHROPIC PRINCIPLE: THE UNIVERSE DESIGNED FOR THE ADVENT OF MAN?

The design arguments were taken seriously again in the late 20th century, mainly because of the anthropic principle in the science-religion debate. The science-religion dialogue can be said to hinge on the argument of design. The amount of literature dealing with the anthropic principle, which is but a principle from design, underscores this. The anthropic principle refers to the coincidences that govern the growth and development of the universe, coincidences so improbable that they appear to rule out random variation. On the weak form of the anthropic principle, the argument goes that since we exist, it is necessarily the case that the kind of universe we observe is one that is structured to support life. The strong anthropic principle adds that not only is the observable universe structured to support life, but a life supporting universe such as our own is the only possibility (Peterson 2003:190).

The anthropic principle is not much different from the metaphor which views the world as a machine or clock work. While the metaphor of nature as clockwork focuses on the fact that it runs automatically, the anthropic principle stresses the complexity and fine-tunedness of the universe and our world. The anthropic principle, however, endeavours more than the clockwork metaphor, to accommodate Gods action in the creation process.

Wesley Wildman has placed the divine action programme (DAP) before it's Rubicon, according to Clayton (2004:189). A theory of special divine action could succeed only if it offered an account of God's special action in the world that, (1) made that objective; (2) was incompatible with a determinist scientific

explanation of the data; (3) did not involve God “intervening” into natural order (e.g. setting aside natural law); and (4) construed the laws of nature as ontological (not merely descriptive) (see Wildman 2004:57). Wildman believes one can know in advance that no theory of special divine action could satisfy the four criteria. He concurs with the Kantian notion that an ultimate dualism exists between accounts of the world based on science and those based on the notion of free agency (whether human or divine). Determinism (causality) and freedom are mutually exclusive of another. For Kant, we can only reconcile categories of causality and human freedom in compatibilist fashion by postulating human freedom as a condition for the possibility of our experience; we can never demonstrate its consistency with a causal, scientific account of nature (Wildman 2004:57-58). The author of this article sides with Wildman, in viewing the divine action programmes that seek “traction with science” as an unconvincing repetition of a more sophisticated “God-of-the-gaps-argument”.

3. THE STANCE OF NATURALISM

3.1 Davies and moderate naturalism: information as determinative value in the origin of life

Life can be viewed, among others, as a chemical phenomenon, but its distinctiveness lies not in chemistry as such but in its informational properties. A living organism is a complex information-processing system (Davies 1999:19). Life is a dynamic state of matter organised by information. The mysterious emergence of *meaningful* information seems to be related to the origin of complexity, the interplay of chance and necessity,⁴ and information flowing from the environment. There is a long evolutionary history behind information. Information, as supreme biological value responsible for all other identified biological values, also determines human cultural values, although on a different level.

Information does not come easily. It takes the tiresome evolutionary process of gaining knowledge, through an information processing process that would increase an organism’s fitness (Van Huyssteen 1998:148). Although the evolutionary process of acquiring cognition is a tiresome one which spirals up the trail of trial and error, it is a process that leads to the emergence of new and qualitatively different forms of order.

⁴ Chance and necessity do not rule out purposefulness. Purposefulness is inherent in nature. This can be seen in random mutations and natural selection which eventually proceed up the way of beneficial purposefulness for the organism.

The source of information in the natural world can only be the environment of the organism, which begs the question how the information got into the environment in the first place. Although information was present from the very start of the creation process, we know that the early universe started out with very little information. For Davies (1999:60ff), the outstanding question is not where matter came from, but where information came from. Information and matter can be distinguished, but not separated. Only the combination of matter-energy and information can explain life. Matter and energy are prerequisites for informational possibilities to open up (see Rolston 1999:356). The ex-nihilo formation of matter and energy is explained by gravitational processes. Due to gravitation and gravitational processes, an entropy gap between the actual entropy and the maximum possible entropy opened up in the universe. The reason the universe can have zero energy and still contain 10^{50} tons of matter is that its gravitational field has negative entropy. All sources of free energy, including the chemical and thermal energy inside the earth, can be attributed to that gap. With matter-energy comes information. The ultimate source of biological information and order, therefore, is gravitation (Davies 1999:61, 64). The gravitational source, however, does not explain the ex-nihilo appearance of information and life.

