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Adventures Await Everywhere!

One of the most delightful aspects of travel is the prospect of new adventures. And so it was, on a blustery and chilly day in late September, that we found ourselves driving along the southeast coast of Nova Scotia.

by Moxie

We were heading to Hawk Beach on Cape Sable Island, the most southerly tip of Nova Scotia. Such beaches are never easy to find, and we had to ask twice before we found it. After driving down very obscure roads, we found the beach after we had scrambled up quite a high embankment.

It was low tide. There before us the white sandy beach was littered with rocks, and farther out towards the water, an army of dark brown projections, each about 55 cm (18 inches) or more, tall, poked up from the shore. There were hundreds of them, and farther along the beach there were thousands more. This was one of the famous "drowned forests" of the Maritimes. Upon closer examination, we discovered that each of these objects was a tree trunk partially worn away by the sea. Many were about 25 cm (10 inches) or more in diameter. Many had long branched roots extending from the white sand or darkish sediment. The wood looked like real wood though some people say there are some petrified specimens.

Apparently at high tide this drowned forest lies under more than 3 metres of sea water. Yet the forest gives every indication of having grown where it now stands. Literature about the location suggests that the forest might be 1500 years old and that as the shore sank years ago, the sea invaded and took over the forest. Nobody really knows, of course.

Three thoughts race through our minds as we snap picture after picture of this remarkable scene. Firstly, these wooden stumps (probably of a conifer tree) have been worn down to such short objects as the sea with sand invaded their space. Secondly, of course, it was amazing how lengthy roots were still attached to some of them. And thirdly, all the stumps appeared to be positioned at the same level, a true *in situ* forest.

Wow!! The contrast with some other Nova Scotia beaches could scarcely be more marked. One has only to think about Joggins which is much farther west, near Parssboro. Joggins is now a UNESCO world heritage site. As the sea works relentless on the rocky cliff by the shore, 5 m tall tree trunks are exposed extending vertically through numerous

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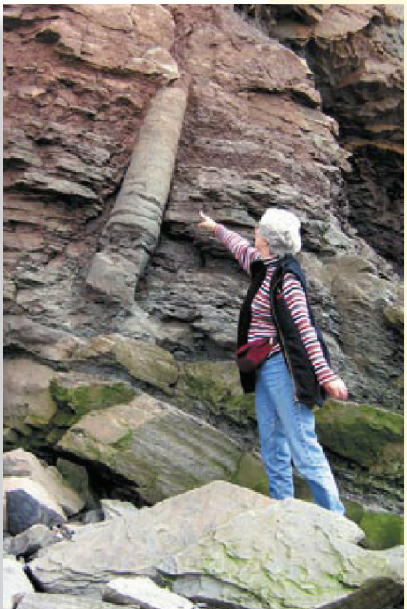

Where did purpose and planning come from?

While we may be aware of wonderful living creatures, we seldom reflect on the blessings of the material world. But the apostle Paul, way back in New Testament times in Lystra, assured his pagan audience that God provides favourable natural conditions to draw attention to himself. While God uses material blessings to draw attention to himself, some people wonder whether evolution can be included under the umbrella of God's providential design. Since evolution is by definition a process that involves only matter and energy, then the evolutionary process can never involve foresight or design which are non-material. When we look at life however, we see features which demonstrate intelligent purpose and planning, thereby pointing to the work of God.

To start our study of life, let us consider a basic process that occurs in every single cell. This is DNA transcription (the copying of DNA into RNA for the manufacturing of proteins needed to keep the cell functioning.)

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Adventures Await Everywhere!

strata of sedimentary rock. These lycopod (club moss) trunks, composed initially not of woody tissue but of something softer, were actually tall trees. They have been buried by shelly limestone, shale and sandy sediments which have turned to rock. So have the tree trunks.

