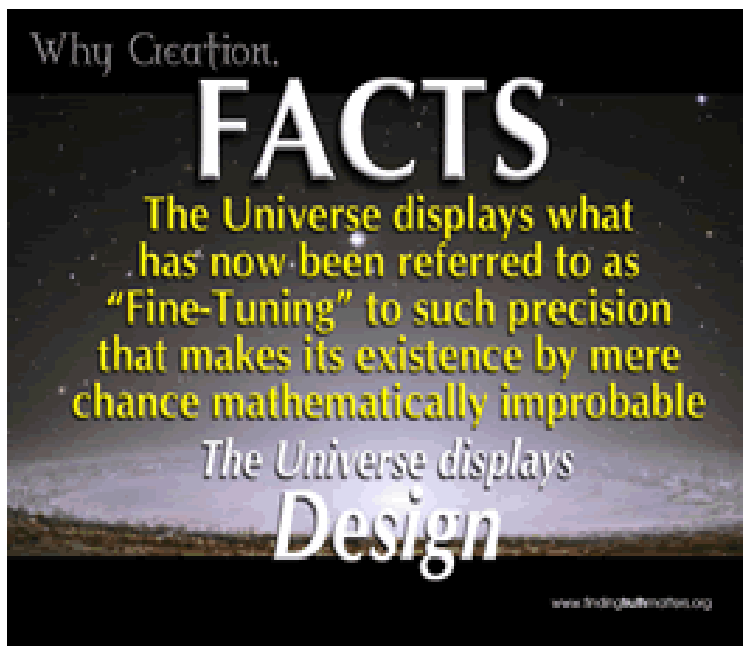


Our Intelligently Designed Universe

Dr Michael Jarvis

In our everyday human lives we encounter design all around us as we interact with things that people have made, whether paintings, houses, machines and many other things. We rightly assume that all these are the result of human minds designing them and then putting into action the mechanisms needed to produce the planned outcomes.

When we look at our universe and at the intricate complexities evident in living things, it is natural to ask whether these also point to the actions of intelligence and in particular to the mind of God as Creator.



Science is greatly expanding what the writer of Psalm 19 called the 'voice of God' speaking to us from creation. Science is revealing more of God's glory through revelations about the size of the universe and through discovery of some of the mechanisms he has used to bring about aspects of his creation.

Amongst many other revelations about our universe science has shown us that it has come into being as a result of finely tuned fundamental properties of matter and energy.

The 'fine-tuning' revealed to us by science is in fact **VERY FINE TUNING**.

To quote from an article on the Biologos.org webpage:

The fine-tuning of the universe is seen most clearly in the values of the constants of nature. There are many such constants, the best known of which specify the strength of the four forces of nature: the strong nuclear force, the weak nuclear force, the electromagnetic force and gravity. If these forces took on even slightly different strengths, the consequences for life would be devastating. Two of these forces in particular, the strong and electromagnetic forces, are responsible for the unusually efficient production of carbon, the element upon which all known life is based.

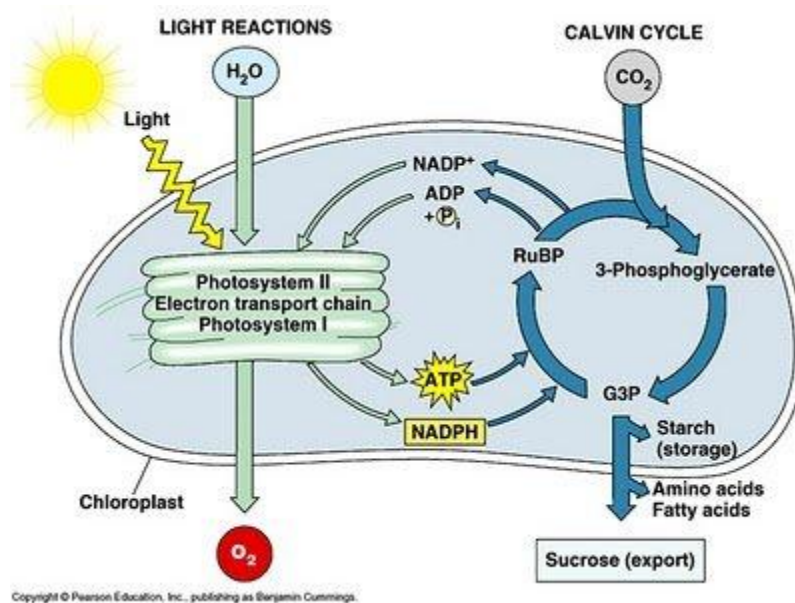
I am not going further into the details of this fine-tuning in this article. However, **for most people this fine-tuning tells to us that our universe is the result of the wisdom and power of the Creator**. In fact the only way of side-stepping this conclusion is to propose that our universe is just a lucky fluke within an infinite number of other possible universes. People with atheistic world views are at present putting their faith in this multiverse alternative, in spite of the fact that there is not any evidence for other universes, let alone the almost infinite number of such alternatives that would be needed if the statistical probability against chance is to be overcome.