Entropy, indicating the irreversible change from order to disorder along the directionality of time, affects life. Davies (1999:57) believes that life avoids decay via the second law of thermodynamics⁵ by importing information from the environment. The environment (including the ecological and later the cultural environment) in which life originates is as important as matter and information. Information has downward causative power, coming from the environment which makes the interplay between chance and necessity possible (Jacques Monod). Environmental information is seemingly an infinite source to tap. Values, which are a condensed form of information, can be considered to be a negative form of entropy. Values are comparable to symbols which encapsulate meaning. Values are a source with a wide range of applicability. Although it may change from time to time, it is not easily depleted.

⁵ The second law of thermodynamics specifies that in a closed system the total entropy cannot go down. Nor will it continue to rise unlimited. There will be a state of maximum entropy or maximum disorder which is thermodynamic equilibrium. Applied to biological evolution, it means the constant flow of energy and information. The general struggle for life is for entropy to become available by the transition from the hot sun to the cold earth. This is only the source. Life is always on the lookout for metastable sources of free energy to exploit. Life turns back on its sources to make resources from them. Animals burn organic material. Organisms control the release of energy through chemical reactions. On the level of information, the appearance of a new species marks an increase in order. The price paid for this gain is the thousands of unsuccessful mutants (see Davies 1999:50-55; Rolston 1999:41).

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3.2 Neither purposeful design nor mere chance: design as the outcome of cumulative selection: the closed naturalism of Dawkins

Richard Dawkins can be seen to represent methodological naturalism, which being a closed system, allows no reference to transcendental or miraculous forces enacting upon nature. Davies differs from Dawkins in allowing the possibility of divine action, although he does not elaborate on this and keeps his argumentation within naturalistic confines. Dawkins finds no mindful creator designing creation. If a watchmaker exists, he is blind and devoid of any purposefulness. The basic idea of *the blind watchmaker* is, according to Dawkins (1986:181), that we do not need to postulate a designer in order to understand life, or anything else in the universe. Instead, creation – with its beauty and bountiful examples of design – is the product of cumulative selection. Cumulative selection differs from single-step selection in which entities are sorted once and for all. In cumulative selection, the successful results of one process are fed into a subsequent process and so on. The end product of one generation of selection is the starting point for the next generation ad infinitum. Once cumulative selection has got itself properly started, we need to postulate only a relatively small amount of luck in the subsequent evolution of life and intelligence (Dawkins 1986:55, 179).

In evolution debates, the idea that life on earth is the product of random selection was compared by many to the chance that a monkey bashing away on a typewriter could produce the works of Shakespeare. Dawkins (1986:56ff) uses this example to explain the idea of cumulative selection. If we take the

phrase *methinks it is like a weasel*, the chance of getting the entire phrase of 28 characters right is $1/27$ to the power of 28, that is, $1/27$ multiplied by itself 28 times. The odds against single step selection of random variation are simply too big to make it successful. In the case of cumulative selection, we begin once again with 28 letters on the typewriter, we set the target phrase *methinks it is like a weasel* and programme the computer to breed from the random sequence of 28 letters just like before.⁶ It duplicates it repeatedly, but with a certain chance of random error – mutation – in the copying. The computer examines the mutant nonsense phrases, the progeny of the original phrase, and chooses the one which, however slightly, most resembles the target phrase. After 43 generations, the target was met *and the sentence methinks it is like a weasel* was produced. This brings Dawkins (1986:60) to conclude that evolutionary progress, if it were to rely on single-step selection, would never have got anywhere. If, however, there was any way in which the necessary conditions for cumulative selection could have been set up by the blind forces of nature, we can understand how life originated. Important to note is that Darwinian evolution is not random.

Chance is a minor ingredient in the Darwinian recipe. Dawkins's watchmaker thus is cumulative natural selection. Evolution is blind to the future and has no long-term goal, which is not to say that the end product of millions of years of development is not so magnificent that humans cannot but propose a mindful and intelligent architect who blueprinted it all at the very beginning. The latest product of millions of years of history of natural selection consequently displays such fine-tuned structures and success stories of adaptation and environmental interaction that the human mind cannot but see intelligent design.

