

The Law of Cause and Cosmology

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ABSTRACT

One of the most widely accepted and powerful arguments for the existence of a creator is the existence of the creation. As a watch requires a watchmaker, likewise a creation requires a creator. This is an example of the law of cause which says, for every effect there must be a cause which is both sufficient and logically deduced from experiment and reason. The law of cause is accepted as an axiom and is the basis of science and indeed of our entire society. This argument is used both prominently in the Scriptures and historically, and is today the most profound extra-biblical argument for a theistic world view.

One of the oldest lines of reasoning, and for many people the most convincing, used to argue for the existence of a Creator (and thus the creation model as opposed to the 'pure' or atheistic evolution model) is the law of cause (or 'cause and effect'). As a watch is usually sufficient proof of the existence of a watchmaker, likewise the act of something moving 'proves' the existence of a 'mover', and the existence of a **creation** proves the reality of a **creator**. Called the **law of cause**, this view concludes that **all events have a cause**, to which is often added **except the uncaused first cause**. In Thompson's words:

*'Indisputably, the most universal, and the most certain, of all scientific laws is the law of cause and effect, or as it is commonly known, the law (or principle) of causality. Scientists, and philosophers of science, recognize laws as "reflecting actual regularities in nature". . . . So far as scientific testing and historical experience can attest, laws know no exceptions. And this is certainly true of the law of causality. This law has been stated in a variety of ways, each of which adequately expresses its ultimate meaning. Kant, in the first edition of his **Critique of Pure Reason**, stated that "everything that happens (begins to be) presupposes something which it follows according to a rule." In the second edition, he strengthened that statement by noting that "all changes take place according to the law of connection of cause and effect"'.¹*

The law of cause was the basis of William Paley's

famous 18th century argument for God from natural theology, the term once used to refer to the study of nature.

PALEY'S NATURAL THEOLOGY

In his famous book, **Natural Theology**, Paley appeals to the cause-effect type of reasoning as a primary proof for God's existence.² His most well-known illustration was that, if one found a stone and was asked how it came to be, one could argue that it came to exist naturally or had been there forever. But if one found a watch on the ground and inquired as to how it happened to be there, one could not argue that it came into existence naturally or had been there forever. Does not the argument that 'explains' the existence of the watch also explain the existence of the stone, Paley argued? Paley answers that

'when we come to inspect the watch, we perceive . . . that its several parts are framed and put together for a purpose.'³

The complexity of the watch and the obvious intent of its design and purpose forces the conclusion that the watch must have had a maker who understood its construction and designed it for a specific use:

*'But suppose I had found a **watch** upon the ground, and it should be inquired how the watch happened to be in that place, I should hardly think . . . that . . . the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? Why is it not as admissible in the second case*

as in the first? . . . 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, and that motion so regulated as to point out the hour of the day; that, if the different parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order than that in which they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use that is now served by it.⁴

Paley then turns to the design of the human and animal body as evidence of a maker. Much of the rest of his **Natural Theology** is based upon this reasoning. According to Clark, Paley's argument even influenced Charles Darwin as a young man:

'. . . during his university life he was subjected to two opposed influences epitomizing the forces that were to beat round his head once his theory of evolution had been published. One was that of William Paley, the eminent divine and former Fellow of Christ's [College]. Paley's writings had provided a main argument for those who saw the evidence of heavenly design in nature and for whom Darwin's natural selection was to be quite unacceptable Thus the lens of a fish's eye was more spherical than the lens in the eye of land vertebrates because each was adapted to the refractive index of the medium, water or air. "The marks of **design** are too strong to be gotten over," Paley declared. "Design must have had a designer. That designer must have been a person. That person is God." Paley's [book] **Evidences of Christianity** was compulsory reading for undergraduates, and Darwin not only read it but could write: "The logic of this book and as I may add of [Paley's] **Natural Theology** gave me as much delight as did Euclid." And half a century later he remembered that "getting up Paley's **Evidences and Moral Phil.** thoroughly well as I did, I felt was an admirable training, and everything else bosh."⁵

Darwin's own words eloquently illustrate his high opinion of Paley, even though Darwin later tried to refute the watchmaker world-view:

'In order to pass the B.A. examination, it was also necessary to [master] . . . Paley's **Evidences of Christianity** and his **Moral Philosophy**. This was done in a thorough manner, and I am convinced that I could have written out the whole of the **Evidences** with perfect correctness, but not of course in the clear language of Paley. The logic of this book and, as I may add, of his **Natural Theology**, gave me as much delight as did Euclid. The careful study of these works, without attempting to learn any part by rote, was the only part of the academical course which, as I then

felt, and as I still believe, was of the least use to me in the education of my mind. I did not at that time trouble myself about Paley's premises; and taking these on trust, I was charmed and convinced by the long line of argumentation.'⁶

Although Darwin later discounted Paley's view, many of his later followers could not dismiss it so easily. The president of the American Museum of Natural History and the most eminent early 20th century evolutionist, Henry Fairfield Osborn, later noted that:

'Huxley [the famous evolutionist] once told me that Paley's argument for the direct handiwork of the Creator was so logically, so ingeniously and convincingly written that he [Huxley] always kept it at his bedside for last reading at night.'⁷

Osborn added that

'So long as the chance or fortuitous hypothesis of adaptation reigned, Paley's argument for the existence of God was set aside, but our more profound knowledge . . . gained by direct observation of Nature, leaves Paley's argument just as strong as it ever was: Paley's **Evidences** may be challenged now no more effectively than it could be challenged in 1858.'⁸

A half century later Dawkins concluded:

'It is almost as if the human brain were specifically designed to misunderstand Darwinism, and to find it hard to believe. . . . [The conclusion that] our brains seem predisposed to resist Darwinism stems from our great success as creative designers. Our world is dominated by feats of engineering and works of art. We are entirely accustomed to the idea that complex elegance is an indicator of premeditated, crafted design. **This is probably the most powerful reason for the belief, held by the vast majority of people that have ever lived, in some kind of supernatural deity.**'⁹ (Emphasis mine.)

The realization that the existence of a creation requires a creator (or at least a process which can account for the existence of a creation) necessitates that those who do not believe in an intelligent creator, and yet question the validity of the theory of evolution, to hypothesize some other means to account for the universe's existence. One theory, which was in vogue for a short time partly because of such works as Erich Von Daniken's **Chariots of the Gods**, is the idea that life came from another planet and, in essence, was dropped off here via some type of spacecraft. This idea, though, still does not solve the problem, but only transfers it somewhere else and to another time. We still have to ask **why** or **how** life was created at the place that life supposedly came from.¹⁰

EVIDENCE FOR THE LAW OF CAUSE

The cause-effect law is constantly encountered in daily life. When a mother discovers wet mud tracks on the living room floor, she does not need to personally see the

culprit to deduce what has occurred. The mud is enough proof to at least conclude that **someone** has traversed the floor with muddy shoes. Likewise, the existence of the creation is itself sufficient to prove a Creator because the law of cause proves a force must have made or created what exists. This logic is illustrated by the following conversation that Isaac Newton reportedly had with a friend of his:

‘One day, as Newton sat reading in his study with his . . . [recently completed mechanical model of the universe] on a large table near him, his infidel friend stepped in. Scientist that he [Newton’s friend] was, he recognized at a glance what was before him. Stepping up to it, he slowly turned the crank, and with undisguised admiration watched the heavenly bodies all move in their relative speed in their orbits. Standing off a few feet he exclaimed, “My! What an exquisite thing this is! Who made it?” Without looking up from his book, Newton answered, “Nobody!” Quickly turning to Newton, the infidel said, “Evidently you did not understand my question. I asked who made this?” Looking up now, Newton solemnly assured him that nobody made it, but that the aggregation of matter [he] so much admired had just happened to assume the form it was in. But the astonished infidel replied with some heat, “You must think I am a fool! Of course somebody made it, and he is a genius, and I’d like to know who he is.”

Laying his book aside, Newton rose and laid a hand on his friend’s shoulder.