Various physicists have attempted to calculate the statistical probability of our universe resulting from pure chance. Even on the more conservative side of these calculations we have those of Stephen Hawking. His calculations give us a probability against chance of about 1 in 10^{55} . This is equivalent to finding one unique coin in a mountain of coins covering the whole of the USA and stretching the 400,000 km to the moon!

How about design within life?

The more we discover about life in its enormous diversity the more we are amazed at the great number of examples of 'intricate complexity'. Furthermore, some of this complexity appeared on earth during the period when the only life forms were unicellular.

As one example, photosynthesis is the process whereby plants can use the energy from sunlight to absorb carbon dioxide and water from the environment and then create amino acids (basics of proteins), and starch and sucrose (for energy). As a by-product oxygen is released into the atmosphere.



Photosynthesis may sound a simple process but it has been described by some biologists as **possibly the most complex process known within life**. In fact there are still aspects of the process that are not fully understood. A complexity of chemical reactions is involved and the ability to move electrons from place to place within the systems. All of this complexity is enclosed within what is called a chloroplast.

It is amazing that **this great complexity appeared on earth during the first phase of life's history, before multi-cellular life was present**. This was vitally important because the early earth atmosphere contained very little oxygen. Photosynthesis slowly changed earth's atmosphere to an oxygen rich one suitable for higher life forms.

Irreducible complexities?

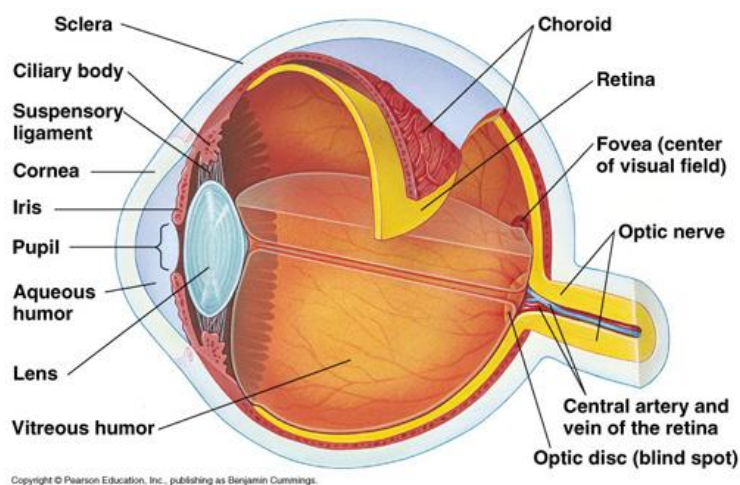
Scientific discovery is accelerating so fast that it is not wise to use examples of 'intricate complexity' or 'irreducible complexity' as suggested proofs for the existence of God. With relevance to so-called 'irreducible complexity', there are many biological structures and

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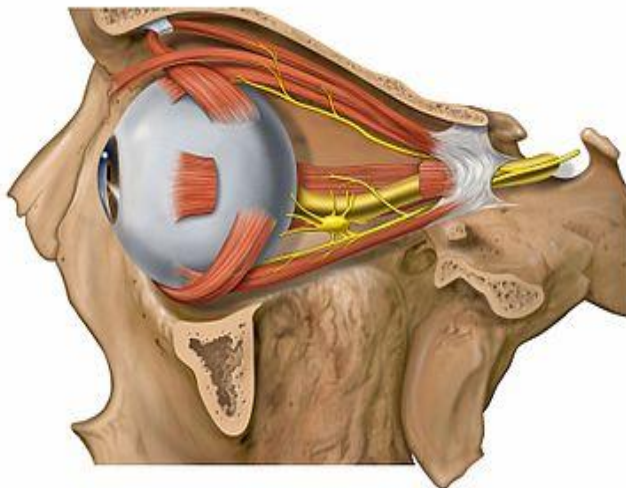
complex chemical processes that might initially seem to us to be non-functional until nearly fully formed, suggesting some special intervention by the Creator. However, scientific discoveries are starting to show possible stages leading to these complexities.