The viewers of the latest, present-day outcomes of cumulative selection processes find it difficult to conceptualise how all the fine-tuned prerequisites could have been met through the process of cumulative selection. Take the human eye, for example. For the eye to work, the following minimum perfectly coordinated processes have to take place. The eye must be clean and moist, maintained in this state by the interaction of the tear glands and movable eyelids, whose eyelashes also act as a crude filter

⁶ Artigas (2000:133) finds Dawkins's argument tricky, because he introduces a teleological component in his monkey computer game when he inscribes in the program the instruction to choose(s) the one which most resembles the target phrase. It is difficult to formulate a statement that is more teleological, for it includes the existence of a target and the selection of the phrase closest to it. In pure Darwinism, supported by Dawkins, natural selection is supposed to be blind and to have no purposes at all. Although the result of natural selection will be the survival of the fittest, each step of that kind is unique and should not be considered as forming a progressive series that tends toward an increasingly perfect goal. Artigas, consequently finds Dawkins's argument deceptive. In favour of Dawkins, one must concede that natural selection does have a purpose, but in the limited sense of preserving that which best suits the target of survival and the best interaction with the environment.

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against the sun. The light then passes through a small transparent section of the protective outer coating (the cornea) and continues via a lens that focuses it on the back of the retina. Here 130 million light-sensitive rods and cones cause photochemical reactions that transform the light into electrical impulses. Some 100 million of these are transmitted every second, by means that are not properly understood, to a brain which takes appropriate action (Dawkins 1986:96-102). Dawkins argues that we need not presuppose that the eye must function as a whole or not at all. Predators would be able, even with only 5 percent eyesight to detect prey. Five percent vision is better than no vision at all. The same goes for the development of all other body parts and organs. The basic rationale is that, if design is good enough to evolve once, the same design principle is good enough to evolve twice, from different starting points, in different parts of the animal kingdom (Dawkins 1986:115-116).

The basic ingredient of cumulative selection is self-replication. There must somehow, as a consequence of the ordinary laws of physics, come into being self-copying entities – called replicators by Dawkins (1986:158). This role is filled today by DNA molecules. Dawkins (1986:172-173) mentions that some see the dependence of cumulative selection on machinery of replication as the ultimate proof that there must originally have been a designer, not a blind watch maker, but a far-sighted supernatural watch maker. This is, according to Dawkins, to explain precisely nothing, for it leaves unexplained the origin of the Designer. You have to say something like God was always there, and if you allow yourself that kind of lazy way out, you might as well just say DNA was always there, or Life was always there, and be done with it. Dawkins continues remarking that the more we can stay away from miracles, major improbabilities, fantastic coincidences, large chance events, the more thoroughly we can break large chance events up into a cumulative series of small chance events and the more satisfying to rational minds our explanations will be. Dawkins proposes several options, within the framework of cumulative selection, of how the building blocks may have come together to form self-replicating systems. With reference to Cairns-Smith, Dawkins (1986:183) mentions the possibility that self-replicating inorganic crystals such as silicates, could have paved the way before organic replicators and eventually DNA have taken over. Dawkins's approach represents that of a closed system allowing no transcendent interference in natural processes.

4. THE SUPERNATURALISTIC APPROACH

4.1 The employment of the information-concept in the intelligent design movement

The history of human culture can be divided into the Matter Age, the Energy Age and the Information Age, and the corresponding societies can be designated as the agricultural-instrumental, the industrial and the information society respectively (Van der Lubbe & Laurent 1992:84). In the light of the rapid development of information technology over the last two decades, it is understandable that the concept of information will play an important role in the science-religion debate.⁷

In information theory, information is fundamentally related to uncertainty. Information decreases uncertainty. It assumes an event to be a realised possibility from a well-defined set of possibilities or possible events. Before the occurrence of the event, the observer is uncertain about what event will occur. The actual happening of the event itself removes this uncertainty. It is not only the number of events that is important, it is also their probabilities. If some events are more probable than other events the a priori uncertainty will be smaller; if all events are equiprobable, the a priori uncertainty will be maximal. The measure of information is some function formulated in terms of probabilities.