“This thing is but a puny imitation of a much grander system whose laws you know, and I am not able to convince you that this mere toy is without a designer and maker; yet you profess to believe that the great original from which the design is taken has come into being without either designer or maker! Now tell me by what sort of reasoning do you reach such an incongruous conclusion?”¹¹

In his **Mathematical Principles of Natural Philosophy**, Newton concluded (as Paley did later) that:

‘. . . it is not to be conceived that mere mechanical causes could give birth to so many regular motions . . . This most beautiful system of the sun, planets, and comets, could only proceed from the council and dominion of an intelligent and powerful Being. And if the fixed stars are the centers of other like systems, these, being formed by the likewise council, must be all subject to the dominion of One; especially since the light of the fixed stars is of the same nature with the light of the sun . . . This Being governs all things, not as the Lord of the world, but as Lord over all; and on account of his dominion He is wont to be called Lord God . . . or universal ruler; for God is a Being eternal, infinite, absolutely perfect . . . It is allowed by all that the Supreme God exists necessarily . . .’¹²

One indication of Newton’s status in the scientific world is Isaac Asimov’s conclusion that most science historians would declare that Isaac Newton was the greatest scientific mind the world has ever seen.¹³ That the watchmaker argument is still powerful is reflected in the publication of tomes such as **The Blind Watchmaker**.

‘Paley drives his point home with beautiful and reverent descriptions of the dissected machinery of life, beginning with the human eye, a favourite example which Darwin was later to use and which will reappear throughout this book. Paley compares the eye with a designed instrument such as a telescope, and concludes that “there is precisely the same proof that the eye was made for vision, as there is that the telescope was made for assisting it.” The eye must have had a designer, just as the telescope had.’¹⁴

USE OF REASONING FROM EFFECT IN THE LEGAL SYSTEM

The law of cause is also critical both in the exact sciences such as physics and also in archaeology, history, and such fields as crime detection and even palaeontology. We often cannot locate (and thus cannot measure or evaluate) the **causer**, but we can examine what was **affected**, and from this interpolate the qualities of the **affecter**. In the field of palaeontology, much of what is known about ancient life was deduced from artifacts such as animal tracks, dung, eggs, bones or teeth. Tracks and skeletal structures are our main source of knowledge as to how fast dinosaurs walked (or ran), specifically how they walked, the shape of their feet, as well as the shape of many of their foot bones.¹⁵

The process of determining guilt in a court of law relies on the **assumption of cause** principle, requiring evidence, such as fingerprints, shoe tracks, clothing threads, or bullets. This type of evidence is not as good as the testimony of several reliable persons who directly observed the offender committing the crime, but is often conclusive enough to find the accused guilty. This same type of evidence is commonly utilized by creationists and the Scriptures to prove the existence of a Creator. For example, Psalm 19:1 in the **Good News Bible** says ‘How clearly the sky reveals God’s glory! How plainly it shows what He has done!’ Rejection of this view is the acceptance of functional atheism in that the term **creator** is synonymous with God.

The law of cause is generally carried to the so-called uncaused first cause. Thus, it is reasoned that if everything else requires a cause, then does not this first cause also need a cause and likewise this cause another cause — extending causal factors to infinity? This concern exists regardless of one’s world-view. Both theistic and non-theistic world-views face this same problem, and often both world-views solve it in the same way, namely, there exists an uncaused first cause which is not caused because it al-

ways existed. One system teaches that God always existed, and the materialistic naturalistic world-view likewise teaches the oscillating universe, that is, an infinite number of big bangs ‘explains’ where each big bang came from; they are simply the result of the collapse of the previous universe and the present universe will also expand to its limit, then will collapse upon itself — the big crunch — and again explode, producing another big bang. Thus, the question of where the primordial egg that produced the first big bang came from is answered either by assuming that the material universe always existed or spontaneously generated itself. Many philosophers and theologians have dealt with the uncaused first cause by concluding that the law of causality applies only to material reality. Thus, God is a spirit which does not obey this law, and although spirit events need not be caused, they can themselves cause physical events to occur, not unlike the law of potential and kinetic energy. Kinetic energy can come from either potential or kinetic energy, but potential energy can come **only** from kinetic energy in that potential energy is not a reality, but only a situation that can produce the reality of kinetic energy. Kinetic energy, on the other hand, can produce a situation in which there is a potential to produce energy, called potential energy.