One example of intricate complexity is the human eye.

At one time Richard Dawkins claimed the human eye was an example of bad design because the light sensitive cells in the retina are placed back to front. However, subsequent research has shown that this arrangement actually produces better vision than if they were arranged as Dawkins suggested.



Whether a person believes in God or claims to be an atheist, we all have to admit that this structure is a marvel of functional design. Did God design it and bring it into being purely through the evolutionary mechanisms he ordained or were these mechanisms also in some way guided by him towards a pre-ordained outcome?



Another example of the intricate complexity in eyes is the musculature that enables our eyes to move in all directions. Especially note the muscle at the top. This passes through a cartilaginous 'pulley'! I suggest you also read my article 'Human eye poorly designed? And 'Human eye pulley system'. (Free downloads from my webpage).

The major parts of our eyes include:

Outer cornea: Protects the eye and acts as an important refractive medium.

Sclera: The tough white protective coat of the eye.

Conjunctiva: A mucous membrane extending from the eyelid margin to the corneal limbus.

Iris: A coloured circular membrane suspended behind the cornea and immediately in front of the lens. It regulates the amount of light entering the eye by adjusting size and pupil.

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Pupil: The opening at the centre of the iris. It contracts when exposed to strong light or when the focus is on a near object and it dilates when in the dark or when the focus is on a distant object.

Aqueous: Watery liquid that flows between the lens and the cornea and nourishes them.

Lens: The transparent tissue behind the Iris that bends light rays and focuses them on the retina. This is achieved by changing the curvature of the lens via an attached ciliary muscle. At short focal distances the ciliary muscle contracts, zonal fibres loosen and the lens thickens, resulting in a rounder shape and thus high refractive power. This enables the eye to focus thousands of times a day on objects at various distances.

Schlemm's canal: A passageway for the aqueous fluid to the eye.

Vitreous body: Transparent colourless mass of soft, gelatinous material that fills the centre of the eye behind the lens.

Retina: Light sensitive tissue at the back of the eye which transmits visual impulses via the optic nerve to the brain. It consists of millions of light sensitive cells specialised to react to specific wavelengths of light, enabling us to distinguish between even very slight differences in colour.

Macula: Pigmented central area or 'yellow spot' of the retina devoid of blood vessels. It is the most sensitive area of the retina and is responsible for fine or reading vision.

Choroid: Blood vessel-rich tissue behind the retina responsible for its nourishment.

Optic nerve: The nerve at the back of the eye that carries visual impulses from the retina to the brain.

Brain: The optic centre in the brain enables simultaneous integration of multiple impulses from the retina cells, to determine colour, movement, distance from objects and even if the objects are moving away or towards the eye.

Overall, the human eye has an average sensitivity to light that enables humans to exist in areas of subdued lighting and areas of intense light. If our eyes were only fractionally more sensitive to light people living at high altitudes or in snow covered places could suffer severe damage to their eyes.

The bacterial flagellum

Another example often referred to because of its complexity is the bacterial flagellum. This intricately complex organ propels bacteria through the medium in which they live. Until recently it seemed highly unlikely that biologists could trace functional stages in other life forms that could have evolved into the flagellum. However it is now known that parts of the flagellum structure are found in other organisms where they perform different functions. In other words it is not advisable to suggest that the flagellum could not have evolved via the mechanisms of evolution.

It is true that biologists still cannot trace all of the many intermediate stages that we might expect to see if the flagellum had evolved through known evolutionary processes. However, it is also unwise for believers in God to use these examples of complexity as evidence that the Creator made these complexities in ways that cannot be researched by science. Attempts to place God in areas of scientific ignorance has been likened to a 'God of the

gaps' theology. **When we emphasize gaps in scientific knowledge as evidence for God, we find that these 'gaps' become smaller as more information comes to light.**

The DNA genetic code of all life

The genetic blueprint for all life forms is encoded within the DNA that resides in every cell of the body. This is another example of intricate complexity that arose right at the dawn of life. In humans the amount of information encoded in our DNA has been compared to the amount of information stored in 200 telephone directories each 500 pages long! Even a single cell bacteria has thousands of parts (base pairs) in its DNA.