The informational world-view, based on certain characteristics of information theory, considers the world not in terms of objects but as being built up from events, related to each other by time-space relations. Events are the result of the melting together of possibilities and factualities. The sequence of events does not consist of identical events – in which case no change will take place. On the other hand, all events have something in common, since the world and events show continuity. Looking back at chance from any one event to another, one sees that something like a selection has been made from a number of possible events. Looking forward there is a set of possibilities from which it is not clear which one will be selected (Van der Lubbe & Laurent 1992:86).

⁷ God can be seen as the sublime Informaticus. He can be considered to limit the multiplicity of unbound possibilities and to unify them in the ordered cosmos. God is related to all possibilities which he grasps conceptually as well as to all factualities or events which He takes into His experience. As such, God influences the world, but the world also influences God. These ideas correspond to process theology (Van der Lubbe & Laurent 1992:87). When applied to the world of nature, it is a postulate which cannot be verified or falsified. On the human plane, God can be viewed by believers as the ultimate source of information, who creates possibilities and invites man to make those selections which give rise to possibilities which lead to the creation of harmony and order. However, this order is not given a priori. God does not know of which chance man will make use (Van der Lubbe & Laurent 1992:88-89).

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Intelligent design (ID) theorists like Claude Shannon and William Dembski have sought to reintroduce the notion of divine design as a scientific hypothesis to be considered alongside and in place of naturalistic accounts of cosmic and biological origins and change. Intelligent design is said to apply to physical cosmology, biochemistry, human evolution and cryptography. Dembski (2001:224) considers intelligent design a new programme for scientific research with the fundamental claim that intelligent causes are necessary to explain the complex, information-rich structures of biology, and that these causes are empirically detectable. The main area of contention, however, has been biology and evolution. ID theorists are opposed to naturalist explanations of biological complexity, and offer the hypothesis of intelligent design as a superior alternative. ID theorists argue that some organisms are intelligently designed and that they are intelligently designed by God. If ID theorists like Dembski and Michael Behe are correct, then according to Peterson (2002:7-10, 12), it would be the most significant scientific theory ever, for it would in essence prove the existence of God. ID theorists work predominantly with the four propositions of deep time, a limited role for evolution, a method for detecting design and the applicability of the method of biology. ID theory does not compete with evolutionary accounts of biological origins and the origins of species, but is rather a modification of such accounts (Peterson 2002:15). For example, design features are ascribed to saltationism – the sudden change in the structure of organisms – which according to them does not result from either chance or natural selection. Peterson (2002:16, 20; 2003:195) points out that ID theorists never define what exactly is supposed to count as intelligence. They do not specify what percentage of organisms exhibit intelligent design, nor whether some lines of descent display more design than others. Does God have a fondness for the millions of species of insects, or are they simply the product of natural selection? Are human pathogens such as cholera and malaria intelligently designed? Although they suggest the existence of a creator, they cannot tell anything about the character or nature of the creator. For Peterson (2002:17), an intelligent-design theory that refuses to say anything about the designer is either confused or incoherent – which brings him to the conclusion that ID theory, lacking a theological science to complement its biological science, is limited to a negative approach that explains by not explaining. This critique seems justifiable especially in the light of Dembski's (2001:225) claim that intelligent design presupposes neither a creator nor miracles. Intelligent design is theologically minimalist. It detects intelligence without speculating about the nature of the intelligence. This brings Peterson (2002:22) to conclude that ID theory is an ideological agenda masquerading as science.

4.2 The moderate supernaturalism of Haught

Haught laments the loss of the whole in explanatory systems and stresses the importance of meaning-giving purposefulness to humans. The intelligent design movement sets out to prove the Intelligent Designer. The designer they refuse to comment on is the Theistic God of Christianity – a reality Haught takes as point of departure.

Religious cosmologies embed the temporal world within an eternal and sacred reality immune to transience and death. This means that the lower levels of the cosmic hierarchy are constituted and informed by an ultimate level of meaning flowing down from the highest to the lowest level in a Great Chain of Being. Hierarchy must here be understood in the literal sense of the word, meaning that all things have their origin or principle (*arche*) in the domain of the sacred (*hieros*). This original meaning has been devastated, according to Haught (2000a:106; 2000b:60), by the way natural science has atomised and historicised nature. Atomism understands things solely in terms of their fundamental physical constituents. It dissolves hierarchies by blurring the boundaries and ontological discontinuities that formerly set one level decisively above or below another. Astrophysics has historicised the cosmos, giving a picture of nature which, when joined to evolutionary accounts of life, instantly crumples what had formerly been thought of as a vertical hierarchy of distinct levels of meaning and being (Haught 2000a:106). Lifeless and mindless matter is taken to be the metaphysical and historical source of all beings, including those now endowed with life. And since matter is taken to be metaphysically mindless, the cosmos that evolves from it must be essentially mindless, even if evolution eventually and accidentally brings forth some beings with a capacity for thought (Haught 2000b:59).