Our lack of understanding of the spirit world, and our inability to reason on things which are not material, or at least concrete, limits us from speculating about any world other than the material world. We are limited to using analogies and experiences from the material world and extending these to our perceptions and theories about non-material reality.

THE NEED FOR BOTH A CAUSER AND A SUSTAINER

The watch and watchmaker illustration can be carried one step further. A watch is a mechanical instrument which is used primarily to channel a controlled amount of energy into the watch hand movement. A spring watch stores the energy which someone put there by winding the spring, and a battery watch uses the energy that results from the chemical reactions in the battery. Except for the value of its parts, or as an ornament, a watch’s purpose cannot be served without a continuous supply of energy: it is useless without the power to drive it. Energy is something beyond, and exists apart from, material objects, and can be revealed only through physical entities. Consequently, humans can study only the **effects** of energy on some material reality, not the energy itself. The human body can likewise be seen as a support network for what Genesis 2:7 calls ‘*the breath of life*’. This life force must be present in the body, and without it a human is a mere shell or corpse. One becomes a living person only when the breath of life is put into the body. Similarly, only when energy is directed into the mainspring does a watch become a working, functioning system, thus the need exists for a ‘causer’

for both events.

Beyond the realization that a watch requires a watchmaker is the fact that the machine must display a **high level of design** to serve its intended purpose. This design excludes even a small degree of randomness; for the watch to function, the **entire system** must operate as a unified whole. The malfunction of a single part often renders the entire watch inoperative. Fortunately, much greater flexibility is built into the human system; its over-design is to the degree that it can survive without many of its normal parts, such as one kidney or lung. The human system, although over-designed, is highly complex and dependent on every basic component for the system to function at its maximum level. In reference to this interdependence, Nobel laureate Szent-Györgyi stated:

‘. . . most biological reactions are chain reactions [which] . . . must fit together most precisely, as the cog-wheels of a Swiss watch do. But if this is so, then how can such a system develop at all? For if any one of the specific cog-wheels in these chains is changed, then the whole system must simply become inoperative. Saying that it can be improved by random mutation of one link [is] . . . like saying that you could improve a Swiss watch by dropping it and thus bending one of its wheels or axles. To get a better watch all the wheels must be changed simultaneously to make a good fit again.’¹⁶

LEARNING ABOUT THE CRAFTSMAN BY STUDYING HIS WORK

Only one step beyond the elementary reasoning that a creation requires a creator is the observation that a major avenue to learn about the creator’s person is to study his creation. The existence of a watch not only proves the existence of a watchmaker, but it also reveals a great deal about the watchmaker’s personal traits. As a study of art works reveals much about the artist, so too a study of both plant and animal life tells us much about their maker. As Szent-Györgyi observed, the creator

‘could not have been a molecular biologist only. He must [also] have known a great deal of quantum mechanics and mathematics, too, and must have been a good geneticist and physiologist. He must have been all that, and so if we want to follow his trail and read in the book of creation, we must be a bit of everything’.¹⁷

As an examination of music tells us much about the musician, likewise, an examination of the physical and biological worlds tells us a lot about the creator of these worlds. Reasoning along this line, Thompson concludes,

‘since the universe exhibits design, it must have had a Designer; since it exhibits intelligence, the Designer must have been intelligent; since it exhibits life, the Designer must have been living; since it exhibits morality, the Designer must have been moral’.¹⁸

THE LAW OF ORDER THAT IS KNOWABLE TO HUMANS

One of the most basic assumptions or axioms in science is that the ‘order’ that exists everywhere in the universe can be expressed as laws that always operate and are unchanging, giving total order everywhere. That ‘order’ is omnipresent must be assumed by all the sciences for research to discover ‘laws’ that can be relied upon. If gravity sometimes held and sometimes did not, the universe would be an incredibly insecure place and, in fact, could not exist except as space. Especially are the natural sciences, particularly physics and chemistry, based on this necessary assumption. Formulation of **Charles’ Law**, for example, is based on the assumption that stability and order exists in the physical world. If we find that, as we increase the temperature, a volume of a gas at constant pressure only **usually** varies directly with heat, the law is useless in predicting relationships.

