Rev. Paley Finds a Watch: A Poorly Designed Argument for Design

Gary Hill

Teleological arguments for the existence of a god have a very long history. Socrates (384BC - 322BC) argued, for example, that the perfect fit of the eyeball within the eyesocket was likely due to it's having been designed so. Cicero (106BC – 43BC) later argued in 'De Natura Deorum' that,

"When you see a sundial or a water-clock, you see that it tells the time by design and not by chance. How then can you imagine that the universe as a whole is devoid of purpose and intelligence, when it embraces everything, including these artifacts themselves and their artificers?".

Thus began a procession of teleological arguments using timepieces as the object of analogy. About eighteen centuries after Cicero, Voltaire remarked:

"I'm puzzled by the world; I cannot dream the timepiece real, its maker but a dream".

Although the watchmaker analogy was ascribed first to Bernard le Bovier de Fontenelle in 1686, by far the best known version is that of William Paley in his work 'Natural Theology, or Evidences of the Existence and Attributes of the Deity collected from the Appearances of Nature', first published in 1802. The work argued strongly for a 'natural theology' i.e., that the best evidence for God was available from the study of nature and natural processes, rather than the study of alleged miracles. The relevant extract is:

"In crossing a heath, suppose I pitched my foot against a stone, and were asked how the stone came to be there; I might possibly answer, that, for anything I knew to the contrary, it had lain there forever: nor would it perhaps be very easy to show the absurdity of this answer. 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 of the answer I had before given, that for anything I knew, the watch might have always been there. There must have existed, at some time, and at some place or other, an artificer or artificers, who formed the watch for the purpose which we find it actually to answer; who comprehended its construction, and designed its use. Every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference, on the side of nature, of being greater or more, and that in a degree which exceeds all computation"

Ironically, the same year saw a book on geology, 'Illustrations Of The Huttonian Theory', written by the Scottish scientist and mathematician John Playfair, which argued the opposite to Paley; that the observed natural world was in constant flux and the changes resulted solely from natural processes without recourse to any deity.

At the time of writing, Paley held a number of middle-ranking positions within the Church of England including the Archdeacon of Carlisle, Rector of Bishopwearmouth and subdean of Lincoln Cathedral. He had developed a formidable reputation not only in the field of Christian apologetics but for what would today be recognised as holding decidedly left-wing views including graduated income tax, the moral right of the poor to steal food when hungry and the right of a woman to have her own career and to own property independent of her husband. The latter point held to despite inheriting a large sum of money from his wife's business owning father. Such views did little to endear him to the upper echelons of the church nor to King George III who referred to him as 'Pigeon Paley'.

Paley's argument certainly has a simplistic sense of veracity. Some then and many more now, however, are unconvinced of his argument. Probably the fundamental flaw in Paley's reasoning is Paley himself, who could not have been walking along with an objective mind as to the origin of the world and all within it. In 1802 belief that the world was created by God was a given, most certainly for a clergyman. When Paley took his stroll he would have been observing a 'creation' and nothing else. Everything within his sight had been deemed a-priori to have been created. He knew nothing else. How then would he ever have been able to distinguish between a 'designed' object and an 'undesigned' object?

Imagine, for example, that we live in a world that was entirely composed of red or various shades of red. If we suddenly encountered a blue object we should be able to characterise it immediately by a difference in colour as it would contrast with the surrounding environment. Yet Paley argued that no such contrast is apparent; if we are able to detect design in a found watch we should feel confident at similarly detecting design in the world surrounding the watch. This shortcoming is magnified by the fact that Paley had foreknowledge of watches, their purpose, and perhaps some learning as to how they are manufactured and operate. This would surely have made him susceptible to perceive design in the watch, even in the unlikely event he had hitherto been experiencing an absence of perceived design in the surrounding world. Humans tend to anthropomorphise and teleologise all too easily. Paley would certainly have been aware of such doubts. The philosopher David Hume, in 'Dialogues Concerning Natural Religion', published twenty-three years before Paley's work, had argued that creation of a man-made object differs from a natural object in a very important way; it can actually witnessed as it occurs whereas the design and/or creation of the universe can only be supposed. Furthermore, we can often conclude a great deal about the characteristics and intentions of the designer of a man-made object whereas we can conclude very little about the characteristics and intentions of a natural designer.