With reference to the tradition of vitalism, Haught (2000b:61) mentions that the claim that lifeless matter might autonomously give birth to life violates the principle of causation. Henri Bergson (1854-1941) thought that matter derived its being and meaning only from the fact that it somehow serves the eventual emergence of life. The discovery of deep time, along with the atomisation of nature, has helped vanquish the intellectual need for a hierarchical cosmology. A truly mammoth span of time provides opportunity enough for purely accidental coincidences to give rise to life. In the scientific world of today, vitalism has lost out and time itself has quietly become a main ingredient in the explanation of life (Haught 2000b:62-63). Haught finds the central task of theology after Darwin in the recovering of religious hierarchy and in convincing natural science to accept it.

The magical word that might enable this is information. The suspicion, according to Haught (2000b:70), is growing to such an extent that more

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complex levels cannot be understood simply in terms of the less complex, for something always gets lost in such a facile translation. This something is information. Information insinuates itself into the universe without in any way violating lower-level laws of chemistry and physics. Information, therefore, has the capacity to bring about hierarchical discontinuity among various levels, even though, when viewed in a purely historical or atomistic way, nature seems to be a closed and purely horizontal continuum (Haught 2000b:71). Information quietly orders things, while itself remaining irreducible. It has, like mathematics, a certain timelessness to it. It abides patiently in the realm of possibility, waiting to be actualised. It lies, in a sense, outside time, undevoured by the historical or horizontal scheme of physical causation. It is sufficiently real to configure nature hierarchically. Though beyond the grasp of science, information is not identifiable with sheer nothingness (Haught 2000b:71). Haught suggests (2000b:75) that a study of the way information works can help us understand how a hierarchical shaping of meaning or purpose can become implanted in an evolving universe without having to be obvious at the level of scientific inquiry. Information works by integrating particulars into coherent wholes. We may assume, alleges Haught (2000b:76), that the origin of information and its integrating capacity resides in some other logical space than that of the atomic and historical particulars that natural science appeals to in its modern ideal of explanation. It is unnecessary to mention that Haught believes that God could be seen as the ultimate source of the novel informational patterns available to evolution (2000b:73).

The hierarchy model posing the holy as the source of being, is threatened only if one considers the cosmological and evolutionary model as a closed system. There are models available that accept the natural scientific model without forfeiting the presence of the holy and the action of God in the creation process, of which panentheism is one. To limit God to information input in the creation process runs the risk of rendering God redundant once apt explanations for information input is proven. Dawkins's accumulative selection, proposal and developments in molecular biology, accompanied by a better understanding of the development of genetic coding, make this risk very real. The limitation of God's action to information input is a regression to the dualistic hardware-software model. Information cannot be divorced from its manifestation in matter. Haught's philosophical employment of the metaphysics of nonbeing to explain how things come about is not helpful either. The use of information as proof of God has taken on ideological proportions in the intelligent design movement. This, however, does not diminish the importance of the concept of information to explain the origin of life. It all depends on how one employs the concept of information.

5. SPACE FOR GOD IN CREATION: SOME OPTIONS

There are also a few other variants on the design theme that deserve attention. We shall briefly ponder on the model of autopoietic systems, the ideal of supernaturalism and finally Moltmann's comparison of the scientific concept of *fields* with the spirit of God.