Laws express occurrences that **always** operate with no known exceptions, only qualifications or specifications of conditions under which the law is true. The givens may add other qualifiers to the law, but do not negate it. These conditions also always follow according to law, controlling for variables, and each exception either **always** or **never** occurs. For example, objects in a vacuum always accelerate toward the earth at a rate of 9.81 metres per second per second. If an additional element is added such as air resistance, this added element would form another part of the law. Thus, air resistance adds a set of constants to the original law. The acceleration is then 9.81 metres per second per second, given no air resistance, or air resistance is corrected for.

The second assumption that science universally accepts is that **this order is knowable to humans**, and we are consequently able to abstract this order into laws. If we could not, there would be no point in doing scientific research. If one could not discover the law of gravity, there would be no purpose in trying. These two assumptions have been so successful that the sciences which are successful in controlling most or all variables, such as physics and chemistry, are called ‘exact’ sciences. This term is appropriate because humans are often able to measure and account for all relevant contingencies, given an awareness of all the important factors. Consequently, they can predict the results of an experiment with an extremely high degree of reliability.

The above two axioms of science cannot be unequivocally confirmed until every single example has been researched or tried. To fully demonstrate the law of gravity, it is necessary to release every single object that now exists, has ever existed, or will ever exist, within a given distance away from the earth to determine if the law always holds. Since this is obviously an impossibility, the science of statistics was developed which enables us to drop a certain number of objects (a sample) and general-

ize from the sample to the entire universe, or at least to the earth.¹⁹ This method has enabled us to test a limited number of examples, and generalize the results with a high degree of accuracy. The science of statistics is based on certain assumptions which experience has proven valid to a high degree. It is essentially a form of inductive reasoning, and has been with us as a formal system at least since Aristotle’s **posterior analytics**. The inductive method involves reasoning from a small set of confirmed facts to a general, broad conclusion, and thereby summarizing the cases observed. Problems with this method include the difficulty of generalizing from a small sample size: if it rained the last four times after I washed my car, I may conclude that washing my car **causes** the rain when the relationship actually resulted purely from chance. A major problem is locating or observing enough randomly selected cases to draw a valid conclusion, an area that the science of statistics can help us deal with.²⁰

Newton’s **first law of motion** which states that *‘a body will continue in its state of rest or uniform motion unless an unbalanced force acts upon it’* is an example of the most universally accepted axiom of science, namely, that **for everything that exists or occurs there exists a sufficient cause**. This axiom is the basis of the tremendous effort expended by scientists in trying to find the cause of everything from the common cold to cancer. From a purely philosophical viewpoint, **no reason exists for cancer to have any causes** and it is possible that humans may never find its cause or causes, but this view will not drive research. To solve problems, the scientific community must implicitly trust that the rule ‘for everything there is a cause’ will hold, and thus must be determined to find the cause for problems from colds to cancer. This belief has led to success so often that few question the axiom that a cause exists, and most all persons fully believe and act decisively on the conclusion that both a cause exists and it can be found. Even though ‘the cause’ of cancer has so far remained largely elusive in spite of some of the best minds working for decades, few question the assumption that a cause exists.

A major **reason** a cause is searched for is because once it is understood, the cure or solution is often only one step away. Discovery of the cause is often much — or even most — of the battle. While it is difficult to prove absolutely this first axiom of science, it has been demonstrated so many countless times that it is implicitly assumed to be true. When humans have looked for a cause, they have found it so often that we assume that a cause exists for **all** events. And statistical sampling probably renders this statement at a confidence level so high that the alpha level exceeds 0.000000001.

Once causes are understood, uniform consistency of the cause is universally accepted. This consistency implies the question: **‘Why** does consistency exist?’ meaning what causes the consistency? Although no apparent ‘reason’ exists for the order found, that is, there is no ‘rea-

son' for gravity to always operate, the fact that it does is not a **reason**, but only a description of what occurs. Scientists know only that 'laws exist', not **why** they do. Laws are an attempt by humans to abstract what we find exists in the universe.