The complexity of this DNA code has led some people to propose it as an example of complexity that could not possibly have evolved. However, even this example of complexity may in time be explained through mechanisms built into the physics and chemistry of our universe by the Creator. This does not have to mean that development of the first DNA code was inevitable purely through the laws of chemistry and physics. From a theistic perspective God was involved in guiding the mechanisms he had put in place.

When Christians propose that the mechanisms are the only requirement leading to changes in life's complexity this borders on a concept of God that can be called 'deistic' rather than 'theistic'. A deistic understanding of God is basically that he planned the universe in great detail and inherent within the characteristics of the universe were all that was necessary to lead it to pre-ordained end-goals. I personally find this understanding to be in conflict with many examples in the Bible where God has impacted his creation in unique ways, such as when he became man, or in examples of the miracles of Jesus or how he impacts in personal details of our lives.

Evidence for Intelligent Design is certainly to be seen all around us

When I caution the wisdom of placing God in 'gaps', this in no way means that I do not believe that everything we see around us is the result of the wisdom, power and upholding presence of God. In other words I DO BELIEVE that this universe was intelligently designed. It is unfortunate that this reality has become associated with one approach to reconciling creation with God as originator. This 'Intelligent Design' movement sometimes tends to concentrate on the 'gaps' in knowledge, such as the examples of seemingly 'irreducible complexity'. As mentioned earlier I think this is unwise considering the continuing advance in scientific understanding, resulting in many 'gaps' becoming filled with mechanisms.

Why do I believe in intelligent design of the universe?

Basically for two main reasons:

1. As a Christian I accept the revelations of scriptures that tell us that, *In the beginning was the Word, and the Word was with God, and the Word was God. He was with God in the beginning. Through him all things were made; without him nothing was made*

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2. *that has been made.* (Bible: John1:1-3 NIV). Also, *For by him all things were created: things in heaven and on earth, visible and invisible, whether thrones or powers or rulers or authorities; **all things were created by him and for him.** He is before all things, and in him all things hold together* (Bible: Colossians 1:16-17 NIV). These and other Bible passages tell us that God is the originator and upholder of all things. In other words all of creation was planned by God and he determined that his plans came into existence according to his pre-ordained purposes. **Thus, I have to believe that all of creation was intelligently designed.**
3. The whole of scientific discovery points to intricate complexities that are essential for the existence of our universe and essential for existence of life on earth. These intricate complexities and the fact that we live in an ordered universe that can be described in terms of laws, speaks to me of the need for an overall planner and originator of it all.

The mechanisms being revealed by science

God has revealed himself to mankind as the Creator who has used mechanisms and processes as a fundamental part of how he has brought this universe and life into existence. His use of mechanisms is one of the realities that has been demonstrated through the discoveries of science.

The first verse in the Bible exclaims, *In the beginning God created the heavens and the earth.* However, the 'voice of God' speaking to us through scientific discoveries about God's universe, tell us that God created our universe through an evolving process. The initial Big Bang, with all its amazing fine-tuning, has led to an on-going process of universe expansion, formation of stars and galaxies, explosion of supernovae and other on-going evolutionary processes.

Science investigates mechanisms and processes.

The Bible tells us about origins and meanings and who is guiding the mechanisms and processes.

All the processes observed by science involve mechanisms governed by the laws of physics and chemistry and increasingly we are discovering involvement by the laws governing the microscopic quantum realities from which our visible universe is formed. The laws governing this quantum foundation of everything are still far from being fully understood. However, the characteristics of these mechanisms and processes were planned and initiated by the Creator right from the beginning of time and were pre-destined through the fine-tuning characteristics of the Big Bang creative event.

When we come to life and its increasing complexity over long time-scales, science is progressively revealing the intricate mechanisms involved in the ability of life forms to adapt to changes in the environment and their ability to diversify into different species.

However, even within scientific disciplines there is **debate as to whether mechanisms alone can predict all the outcomes.** There are many instances where mechanisms could lead to

various outcomes. In other words it is scientifically debatable whether all the resulting outcomes were the inevitable result of the laws and mechanisms involved in living systems. In addition, we know that other non-biological inputs have been involved in directing life towards its present diversity, for instance giant meteor strikes that were the probable cause of extinction of the dinosaurs, thus making the earth more suitable for mammals and for mankind.