In Chapter 15 of his book Paley draws an inference of design from the fact that our eyes point in the same direction as our feet, deducing that this is so we can see where we are going. This is a surprisingly simplistic analysis for a student of natural history to make. It would surely not have been difficult for him to observe that a horse's eyes face sideways to their preferred direction of travel. The more important point made by Paley however was this using this example as an argument against the forward situation of the eyes having occurred by chance. He reasoned that, given the eyes could theoretically face approximately forward backward or sideways, there was a probability of one in four that the forward direction would have occurred by chance. Ergo, the probability was that we were designed. However, Paley was wrong even then to evaluate his hypothesis of design as being in opposition only to blind chance. It needed to be evaluated against competing hypotheses. We now know, of course, that evolution by natural selection is not a uniformly chance process. And even watches are subject to a process of man-made evolution.

It is only fair to mention, too, that much opposition to Paley's ideas of natural theology has come from within Christianity itself. The problem has always been that nowhere in the Bible is there any exhortation to belief in God via natural theology, making Paley's views seem unbiblical. Because of it's lack of basis in scripture natural theology has been accused of leading too easily to the conclusion that God in fact did exist, but without any complementary central role for Jesus. In his 'Pensees', published shortly after his death in 1662, the philosopher Blaise Pascal had this to say of a work based on natural theology:

"*In a treatise addressed to infidels they begin with a chapter proving the existence of God from the works of nature.....this only gives their readers grounds for thinking that the proofs of our religion are very weak.....It is a remarkable fact that no canonical writer has ever used Nature to prove God.*"

The influential Anglican Priest turned Catholic Cardinal, John Henry Newman was particularly scathing of Paley's influence on theology, arguing in 'The Idea of a University' in 1852 that notions of God attained from natural theology are:

".....not very different from the god of the pantheist.....his profession of theology deceives others [and] perhaps deceives himself."

And exactly twenty years later:

"*I have not insisted on the argument from design.....To tell the truth, though I should not wish to preach on the subject, for 40 years I have been unable to see the logical force of the argument myself. I believe in design because I believe in God; not in a God because I see design.*"

The noted Swiss theologian Karl Barth did not mince his words either. In response to Emil Brunner's 1934 treatise on natural theology 'Nature and Grace', he famously wrote a rebuttal paper with the single word title "*Nein*!" (no). In contrast modern theologian Alister McGrath sees natural theology as able to strengthen existing belief. In his work 'The Open Secret: A New Vision for natural Theology' (2008) he states:

"*A Christian understanding of nature is the intellectual pre-requisite for a natural theology which discloses the Christian God.*"

By a "*Christian understanding of nature*", McGrath does not mean an up-to-date appreciation of research in the life and earth sciences. Such a thing generally leads to a lack of perceived design. He simply means an a-priori assumption that design is inherent in the universe, regardless of any evidence to the contrary. This is unconvincing. Substitute his use of the word 'Christian' with Islamic and Muslim, or any other combination of religion and deity, and his argument remains essentially unchanged. McGrath-style reasoning risks far-fetched analyses of perceived design in nature such as William Prout's delightful 1834 eclectic opus, 'Chemistry, Metereology and the Function of Digestion: Considered with Reference to Natural Theology'.

However, while possessing knowledge of watches and/or Christianity might well have predisposed Paley to perceive design in the manufactured and natural world the converse, i.e., a lack of knowledge, arguably enables a susceptibility to erroneously perceive design in the natural world. Much psychological research demonstrates that human beings are notoriously poor judges of probability and this, along with our naturally strong ability for pattern detection and agency detection, predicts it will be commonplace for humans to infer design where none exists. In her paper 'The Design Debate', published in the journal 'Christianity Today' in 1998, Christian biologist Rebecca Flietstra gives the following example: Imagine you are walking through a forest early one morning and come across a perfect circle of toadstools that had not been there the previous evening. Because their appearance at that location, at that time could not be predicted, was sudden, and near-perfectly symmetrical it may appear to have resulted from some intelligent, purposeful activity. This is just what pre-scientific people thought and so attributed various myths to the pattern, such as the existence of 'fairy circles' (circular rings of fungus, particularly *Marasmius oreades,* which can be as large as 200m in diameter). Now we have a good knowledge of the life-cycle of fungi, we know that 'fairy circles' result from a central organism sending out threadlike mycelia underground in a radial pattern. When moisture levels and temperature are favourable and two mycelia meet, they form a toadstool. Sometimes several form a near-perfect circular pattern. No designer is necessary, the process is entirely natural. Another example might be the observation that a population of squirrels regularly used the overhanging branches of trees growing on opposite banks of a creek to cross the waterway. A naive view, then, might be that the trees were purposefully placed in their locations to aid the squirrels. Examples of apparent design in the animal world would also include the 7 metre high mounds with complex internal scaffolding built by the termite species *Nasutitermes triodiae* or the intricate songs of birds such as the great reed warbler, *Acrocephalus arundinaceus* and woodlark, *Lullula arborea*.