The behavioural sciences are likewise endeavouring to apply these two axioms to their domain: behaviour is lawful and this order is knowable to humans, and if one knows **all** the relevant contingencies, the resultant behaviour will be fully predictable.²¹ People behave the way they do for a reason, and this assumption has underlined both psychology since its inception in the 1800s, and also our view of ourselves throughout history. We may no longer always accept the reasons people once offered for certain behaviours (such as 'spirits made me do it'), but we have throughout history proposed, or at least looked for, a **reason** behind all behaviour. When someone does something we do not readily understand, the implicit assumption that a reason exists causes us to respond with, '**Why** did you do that?' The major problem with predicting human behaviour is that a large number of contingencies exist, many of which are difficult to delineate and some are probably unknowable, at least in retrospect. Extensive study has allowed the behavioural sciences to formulate laws, some of which have a fairly high degree of predictability, especially those dealing with animal or human behaviour in situations in which most of the important variables can be controlled.

The conclusion that all behaviour is caused is reflected in Proverbs 22:6 which states: '*bring up a boy according to the way for him, and even when he grows old, he will not depart from it.*' Some translate this passage as '*bring up a boy right, and even when he grows old, he will not deviate from this behaviour pattern.*' Adults exist who are concerned citizens, work hard, are respected in their community, etc. We commonly reason backwards and say they are such because of 'good upbringing'. This is not to dispute the existence of free will, only to say that when behaviour is examined, we look for a set of causes, including in the role parents played, the influence of others, or our own internal motivations. All of these different causes often have some influence on the child's upbringing, but all are still causes.

The existence of laws implies a lawgiver or someone or something to **cause** or produce the conditions which caused the laws to come into reality. For a law (a non-tangible, non-physical, or metaphysical reality) to exist, physical realities must logically exist. The material universe could not exist without the order which is summarized in statements called laws or rules that are able to predict events successfully. In Jastrow's words:

'The Universe, and everything that has happened in it since the beginning of time, are a grand effect without a known cause. An effect without a cause? That is not the world of science; it is a world of witchcraft, of wild events and the whims of demons, a

*medieval world that science has tried to banish. As scientists, what are we to make of this picture? I do not know. I would only like to present the evidence for the statement that the Universe, and man himself, originated in a moment when time began.'*²²

THE HUMAN TENDENCY TO LOOK FOR CAUSES

The theory that humans have a built in 'drive to know' similar to a hunger or sex drive has been empirically supported by many studies, and has been hypothesized at least from the time of Aristotle. The very fact that all past societies sought an explanation, and had **some** type of explanation for almost all physical events which repeat themselves with some regularity, supports both the contention that we have an innate need to know the **cause** of events we see occurring around us, and the supposition that we instinctively recognise that all events have a cause.

The innate perception that all events have a cause is common not only throughout history and among all cultures, but also among very young children. Among the first words that a child learns is 'why', and this word, as any parent knows, is generously exercised during much of the child's early years, supporting the contention that the need to comprehend a cause for all that exists is partly innate.

It is at times maintained by some that certain types or classes of events occur without a cause. Certain forces which control the atom and cause the decay of radioactive elements, some quantum physicists conclude, do not have a cause but just 'occur'. Many past events have been reputed to be 'without cause', often ascribed to 'the nature of things', but further research has always found a very specific cause. As this has so often been the case in the past, it seems inevitable that a cause will be found for all events occurring today in which a cause is presently unknown. It is one thing to note that a cause is not known, and quite another to prove that one does not exist. Even if one is never found, this does not demonstrate that a cause does not exist. The basic verified axioms of science all but rule out the possibility that normal events occur without causes. Because of sensory and other limitations, we may not be able to delineate the cause, but the most that we can conclude is a cause is as yet unknown, not that one does not exist. Mathematicians, logicians, philosophers and others have discussed, researched and debated the difficulty in demonstrating that a specific effect is the result of a certain cause, but rarely have they questioned the axiom that a cause exists for every given effect.