Gregersen (1998:133) finds it possible to be simultaneously an evolutionist and a believer in God, to hold onto creation faith and to evolution. God is not just somehow behind life-processes, he is present in them. He is not only the pre-moral initiator of a pre-moral world, he is also the moral inspirer of sentient beings, like humans and higher mammals (Gregersen 1999:130, 138). His main thesis is that God creates and transforms the world through supporting and stimulating self-making systems (Gregersen 1998:354). God is a triggering cause, who is switching in and out of order to hold the course of history on track. God does not, however, do anything that replaces the ordinary operations of nature. He is the underlying causality that enables creatures to trigger themselves in their given setting (Gregersen 1998:358-359). God is continuously upholding the reproductive and self-productive capacities of matter from the simplest to the most complex forms. As Creator of the self-evolving world then, God is continuously acting amorally or premorally (since randomisations occur with no distinction between good and evil), but God is not acting immorally, that is, with an evil intent (autopoietic theodicy?) (Gregerson 1998:348,351 ff, 355). God is the compassionate co-sufferer of the trials and errors, accomplishments and breakdowns of creatures.

Wim Drees (1996:196 ff) views the design argument as a more open approach to evolution. The emphasis is on the idea that the natural order displays evidence of design. As is the case with creationism, the options presented are mutually exclusive: either one accepts that order is the product of purposeful design or one accepts chance, since natural selection operates on variety due to random mutations. He proposes instead a mediatory approach. In this approach, Christian beliefs are not considered to be necessarily inconsistent with the evolutionary origin of species. The question of God's action in the world is dealt with in different ways. Some see divine action hidden in what science calls chance; others see chance as chance also from God's side. Others again opt for God as the primary cause of the evolutionary process, the laws of nature and the required initial conditions, while holding the evolutionary account to be complete in itself, without requiring any special divine action within the realm of causality. Theological positions may be reconsidered and reformulated to defend the consistency of scientific knowledge and religious convictions.

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Naturalism stresses the continuity between human beings and the rest of nature. Traditionally, the naturalist insists that the world of nature should form a single sphere without incursions from outside by souls or spirits, divine or human. Ethical naturalism, for example, does not accommodate non-natural values. Drees proposes a scientifically informed naturalistic account of religion, which he contends, is not only compatible with supernaturalistic religion and theology but provides a better account of both than either pure naturalistic or pure supernaturalistic accounts. He accepts that ontological naturalism offers the best philosophical account of the natural world and that it provides the opening for a supernaturalistic understanding of religion and theology (Rottschaefter 2002:407). Drees (1996:212-213) views humans, their cultures, languages, aesthetic and moral codes, and their religious practices, as a result of a natural, evolutionary process.

William Rottschaefter's basic point of departure is that questions about the existence and nature of transcendent reality are empirical questions in the same sense that theoretical scientific questions about in-principle unobservable physical entities are empirical. Thus, explanatory theories about ultimate reality are justified in the same manner as are high-level scientific theories. Such theories are evaluated by the best current scientific theories, the best current empirical findings and generally accepted facts (Rottschaefter 2002:446). He proposes a naturalistic divine reality and not a supernaturalistic one! A naturalistic divine reality does not, more than likely, possess the classical divine Semitic attributes such as personhood, omnipotence, omnibenevolence and eternity. Nor does it, more than likely, possess the classical divine attributes ascribed to it in the Indian tradition like those of mind and absolute unity. A naturalistic divine reality may be in the process of becoming and may itself also suffer demise (Rottschaefter 2002:447). In a sense, his God would be similar to the present understanding of the processes that created the universe.

In opposition to a mechanistic interpretation of the world, we can understand all matter today not as being passive and inert, but as possessing an inner dynamism. This dynamism is closely related to structure and patterns, insofar as it deploys itself according to temporal patterns and its deployment produces spatial patterns that are the sources of new kinds of dynamism. As we know, all subatomic particles intervene actively in processes in which some particles are transformed into others, new particles are produced and energy transfers occur. For Artigas (2000:90-91), even a single electron, in a metaphoric way, knows physics in its entirety, as it will act according to its own nature in any circumstance. Leibniz (quoted by Artigas

2000:91) already said that all natural entities possess their own dynamism. He saw divine creation as the foundation of this force.

Dynamism is closely related to patterns and patterns entail the idea of design and are linked to the ancient idea of form. In the words of Newell (Artigas 2000:92), patterns appear all over the place – in cloud streets, in sand ripples, on flat beaches and desert dunes, in the morphology of plants and animals, in chemically reacting media, on weather maps, in geological formations, in interacting laser beams, in wide gainband lasers, on the surface of thin buckling shells and in the grid scale instabilities of numerical algorithms.