Unlike claims of design in man-made objects, any claim to the universe itself having been designed can only ever be made as an a-posteriori argument in the form of a hypothesis. Claims of a designer cannot be made with reference to evidence of an intrinsic nature, despite the wide acceptance of this view in many theistic belief systems. As a generated hypothesis a design claim can only be accepted by evidence derived from experience and investigation. In other words, the question is clearly within the remit of science. Some theologians, of course, object to this stance on the grounds that a scientific epistemology, dealing as it does with natural phenomena, has no place investigating non-physical aspects of the universe. Richard Dawkins, for one, summarily dismisses this attitude by rightly noting that theologians were in effect

"defining themselves into an epistemological safe zone where rational argument could not reach them because they had declared by fiat that it could not".

This point will be addressed in more detail later.

As natural explanations for phenomena have consistently replaced previous supernatural explanations, with no reverse findings at all, it would reasonably seem unlikely, though not impossible, to expect science to provide any evidence for supernatural design.

This one-way direction of understanding is particularly well exemplified by the phenomenon of lightning. For thousands of years lightening was believed to have a supernatural causation and anthropologists have counted 48 separate gods worldwide who have been claimed as uniquely responsible. Think Zeus or Thor. Not one of those gods, nor the supernatural mechanisms they are supposed to have deployed, are considered valid today by any more than a handful of people and even then more as poetic analogy than literal causation. Nevertheless, supernatural explanations for other natural phenomena are still frequently posited in non-scientific quarters. They are, however, invariably either outright supposition or characterised by poor or unscientific methodology with a distinct lack of replicability.

Conversely, a prominent criticism of scientific methodology by theists is that science (partly due perhaps to it's successes), considers only a finding of natural causation thus blinding itself to the possibility of design as a causal mechanism. This is not true. The primary goal of science is to make observations that are objective, reliable and as verifiable as possible. Scientific methodology is not employed merely to seek out natural causes; indeed it is regularly employed to detect design in, for example, the SETI project to detect intelligent life. Indeed, the first detection of what we now know to be pulsars by Jocelyn Bell in 1967 and emanating from the Crab Nebula was initially hypothesised to have intelligent causation. The series of pulses, each lasting 1.337 seconds and tracked for 30 consecutive minutes, was actually labelled LGM-1, for 'little green men'. We now know, of course, that pulsars emanate from spinning neutron stars and have a natural origin. In addition to astronomy, forensics and archaeology are other scientific fields which routinely search for evidence of design. The fact that natural causes are consistently found in fundamental fields such as chemistry, biology and physics is far more a consequence of the data itself than the attitude in which the data is approached. We should not forget that design hypotheses, as briefly outlined, have a far longer history than empirical findings suggesting natural causation. They should have had ample time to yield convincing results, yet have not. They are also more numerous with advocates of design tending toward a plethora of culturally specific theistic worldviews, any one of which could have provided evidence for design. In contrast, findings pointing to natural causation, for example in medicine, can be applied across cultures, testament to their grounding as explanatory principles.