Unlike the drowned forest at Hawk Beach, here at Joggins, the trunks are found at different levels in the cliff. Some trunks have roots still attached at their lower end. Various scientists have speculated that these trees represent successive forests which were gradually buried by sediments that accumulated over long geological ages. However when we compare this beach with Hawk Beach, we see that these hollow soft trunks could never have stood for long while sediments accumulated around their bases. It is evident that the Joggins forest did not grow where we now see it, but was swept up from elsewhere and buried all at once in a massive onslaught of water and sediment. Instead of a long slow burial process, the Joggins trees were buried catastrophically by amazing flood waters.

By the way, based on the fact that these *Lepidodendron* trees are extinct, and a major component of some coal beds, the Joggins fossils are said to have been part of a Carboniferous community, estimated to be 300 million years older than the Hawk Beach forest. But the estimated time interval is based on a number of assumptions such as how slowly the sediments accumulated. And we know the sediments came down quickly here!

Farther north in Nova Scotia on the Northumberland Strait Coast, on the beach at Brule (near Tatamagouche) another drowned forest has been discovered. Here too, the trees are encased in rock and are themselves also fossilized. This is the only standing forest of *Walchia* (an extinct conifer something like Norfolk Island pine). Similar trees grow in Australia today. In the deeply cracked rock lie stumps still in vertical position as well as tree trunks which lie prostrate in the rock. Imprints of foliage can also be found in the rock. Like Hawk Beach forest, this one appears to have been buried where it grew (*in situ*). However unlike Hawk Beach, the Brule forest appears to have been overcome by a sudden catastrophe that buried the whole community at once. There were also animals living in this community. The trackways of tiny lizards and large sail-backs proceed (for each species) all in the same direction. Based partly on the nature of the fossils, scientists suggest that these creatures lived somewhat after the Joggins community, now entombed in rocks they call lower Permian.

Obviously the fate of the modern drowned forest at Hawk Beach demonstrates how continuous exposure to the sea leads to tree remains that have been seriously worn away. The fossilized tree trunks, on the other hand, only have lasted because they were catastrophically entombed in sediments carried by raging flood waters.

Is it not good to discover new places which encourage research and thinking on our part? Now where should we go next?

For more in-depth information on maritime beaches see:

www.create.ab.ca/maritime-dinosaurs-and-other-fun-fossils/#more-363

www.create.ab.ca/maritime-beaches-their-grim-story/#more-712

dialogue

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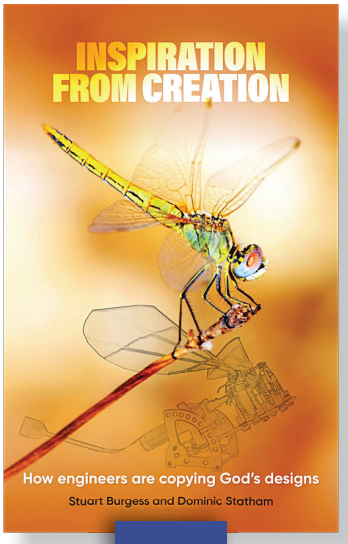


by M.J. Masters

Some years ago, I remember meeting a lady who was very excited at the realization that God is an artist! Similarly, I am very excited about a new book that portrays God as an amazing engineer. The lead author is engineer of exceptional experience and honours, yet he admits that mankind's skills in engineering practical devices are woefully lacking compared to what we see in nature.