This concept of the necessity of a cause is so much a part of our thinking that it is difficult for us to perceive reality without postulating a cause.²³ We cannot even conceive of a situation without a cause, although this may be due to the limitations of the human mind. This is true whether God or natural explanations are given to explain

something such as the existence of the universe. Whether its existence is explained by the Big Bang or the Oscillation theory, we still must ask what caused the Big Bang or the Oscillation events, and where did the original 'primordial egg' come from? Understanding a law is facilitated by knowing what caused the law. That laws 'just exist' or 'have always existed' does not answer this question.

Noting that natural forces cause the physical and chemical laws raises the question, what causes these natural forces? If the explanation is given, for example, that a tremendous explosion in the earliest universe produced them, we must then hypothesize yet another cause for the 'big bang' hypothesis. The answer that 'natural forces' caused the 'big bang' avoids the answer by using a meaningless label. Thus, whether we rely on theological or naturalistic explanations, we are still faced with the same difficulty. For this reason, the question 'who created God', likewise also exists with the naturalistic explanations of the universe, and carries the same weight in criticizing the concept of God as it does in criticizing any other explanation of the universe. Whatever explanation for the existence of the universe one accepts, it can always be challenged with the question what caused the precursor step and then what in turn caused that step? In Paley's words:

*'Nor is any thing gained by running the difficulty further back, i.e., by supposing the watch before us to have been produced from another watch, that from a former, and so on indefinitely. Our going back ever so far, brings us no nearer to the least degree of satisfaction upon the subject. Contrivance is still unaccounted for. We still want a contriver. A designing mind is neither supplied by this supposition, nor dispensed with. If the difficulty were diminished, the further we went back, by going back indefinitely we might exhaust it [but it is not diminished, thus things going backward does not solve the origins problem].'*²⁴

The impasse is broken only by the uncaused first cause which theists have answered with an eternally existing God.

THE LAW OF CAUSE AND THE EXISTENCE OF LIFE

The theory of spontaneous generation — believed for centuries — essentially taught that life was generated from some natural and normal process, although it was generally believed that only some animals, primarily insects, could spontaneously generate. Limited spontaneous generation was accepted by such notable figures of history as Plato, Socrates, Epicurus, Democritus, Harvey, Thales, Newton, Goethe, Copernicus, Galileo, Bacon, Hegel and Schelling, even though most of these men were in some sense creationists. It was, for example, believed that geese spontaneously generated from barnacles, mice from dirty undergarments, bees from dead calves, fruit flies from banana peels, and maggots from manure. These common

observations were logical conclusions from the data available during most of biological history. Fruit left by itself in a day or so invariably yields **fruit flies** (called such initially because of the belief that these insects came from fruit). But looking beyond the surface, scientists found the common sense conclusion of spontaneous generation was not valid, upholding the law that for every event there was an adequate cause.

Redi, Spallanzani and Pasteur are well known for their various experiments that proved the validity of the cause hypothesis of life: they put meat heated to kill the germs on it in two jars, and then sealed one jar which contained meat so that fresh air could not get at it. As expected, the organic matter exposed to the air seemingly generated life, but the sealed meat did not. After others repeated these and similar experiments, the theory of spontaneous generation was in time discredited.

Those who do not believe in a creator conclude life originated through spontaneous generation under conditions that **no longer exist today**. Spontaneous generation is not possible **today**, but **was** in the past, they reason, because *'it must have happened as life is here, and science cannot appeal to a non-naturalistic view.'* To make the theory of spontaneous generation more palatable, it was believed that life did not spontaneously generate from 'nothing', nor did inanimate matter change into fully developed creatures such as flies. Rather, life spontaneously generated from amino acids that slowly changed into very simple life forms, and eventually, with more eons, into bacteria and, after many more eons, evolved into humans. To say this happened suddenly is absurd, but it becomes reasonable to some persons if it is stretched out over an incredibly long lapse of time. The cause problem though still exists, and is often not helped by adding the time factor.