Most scientists will admit that the theory of evolution still does not have a complete understanding of how life has increased in complexity over time. **New discoveries are leading to re-assessment of prevailing views on how evolution works**, for instance, the new understanding of 'epigenetics' and 'orphan genes'. I am not elaborating on these new discoveries other than to say that they are challenging previous understandings of how evolution works. In brief, '**epigenetics**' is the study of how changes taking place during the lifetime of an organism can have effects on expression of the genetic blueprint in the next generation and even for several generations. '**Orphan genes**' refer to the discovery that large numbers of genes (parts of the DNA genetic code that determine formation of specific proteins) in many life forms seem to have appeared suddenly in organisms, without a clear indication of where they originated or their evolutionary history.

These new discoveries do not mean that evolutionary mechanisms do not exist. It shows that science is in a process of discovery and this will in all probability necessitate some changes to the scientific understanding of how life has changed over time.

Where is God in the mechanisms he has created?

We may ask: Where is God in the mechanisms and processes that are progressively being discovered by scientific research?

Studies of the complex DNA code of life that is found in all living things, reveals that changes take place, some of which can lead to altered appearance of organisms. We call these changes mutations and from a scientific perspective it seems that these can take place in many different ways. By studying changes that have taken place scientists can link these mutations to the effects they have on the appearance or functioning of organisms. Scientists do not have the means of determining whether God has in any way guided which changes should take place. However, for those who accept that God not only initiated the universe but also upholds it and guides it towards his pre-ordained outcomes, we can **by faith** accept that he can and does in some way, at present known only to him, guide which mutations take place and which changes are retained by an organism.

For those of us who have experienced the reality of God interacting with our personal life situations, it is not hard to visualise that his universe-wide awareness and his independence from the limitations of time, enable him to be aware of and to interact with every detail of his universe. In this way we can visualise that he guides the outcomes of the mechanisms he has set in place, including the outcomes from mutations within living organisms.

A concept of God who is intimately involved in his universe, does not mean that he has created imperfect mechanisms. It can mean that he created the mechanisms in a way that enables him to guide them towards pre-ordained outcomes. If we suggest that he may apply the power of his mind (Word) into situations, whenever he knows that the mechanisms of evolution need to be directed in one way rather than another, this may remind us of the Bible passage referring to Jesus as God, *In the past God spoke to our forefathers through the prophets at many times and in various ways, but in these last days he has spoken to us by his Son, whom he appointed heir of all things, and through whom he made the universe. The Son is the radiance of God's glory and the exact representation of his being, **sustaining all things by his powerful word*** (Bible: Hebrews 1:1-3 NIV)



The discoveries from science are enabling us to visualise God as far greater than was possible in past generations. The mysteries revealed by science help emphasise that we cannot **'put God in a box'** and decide how he must be operating in his universe. He certainly uses the mechanisms he has ordained but the Bible tells us that he sometimes interacts with our universe in different ways, for instance, as demonstrated by Jesus through his miracles.

I personally believe that the intricate complexities we see all around us are best explained by a concept of God that visualises him guiding the mechanisms he has put in place towards achieving the intricate complexities that exist within life forms.

From a scientific perspective the 'finger of God' cannot be detected by any scientific instrument. The scientist simply notes that a mutation took place at one location on the DNA strand rather than on another location where it could just as easily have occurred. On the other hand those who have a theistic understanding of God (that he is intimately and continually involved in his creation) can simply marvel at the awesome outcomes of his guiding mind (Word). We will probably never know how he guides the mechanisms he has put in place but by faith we accept that he has and still does interact with his universe in minute detail.

Conclusions

I personally believe that the whole of creation was intelligently designed by God. I must resist the temptation to only put him into things I cannot understand. I also believe it is wrong to use specific cases of what may appear to be 'irreducible complexity' as my way of trying to prove the existence of God. The overall fine-tuning, intricate complexities and the 'law abiding' nature of the created order are our best evidence pointing to the need for God as creator.

Science investigates some of the mechanisms that God has used to bring about his creation. At the same time we must acknowledge the limitations of science. It does not have the means of researching whether or not there is the guiding mind of God that determines the final outcomes from these mechanisms. From a Christian perspective I can accept the ongoing and intimate involvement by the Creator in the mechanisms he has put in place in our universe.

Once we have by faith accepted the existence of God, reinforced through the revelation of himself through Jesus Christ and further reinforced through our personal relationship with God, then we can look at all of creation, including its numerous examples of intricate complexity and exclaim with conviction 'WHAT AN AWESOME CREATOR'!

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