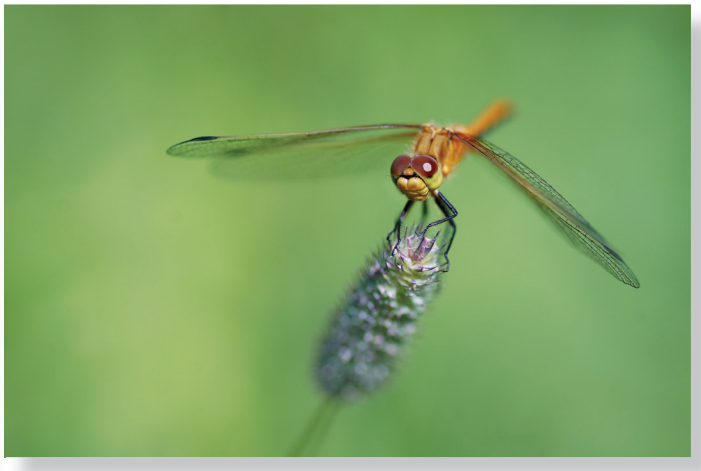
The book's cover displays a photograph of an adult dragonfly. At first you probably do not notice the robotic flyer below, a pale imitation of the natural prototype. To develop this insect-inspired micro air vehicle, would-be designers found themselves armed with nets and chasing dragonflies around the university grounds. Once they had some specimens, the engineers used high speed videos of their specimens in flight. Upon viewing the flight in slow motion, they discovered that the insects utilize a "four-bar" design system that allows four pivot points in the wings. They found that replicating this system was extremely complicated. In all there were nine variables that could be tweaked in endless fashion. Having eventually come up with a design, they needed to figure out how to manufacture the component parts. Using fancy wind tunnels, they tested their prototype. Their design exhibited only one third of the flapping capacity of the real dragonfly and beyond that their components failed.

Apparently a four-bar mechanism which produces specific motion paths (like wing flapping) is irreducibly complex. The whole system must be in place or none of it works. The authors describe other four-bar systems. They sought to develop, for example, a flexible thumb for an artificial hand. Their inspiration in this case turned out to be the jaws of a highly unusual fish from China. Again, of course, their system when developed, was nothing like as flexible as their fishy prototype.

Again and again, the authors describe highly engineered systems that come nowhere near the capabilities of natural models. One system caught my eye: phage viruses. There is a saying "Big fleas have little fleas upon their backs to bite them." Well bacteria are frequently attacked by phage viruses which shoot their DNA under high pressure into the host cell. The DNA is stored under such pressures in the virus head that it explodes into the victim's cell once an opening is made. During manufacture of a virus, a simple molecular motor pushes the DNA into the head by means of a force ten million times greater than an equivalent man-made motor pushing cable into a box. (pp. 100-103)

(For anyone who is interested in the highly remarkable process by which phage viruses push their own DNA into new virus caps (all manufactured inside a victim bacterial cell that did not have a firewall) see www.create.ab.ca/imagine-problem-solving/#more-7922)

Inspiration from Creation: How engineers are copying God's designs [2018 Creation Ministries International (US) Inc.] by Stuart Burgess and Dominic Statham is a delight to read. The discussion and full colour illustrations are all first rate. Even for systems which we already know, the engineering perspective enriches our understanding. (Paperback full colour 129 pages)



Where did purpose and planning come from?

Continued from page 1

A Japanese laboratory has produced a video clip that illustrates the complexity of the process. The proteins are drawn like angular machines, but you get the idea of how the system works. The subtitle is "From Genomic Information to Protein Synthesis." See: https://www.youtube.com/watch?v=J3HVVi2k2No

This reflection on the complexity of simply copying DNA leads to the question: what is DNA and why is it so important for life? It so happens that DNA is like computer code (which carries information). Whereas computer code is binary (2 options of + or -, arranged in groupings of 8 choices), so also DNA has options (ATCG). These are arranged in groupings of three (each triplet of which calls for 1 of 20 amino acids). Since there are only 20 amino acids which are useful for life, and 64 ways to arrange 4 letters, some amino acids have several identifying codes.

Most component parts of our cells, including such things as molecular machines, are made of proteins. The smallest possible proteins are about 150 amino acids long. This is because the string of amino acids must fold up into the kind of precise shapes seen in the Japanese video. It is electrical attraction between amino acids that lead to a precise folding process. Not surprisingly, the order of amino acids needs to be very precise. The chances of suitable amino acids lining up correctly by chance are so small as to be impossible. For example, to obtain four correct amino acids in a row, the chances are 1/20 x 1/20 x 1/20 x 1/20 equals one chance in 160,000. And so it goes as we try to produce a 150 amino acid protein or larger by chance. And that is just the start, we need many proteins for life.