Time, even eons of time, added to an improbable event does not cause it to become probable. Time increases the chances of rare events happening, but does **not** increase significantly the probability of highly improbable events occurring, because the universe is now thought to be both finite and limited, and therefore the time span is far too short and its size far too small. Only 10^{80} nucleons and electrons are currently estimated to exist, far too few to explain much by naturalism. Thus, naturalistic evolutionists today in actuality accept a **form** of miraculous spontaneous generation.

THE NEED FOR ADEQUATE CAUSES

Further, when cause is evaluated, one other aspect must be considered. Every effect not only must have a cause, but an **adequate** cause.²⁵ In Thompson's words,

'The river did not turn muddy because the frog jumped in; the book did not fall from the table because the fly lighted on it; these are not adequate causes. Whatever effects we observed, we must pos-

*tulate adequate causes.*²⁶

SUMMARY

The existence of a creation requires a creator or some means of bringing the creation into existence. If something happened, adequate causal factors must exist to cause it to occur. What accounts for the existence of the creation is the subject matter of the science field called **origins** or **cosmogony**. Research into origins relegates itself to two views, creation by a creator or a creation by some means of spontaneous generation — a creation without a creator. One who accepts the creation hypothesis realises that many gaps exist in the theory, but this is not unlike the naturalistic evolution view which also has many ‘missing links’ yet concludes the evidence is good enough and faith can fill in the missing links until they are found. All origins beliefs are based on probabilities, and acknowledging this helps us work from low to a higher probability level, a road all researchers must travel to find answers, and one which requires filling gaps in knowledge no matter what branch we select.

REFERENCES

1. Thompson, B., 1990. The Bible and the laws of science: the law of cause and effect. **Reason and Revelation**, 1(3):13.
2. Sprague, E., 1967. William Paley. In: **The Encyclopedia of Philosophy**, Collier MacMillan Co., New York, Vol. 6, pp. 19–20.
3. Paley, W., 1839. **Paley's Natural Theology**, Harper and Brothers (in two volumes), New York, p. 50.
4. Paley, Ref. 3, p. 50.
5. Clark, R. W., 1984. **The Survival of Charles Darwin; A Biography of a Man and an Idea**, Random House, New York, pp. 12–13.
6. Darwin, F. (ed.), 1958. **The Autobiography of Charles Darwin and Selected Letters**, Dover Publications, Inc., New York, p. 19.
7. Osborn, H. F., 1925. **The Earth Speaks to Bryan**, Scribners, New York, New York, pp. 64–65.
8. Osborn, Ref. 7, p. 65.
9. Dawkins, R., 1986. **The Blind Watchmaker**, W. W. Norton Co., New York, pp. xi–xii.
10. Wysong, R. L., 1976. **The Creation-Evolution Controversy**, Inquiry Press, East Lansing, Michigan, p. 180.
11. Newton, I., 1957. Who made it? **The Minnesota Technologist**, 38(1):11.
12. Newton, I., 1952. Mathematical principles of natural philosophy. In: **Great Books of the Western World**, Encyclopedia Britannica, Inc., Vol. 34, Chicago, p. 269.
13. Asimov, I., 1964. **Asimov's Biographical Encyclopedia of Science and Technology**, Doubleday and Company, Garden City.
14. Dawkins, Ref. 9, p. 5.
15. Bakker, R., 1986. **The Dinosaur Heresies**, William Morrow and Company, New York.
16. Szent-Györgyi, A., 1977. Drive in living matter to perfect itself. **Synthesis**, 1(1):18.
17. Szent-Györgyi, Ref. 16, p. 17.
18. Thompson, Ref. 1, p. 15.
19. Bergman, J., 1981. **Understanding Educational Tests and Measurements**, Houghton Mifflin Company, Boston.
20. Bergman, Ref. 19.
21. Skinner, B. F., 1974. **About Behaviorism**, Alfred A. Knopf, New York.
22. Jastrow, R., 1977. **Until the Sun Dies**, W. W. Norton Co., New York.
23. Achinstein, P., 1983. **The Nature of Explanation**, Oxford University Press, New York.
24. Paley, Ref. 3, p. 56.
25. Achinstein, Ref. 22.
26. Thompson, Ref. 1, p. 14.

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