Because advocates of design have produced little, if anything, in the way of empirical evidence, the majority of claims for design can further be labeled '*argumentum ad ignorantium'* or an 'argument from ignorance'. For the majority of theists, the strongest evidence for design by an agent outside the universe rests on a sense of personal faith and the strong perception of an absence of evidence to the contrary. However, as Carl Sagan rightly puts it *"your inability to invalidate my hypothesis is not at all the same thing as proving it true."* Even the ardent advocate of design, the biochemist Michael Behe concedes the point: *"The peril of negative arguments is that they may rest on our lack of knowledge, rather than on positive results"*. It is notoriously difficult if not impossible to prove a negative (think Bertrand Russell's celestial teapot) and, given present knowledge, science does not yet have the tools to definitively establish the existence or non-existence of a supernatural god. It does not follow, however, that science necessarily take an agnostic attitude. As previously mentioned, natural explanations have superceded supernatural explanations with quite remarkable regularity and we have no reason at all to believe this pattern of findings will not continue. Thus, it is perfectly reasonable to assume that any subject under investigation, including the existence or not of a designer, is more likely to be concluded with evidence of a natural causation. A good degree of probability can be said to exist. Given the strength of this probability, holding an agnostic attitude (in the lay sense of the term 'agnostic') to the existence or not of a designer can be argued to be akin to a *reductio ad absurdum* as it surely becomes equally reasonable to hold perpetual agnostic views on any matter, regardless of the quality of the evidence that has been gathered previously. This is obviously absurd.

Furthermore, because the design hypothesis invokes a supernatural causation it is not amenable to making specific predictions that can be tested. So what might comprise sufficient evidence for design? In the absence of clearly specified contrasting 'designed' and 'not-designed' universes by which to make a comparison, criteria for evidence of design does not come easy. Paley attempted to confine the requirements to two observations derived from the watch. First, there is an acknowledged purpose to a watch, therefore evidence of purpose is necessary to make a claim of design. Second, functional complexity would need to be maintained. If the watch did not contain all it's parts, or if the parts where arranged in some other way, function would be lost. From this Paley argued that the world, like the watch, possesses both a purpose and an even greater degree of functional complexity and so shows evidence of having been designed.

These must have seemed compelling arguments to many people in the nineteenth century. Indeed while studying theology at Christ's College, Cambridge, the young Charles Darwin, a then believer in the literal truth of the Bible, is reported to have been *"delighted at the language and logic"* of Paley's arguments (coincidentally Darwin also occupied the same rooms as had Paley). On publication of his landmark book 'On the Origin of Species by Means of Natural Selection' in 1859, Darwin chose to

deliberately contrast his findings of ‘natural selection’ with Paley’s arguments from ‘natural theology’.

Nevertheless, the notion that because an object has an identified purpose it must have been designed is patently erroneous. Manufactured objects such as watches do have an obvious purpose. Yet when viewed objectively in the absence of any religious teaching a complex object such as a plant, animal or even a human being has no obvious objective single purpose other than as a means of gene replication, perhaps. Constituent parts, such as limbs and organs do have an obvious purpose, however, and are more often multi-purpose components. Purpose is not an inherent factor in anything, it can simply be attributed to an object or component according to need or circumstance. A person’s arm, for example, might reasonably be considered to have the function of manipulating external objects, but where he to be swimming in the ocean, might provide the purpose of a source of nutrients for a shark. Similarly, a star simply occupies a particular place in the cosmos and emits photons, yet can be used for navigation by human beings. Is that its purpose? Some parts of living organisms appear to serve no purpose at all. Colourful flowers are known to attract bees and other pollen carrying organisms aiding in the procreation of the species, yet the dandelion despite having bright yellow flowers is entirely self-pollinating. Dandelion flowers thus appear to serve no useful purpose (though they did once; they used to reproduce sexually). Why go to the bother of designing something that has no purpose?

Similarly, findings from disparate fields of science have convincingly demonstrated that the mere appearance of complexity can no longer be considered as reliable evidence for design. A mundane example can be seen in snowflakes. Each snowflake has am assemblage of water molecules that is unique and, were we to consider the uniqueness of a single snowflake among all the snowflakes that have ever existed, the probability of that single snowflake actually existing would be beyond infinitesimal. Yet it exists. But no-one would reasonably suggest that it was the product of purposeful design. Considering a systems level analysis it is now widely recognised that within any system globally coherent patterns can be created by interaction between local elements without an external element imposing it through planning. Examples from physics would include spontaneous crystalisation and magnetisation. Examples from chemistry include molecular self-assembly and reaction-diffusion systems, while examples from biology include neuronal cooperativity, homeostasis, flocking behaviour and protein folding. Even the controversial Gaia hypothesis, operating on a planetary level, could be included in this list. Repeated and growing observations that order and complexity are inherent characteristics of matter act to diminish the explanory power of a designer. Continuing to affirm that complexity is always prima facie evidence of design is simply alluding to the ‘argument from incredulity’; the notion that if something is suitably complex it therefore cannot have a natural explanation.