Despite its fancy nature, we are assured by many scientists that that DNA sequencing (figuring out the order of the letters) has confirmed the reality of evolution. One such scientist is Dr. Francis Collins, Director of the National Institutes of Health in the United States. In 2007 he published a book entitled *The Language of God* by which he meant that God communicates the truth of evolution to us through the nature of DNA coding. The book was an instant best seller and convinced many to support the concept of evolution.

One of the main arguments concerning DNA sequences is that they reflect lines of descent from simpler ancestors. The idea is that an initial order of DNA letters in a simple ancestral creature, becomes more and more modified as the descendants themselves are separated in time from the ancestor and in appearance from other contemporary creatures with different characteristics. The evolutionists assume that descent from a common ancestor has indeed occurred and so they interpret their observations to fit this idea. The starting assumption can alternatively be false and the conclusions likewise can be false, but they do not consider that possibility. Thus Dr. Collins and colleagues expect to see overall similarities in the coding for common features in organisms (like polymerase in DNA transcription). In addition, they expect to see increasingly different coding as the creatures exhibit greater differences from each other in body plans. What biologists do not expect to see is a totally different DNA order for similar appearing features. Obviously, a creature with one set of component parts did not develop into a creature with a completely different set of component parts.

When we see a common blue print for a structure in different creatures but made up of entirely different component parts, many scientists declare that this is an example of "convergence." The definition of convergence is the appearance of a special feature in diverse organisms but no hint that change over time from a common ancestor might have been involved. Evolution cannot explain such "just because" features of life. Nature is full of examples of "convergence."

One of the most famous cases of this phenomenon involves the diverse creatures which possess a camera eye. The essential features of the camera

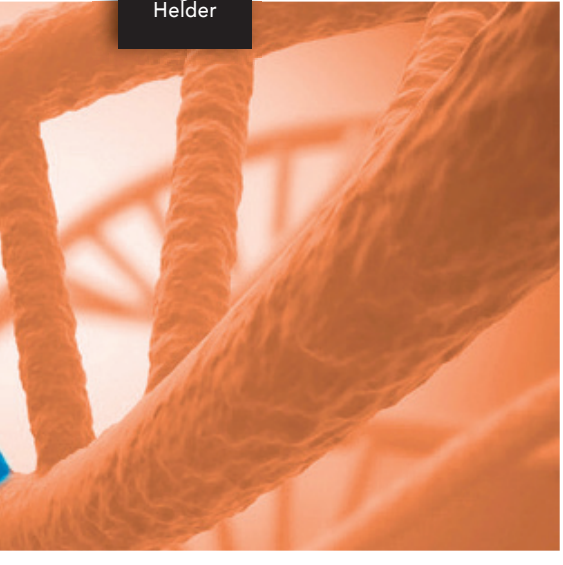
eye include a transparent lens and a layer of receptor cells upon which the lens focuses light. There are no similarities in body plan, and life style between the creatures which are blessed with a camera eye. Except for animals with backbones, the other creatures with such a feature constitute only one example out of a sea of similar creatures with no such benefit. See www.create.ab.ca/eye-deal-example-of-design/#more-8422

Besides such obvious physical structures however, we can see convergence in the information carried in the DNA. One of the most exciting recent developments in cell biology is CRISPR firewalls in many bacteria. This acronym stands for "clustered regularly interspaced short palindromic repeats." This system (discovered less than 10 years ago) uses short copies of potentially hostile invading code (ferried around the cell by CRISPR code) to identify incoming virus DNA which would, if left alone, take over the controls of the bacterial cell and turn it into a virus-manufacturing factory.