In the theological realm, dynamism with its ensuing display of design and seemingly purposefulness, is dealt with by Moltmann from the perspective of field theories which he analogically compares to the spirit of God. God is spirit and the scientific term, which, even if it is to a certain extent metaphorical, will throw light on how God's work is comparable to that of field. For Pannenberg (1993:40), the field concept, in contrast to the mechanical doctrine of movement by push and pressure, could be celebrated as inauguration of a spiritual interpretation of nature. Spirit and field are terms of how agency proceeds, with respect to both natural processes and to God's activity in the world (Hefner 2001:804).

Newton introduced the idea of immaterial forces causing material changes. He viewed the way immaterial forces acted in a way analogous to the activity of the soul upon the body. He considered gravity as an expression of the immaterial activity of God moving the universe by means of space. With his introduction of the field concept, Faraday turned around the relation between force and body. The body was but a manifestation of the force that Faraday conceived as an independent reality of the body. The material particle appears as the point where the lines of force converge and form a cluster that persists for some time. A field action is not described by the relationship of separate bodies to each other, but by how those relationships between bodies emerge from the coexistence that derives from their being together in a field. Pannenberg uses the same idea to describe the inner life of the Triune God (Hefner 2001:804). Pannenberg uses the concept of *action* as alternative to ideas of causality. We cannot always infer correctly from causality that it represents the essence of that which causes. In the case of personal action, the essence of the subject may be seen in the choice and achievements of the goals, so that the kind of action characterises the one who acts.

Field theories from Faraday to Einstein claim priority for the whole over the parts. This is of theological significance to Pannenberg (1993:38-39),

because God has to be conceived as the unifying ground of the whole universe if He is to be conceived as creator and redeemer of the world. Pannenberg (1993:41) acknowledges, however, that theological assertions of field structure of the divine spirit's activity in the cosmos will remain different from field theories in physics.

8. CONCLUSION

The choice Ruse put before us and referred to in the introduction of this paper is unacceptable and nullifies the efforts of the science-religion debate to harmonise our understanding of God and the world. The acceptance of either naturalism or supernaturalism restricts us to a sterile dualism. This is reflected in Van der Lubbe and Laurent's (1992:84) notion that the close connection between man's world-view and his idea of God that existed in former days has been replaced by the situation today where world-view (which is synonymous to natural scientific world-view) and the idea of God are clearly separated.

If dualism is not an option, acceptable forms of integration must be found without compromising the integrity of science or that of the human person. Human thought, and that includes the religious and spiritual aspects thereof, is legitimately part of the human primate and can be viewed as a natural phenomenon. This does not mean that we must not critically ponder what we mean by rationality, intelligence, spirituality and the human person. Clayton (2004:188) reminds us that Kant did not anticipate the sociology and anthropology of knowledge. There is not just one categorical framework; cultural and other factors greatly influence one's conceptual scheme.

Religion can be seen as the outcome of the evolution of man. The ubiquitous emergence of religion with homo sapiens is an indication that religion fulfils an irreplaceable function for them. This may very well have been within the will of God. That religion and the way it functions in the lives of humans will undergo an evolutionary change can be accepted. This can also be harmonised with the will of God. Efforts to explain the place and action of God in creation must be appreciated as long as it stands the test of critical thinking.

The dictum of Bonhoeffer that we should seek God in what is known and not in the unknown remains a guiding principle. If we are to find the action of God in the world in what is known, then God's action in and through millions of people who believe in him, experience him, and are guided in their conduct by their belief in him, represents a tremendous and visible exemplar of God's action in this world. The action of God through those who believe is visible, empirical, theoretical and falsifiable. It does not depend on the flimsy evidence of a God-of-the-gaps nature. The main message of most religious books

testify how the world was and is influenced by those who believe and allow God to act in and through their lives in this world. The spiritual worth, existential comfort and life-giving meaning provided by religion could be interpreted as subjective. It is however, real and non-negotiable to those that believes. Theology's main message of the love and forgiveness of God that brings redemption through Christ need not be compromised by accepting science in the naturalistic sense of the word. The challenge is to be honest to God, to man and to nature. Since we are not only rational beings and have to accommodate the phenomenon of faith, we have to accept the integrity of those who accept science and embrace God to express their will to believe.

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