Nevertheless, modern-day creationists in the guise of ‘intelligent design’ advocates have rehashed Paley’s expectation of ‘functional complexity’ in the form of the concept of ‘irreducible complexity’. Note that both ‘intelligent design’ and ‘irreducible complexity’ are notoriously poorly defined. Indeed, during the 2005 Kitzmiller et al vs. Dover School Board case which brought the first direct challenge in US Federal Court to the teaching of intelligent design in schools, biochemist and intelligent design proponent Michael Behe admitted during his testimony that should intelligent design be recognised as a science, astrology would also meet the same criteria. Behe further admitted that science would be unable to collect data regarding the character or intentions of the designer because the mind of God is intrinisically unfathomable. Statements of ineffability such as this do not offer any productive avenues of investigation. On the contrary, they are intended to immunise intelligent design from scientific inquiry. Unfortunately for Behe and intelligent design, attempts to immunise a phenomenon from investigation is widely recognised as one of the hallmarks of pseudoscience.

An irreducibly complex system is said to be one in which the removal of any single component prevents function and it has been claimed that the presence of irreducible complexity within organisms is a primary indication of design. There is no agreement, however, as to what level of organisation contains these individual components. Some intelligent design theorists such as Michael Behe accept that macroscopic structures may have evolved by natural selection but claim that some microscopic structures do demonstrate irreducible complexity. They cite as examples bacterial flagellum, protein transport and some immune system mechanisms, but all these examples have subsequentally been explained with regard to evolutionary processes. Many other intricate microscopic structures not cited by design advocates are also explained by natural selection and when this has not been achieved it may certainly be achievable in the future. In the absence of positive findings design postulations remain essentially a ‘god of the gaps’ argument. Indeed, the notion that we should observe irreducible complexity is not even a specific design hypothesis. Hermann Muller, a Nobel prizewinning geneticist predicted that irreducible complexity (or as he termed it, ‘interlocking complexity’) would be observed within evolutionary mechanisms as long ago as 1918. Since then, a large number of examples of evolved irreducible complexity have been observed with three distinct mechanisms identified at the microscopic level that can evolve a system characterised by irreducible complexity:

(i) ‘scaffolding’; in which additional components support a partially functional system over time until complete assembly has evolved. The additional components then become unnecessary and are pruned away by natural selection,
(ii) ‘improvement becomes necessity’; whereby a beneficial but unnecessary adaptation later becomes indispensable to the system and
(iii) ‘change of function’; in which a system which has evolved to fulfill a particular function becomes co-opted to perform a secondary function.

Ironically, when current knowledge of best practice in system design is considered, irreducible complexity is surely indicative of shortcomings in design. Critical applications such as homeostasis, for example, would never be knowingly designed to suffer catastrophic failure should a single component stop functioning. A competent designer would ensure that the system had built in redundancy and be robust. Human designed systems generally aim for design simplicity and/or elegance of function and are generally characterised as relatively robust when worked under pressure. For example, genomes are often likened to a language which codes information, yet most commercial human-created computer code is magnitudes more elegantly written than any genome discovered thus far. The only certain examples we have of designed systems and objects are those designed by humans yet the physical evidence for design offered by design advocates tends to be overly complex for actual function and inelegant by our own, allegedly inferior, design standards.

Such inelegance and faulty design characteristics are only to be expected in biological mechanisms that rely on continuous trial-and-error modifications of existing forms without teleological purpose or goals in mind. This standard of ‘design’ is characterised by more than simply the occasional random flaw or glitch. They are flaws that are explicable only if those organisms had evolved from ancestors that were morphologically and functionally different. As the biologist Jerry Coyne quips, “*if life was made by a god, it must have been a certain kind of god: one who designed creations to make us think that they had evolved*”. There are literally thousands upon thousands of examples of poor and even inadequate ‘design’ of living organisms on this planet ranging from the simplest bacteria to the largest mammals. Here are a few:

In the African locust, the wings are connected to the thorax yet the nerves that supply the wings originate in the abdomen and travel down the ventral nerve cord past the wings, where they then need to backtrack to the wings. No designer would sanction this grossly uneconomical arrangement of wiring. It most likely results from the abdominal nerves being co-opted for use in flight. Similarly, the recurrent laryngeal nerve in humans originates in the brain, travels down the chest then needs to retrace its steps upward to the throat. In adult giraffes the direct route for the laryngeal nerve is approximately 30cm, yet the nerve traverses nearly seven metres to reach the thorax. This due to our fish ancestors having no neck, so the original nerve looped around a gill arch that later evolved into the dorsal aorta in mammals. In human males, the urethra travels through the prostate gland. This gland is very prone to infection and, in later years, to enlargement. An enlarged prostate hinders the passage of urine through the urethra. What designer would place a collapsible tube carrying a liquid under pressure through a region that renders it liable to constriction and blockage? It would be far more efficient to shift the urethra just a few millimetres and have it travel around the prostate. There are also animals such as baleen whales, anteaters and cows which develop teeth as fetuses, then resorb them without ever using them. For what purpose?

One final example; nearly all mammals are able to manufacture Vitamin C in the liver due to the presence of the enzyme gulonolactone oxidase. Humans cannot and so need to source Vitamin C in the diet on a daily basis. The presence of gulonolactone oxidase is mediated by the GULO gene. Humans have the GULO gene, located at the same locus on the same chromosome as all other mammals but our copy is dysfunctional, a pseudogene. If a designer didn’t want us to have the enzyme why bother giving us the useless pseudogene? One design advocate response has been that a functioning GULO gene may have been part of the human design specification but has, for some as yet unknown reason, been silenced in the interim. If this is so it actually suggests that humans share a common ancestor with apes as they too carry the GULO pseudogene with the same damage.

Design advocate responses to examples of poor design characteristics are generally two-fold. They either claim that design shortcomings are intentional and therefore remain a sign of intelligence, or they simply deny that poor design characteristics actually exist. Explanations from the first group include the claim that we cannot know what the designer had in mind when he designed the world and may have even purposely included pain and suffering in his design, perhaps to teach us humility or patience or whatnot. Again, this is mere supposition, ‘a god of the gaps’ argument and in any case offers no explanation as to how inefficient wiring in the nervous system of the African locust might enable us to be better people. Another suggestion is that design shortcomings were intentionally included for ecological reasons in order that one species does not become too successful numerically. If this is so, then the logical conclusion is that the designer favours bacteria over more complex organisms.

The second approach, that of denial, is simply fanciful yet was one that Paley himself seems to have preferred. Attempting to infer inherent benevolence behind the creation, and ignoring, for example, rampant predation, he noted that even swarms of gnats and schools of shrimp appeared to be happy in their daily life! Paley's poetic view of life on earth, glorifying God's creation has, however, been expressed in far less eloquent terms. Consider this incredulous statement from one Rich Deem of the organisation 'Reasons to Believe', who claims to hold a masters degree in microbiology and to have published five first-author papers on immunology in "*prestigious scientific journals*". Here he discusses the poor design of the human oesophagus:

"So, here is what the evolutionists are proposing for a superior breathing apparatus. Our trachea would continue up to our nose, requiring our necks to be at least 1 inch wider. We would have huge noses with nose lips and a tongue protruding out. Of course, our faces would have to be much longer to accommodate the additional structures. Now, we would really be ugly! On second thought, it might be interesting trying to kiss with two sets of lips - nah, constantly expelling liquid out our nose would make it kind of gross. Aren't you glad you weren't designed by an evolutionist!"

The author of this passage is pathetically attempting to critique well-established scientific findings, not by furnishing data to support a contrary view but by appealing to his readers' aesthetic taste! Any doubts as to the author's scientific credentials can be confirmed by a PubMed search which returns no first author papers at all displaying the surname Deem and the initial R and no first author papers concerned with immunology authored by anyone with the surname Deem.