Once a piece of hostile code has been identified by the CRISPR, an associated set of proteins moves in to destroy the incoming malware and save the cell. Scientists call these "destroyer" proteins "CRISPR associated systems" or Cas for short. There are various Cas systems which are given different numbers to identify them. See www.create.ab.ca/natural-firewalls-in-bacteria/#more-5495

An article in *Nature* (19 January 2017 vol. 541 p. 280-282) declared that "Researchers have officially recognized 6 different types of CRISPR system, with 19 subtypes. And we only know how a fraction of them works." (p.282) The convergence among these Cas systems was exemplified by a recently discovered Cas system which displays "complete sequence dissimilarity to other CRISPR proteins." (*Nature* February 14/19 vol 566 p. 221) Thus the 18 authors (last author Dr. Jennifer Doudna) conclude "These data demonstrate how CasX activity arose through convergent evolution …" (p. 218) What they are saying is that no known evolutionary mechanism exists to account for how these new proteins came about.

by Margaret Helder



A further interesting example of chemical convergence is the odour receptors on insect antennae. See www.create.ab.ca/insect-talents-are-special/#more-9577 It so happens that the fancy shape of insect odour receptors look similar to odour receptors of other creatures such as ourselves, but the make-up of these proteins is unlike any other known protein family. Indeed the insect receptors exhibit "unique repertoires" of chemical composition. (*Nature* August 23, 2018 vol. 560 p. 447)

"God gives to ALL mankind life and breath..."

So where do unique proteins coded by unfamiliar DNA sequences come from? A news feature in *Nature* (17 October 2019 vol. 514 p. 314-316) considered this question. The author reported that "Scientists long assumed that new genes appear when evolution tinkers with old ones." (p. 314) But of course that explanation does not work anymore. Thus after much reflection, he concludes that "Although *de novo* [brand new] genes remain enigmatic [mysterious], their existence makes one thing clear: evolution can readily make something from nothing." (p. 316) Now isn't that interesting!! The journal *Nature* has published an article which attributes miraculous power to evolution but only God has such power.

These examples and many more reveal God who is personal, an awesome Creator who makes choices for beauty, for purpose and planning and amazing complexity. So what response does the testimony of nature demand? The apostle Paul had the answer to that too. He told the pagan Greeks on Mars Hill that "He [the God who made the world and everything in it] gives to all mankind life and breath and everything …. That they should seek God and perhaps feel their way toward and find him." (Acts 17: 27 +28) We could discuss any aspect of nature, but the answer will always be the same as that of the apostle Paul in Athens.

The Pangolin
One of the Strangest Animals Known to Humans

by Jerry Bergman

Pangolins are some of the strangest animals you will likely ever see. They are covered with scales like reptiles and look like a cross between anteaters and armadillos (Kierst, 2013). Because they are like no other animal, they were put in their own taxonomic order called Pholidota, Greek for "horny scale" (Benton, 2005, p. 348). Their tough, overlapping, reptile-protective keratin scales cause it to look like a giant pinecone with a long, thin reptilian tail. Its profile looks very much like a miniature dinosaur and nothing like the mammal it is. It is a mammal because they give birth to live young that suckle mammary glands as infants (Johnson, 2001, p. 31).

Although edentulous (toothless), they have hard, rough stomach walls that contain small rocks that grind up their food. They survive mostly on ants and termites captured by their extraordinarily long (40 cm), muscular, wormlike tongue that is almost as long as its body (Hutchins, 2003). The tongue produces saliva that sticks to its main meal, ants and other small insects. Its tongue muscles are attached to, of all places, its hip bones! (Ricciuti, 1994, p. 11). Pangolins are designed with thick protective eyelids and can close their nostrils and ear openings to protect themselves from insect bites (Ricciuti, 1994, p. 16).

They are the only known living mammals with reptilian-like scales, which are structurally and compositionally very different from most reptile scales (Choo, et al., 2016). Pangolin's scales consist of hairs glued together into large, overlapping plates that cover all but their soft belly, face, snout, and inner sides of their legs (Ricciuti, 1994, p. 8). These parts are hairy, like mammals. Its overlapping scales can protect its body and its face when they're both tucked under its tail (Hutchins, 2003, pp. 107-113). Their sharp scales, which can be raised upward like porcupine scales to make the animal appear larger, provide critical defense from predators. For protection they can also curl up into a tight ball like an armadillo (the name pangolin is from the Malay word 'pengguling,' meaning "one who rolls up"). When sleeping, like a good mother, they protect their babies by curling around them. Like a skunk, they can spray enemies with their pungent spray to help defend themselves. They have poor eyesight, but a very acute olfactory system that provides them with an incredible smell ability (Choo, et al., 2016, p. 1).