There is a widely held assumption that should widely accepted evidence of design be found in nature, theological claims with a Judeo-Christian pedigree would be vindicated. Nothing could be further from the truth, however. The data would, in all probability, tell us nothing about the designer. Indeed, it would not even logically follow that the designer was an omnipotent and omniscient god-like entity at all. There are several avenues of thought that lead us to this view. First, the natural world is overwhelmingly predatory at all levels of organisation. Viruses subvert cellular mechanisms in order to reproduce, killing the cells in the process; pathogenic bacteria battle to defeat immune systems; fireflies of one species emit flashes of light that mimic the mating signals of fireflies of a different species to lure them to their death; cheetahs outrun gazelles to feed on their flesh. The list goes on. If species are designed, they appear designed primarily to compete. Why would an omniscient, omnipotent and allegedly omnibenevolent designer create a world like this? Why would any single designer do this? It would seem as if the universe was designed as part of a gigantic cosmic game. To paraphrase Shakespeare in 'King Lear', *".....to the gods we are as flies to wanton boys"*. If we to accept the argument from design and follow it to its logical conclusion, we must consider the serious possibility that the natural world was designed by more than one designer, with at least some degree of malevolence, either working in unison or possibly competing with each other. The notion of plural, malevolent, competing creator gods is hardly new and certainly predates all Judeo-Christian theology. Second, even if evidence of design was discovered, and the designer was found to be anthromorphic as much Judeo-Christian tradition states, it would not necessarily be evidence of a god-like entity. The designer(s) could be time-limited, sentient beings like ourselves. The 'simulation hypothesis', devised by the Swedish philosopher Nick Bostrom and others, proposes that it is entirely possible, if not highly likely, that reality is a simulation and if so, we would be generally unaware of this. In support, Bostrom points out that the probability of at least one of the following statements being true is exceedingly high:

1. No civilisation will reach a level of technological maturity capable of producing simulated realities.
2. No civilisation reaching a level of technological maturity capable of creating simulated realities will actually do so. This may be for any number of reasons, e.g., computational processing power may be needed for other tasks, or people would would balk at the moral consequences of holding entities captive in simulated realities, etc.
3. We are almost certainly living in a simulation.

As Bostrom puts it *"In the dark forest of our current ignorance, it seems sensible to apportion one's credence roughly evenly between (1), (2), and (3)"*. Again, it would seem as if the universe was designed as part of a gigantic cosmic game. The simulation hypothesis is not inherently atheist and does not specifically address whether or not an ultimate god-like designer exists. Indeed, one criticism of the simulation hypothesis is any civilisation that has reached the level of technology required to run a simulation would likely have also reached a level of morality that prevent them from running a simulation in which sentient beings would inevitably suffer. In other words, they would not do what Paley's God appears to have done. It has also been pointed out that the simulation concept can be viewed as a 'reductio ad absurdum' in that were our civilisation to ever simulate a world it would in effect, be a simulation of a simulation. And so forth.

Nevertheless, the simulation hypothesis does suggest that while a god-like being is theoretically sufficient to create a universe, it does not follow that such a being is actually necessary to create a universe containing complex and diverse life-forms, some of which are sentient. Of course any civilisation running a simulation would be effectively gods in that they will have created a universe and would be both omniscient (in that they would have complete knowledge of all that occurs in the simulation) and omnipotent (in the sense that they would be able to suspend the physical laws of the simulated universe at will). However, as the Polish writer Stanislav Lem cleverly demonstrates in his short story 'Non Serviam' ('I Will Not Serve') it is doubtful that the 'personoids' in the simulation would feel any obligation toward their creator if the truth be known.

Interestingly, the notion that we are living in an illusional universe has been incorporated into Hindu and Buddhist teachings for many years. One branch of Hindu philosophy, Advaita Vedanta, teaches that the physical world and our conscious awareness results from a complex and powerful illusion known as ‘Maya’, which disguises a deeper reality, labelled ‘Brahma’. Buddhism contains the related concept of Bodhi, in which an enlightened human realises the true nature of the universe and no longer susceptible to the illusory physical world.

Third, even if evidence of a designer was detected, it would act to increase rather than decrease scientific curiosity. Would such a designer (capable not only of creating but perhaps long-term monitoring also) not be far more complex than the universe itself? Paley certainly thought so when he suggested the universe is *“that in a degree which exceeds all computation”*. Would it not also itself prove to be irreducibly complex? Would it not have needed to have been designed itself? ‘The Groucho Marx Effect’ coined by John Barrow, a Christian theoretical physicist comes to mind here:

"A universe simple enough to be understood is too simple to produce a mind capable of understanding it".