Six species exist. The smallest, the long-tailed pangolin, are three feet long and weigh three to four pounds. The largest, the giant pangolin, are close to six feet long and weigh 70 pounds (Ricciuti, 1994, p. 10). Its four feet each have five claws that it uses to climb trees and rip open insect nests for meals. The claws are curled under when walking, causing it to look like a knuckle walker. When forced to run, pangolins stand up and run three miles per hour on two feet like humans! It uses its tail to help it balance (Ricciuti, 1994, p. 11). Their tails also help them climb trees by grasping the branches like monkeys!

Classification and Evolution

Classification has been a major problem as documented by the many past, failed classification attempts. They were once classified with various orders of ant-eating mammals, the Xenarthra, which include true anteaters, sloths, and armadillos, which pangolins superficially resemble. Newer genetic evidence, however, points to their closest living relatives as the Carnivora which forms, together with the order Pholidota, the clade Ferae (Penzhorn, 2013, pp. 438–443). Other evolutionists have classified the pangolins in the order Cimolesta, together with several extinct groups, though this idea has also fallen out of favor since cimolestids were not placental mammals as are pangolins (Rook and Hunter, 2013, pp. 1-17).

A 2015 study found close affinities between pangolins and the extinct group called Creodonta (Halliday et al., 2015). In short, pangolins have features of several diverse animals that have stymied not only their classification, but also any attempts to determine their evolution, a subject largely avoided due to almost no hint of change in the fossil record. A number of extinct pangolins have been found, all modern "living fossils."

The combination of monkey, anteater, skunk, armadillo, with a profile like a dinosaur has baffled zoologists for decades, so they just put pangolins in a class by themselves because no one can figure out what life-form they are related to! The best conclusion is the first pangolin was a pangolin and is not related to any other animal, although it has traits like several very different animal kinds [aka a 'mosaic' creature]. They can climb and sleep in trees, walk and sleep on land, dig burrows as deep as 30 meters deep to live in, and are even expert swim-

mers (Ricciuti, 1994, p. 14). The only means of travel they are unable to use is flying.

Evolution of Pangolin Scales

The selective forces underlying the origin of this unique mammalian-reptile scale trait remain a mystery, although observations of the eight modern species suggests the defensive armor functions as protection against predators. Choo, et al., proposed pangolin scale evolution was partly "an innovation that provided protection against injuries or stress and reduced pangolin vulnerability to infection." A

sequence of its genome, found the Malayan pangolin genome contains 23,446 genes and the Chinese pangolin 20,298, which is very close to the size of the human genome (Choo, et al., 2016).

The "Just-So"-Story Explanation for Scale Evolution

The well-known genetics professor Ricki Lewis reviewed the Choo, et al., study that attempted to understand how and why their scales evolved. She wrote in the new *Genome Research Journal* that the study "provides the basis for a 'just-so story' about how the pangolin — aka the scaly anteater — got its scales." In short, the pangolin armor is said to have replaced part of its lost immune protection with scales! (Lewis, 2016) Lewis explained:

"Darwin and Lamarck pondered the advantages of the giraffe's long legs and neck, while a few decades later Rudyard Kipling [humorously] explained how the leopard got its spots. [In short, humans painted brown spots on the leopard's fur, so that the leopard would blend in with the environment and not be seen by its enemies] Today, genome sequencing is fleshing out *what we thought we knew* about some distinctive animal adaptations, from the giraffe to the leopard." (Lewis, 2016)

She continues, noting the interferon epsilon gene which provides a "first line of defense" against skin infections was damaged in both pangolin species that Choo, et al., studied,

"as well as in their African counterparts. Yet it is fully functional in 71 other species of placental mammals, where it provides a "first line of defense" against skin infections. Several other interferon genes, which deal with infection, inflammation, and skin healing, are missing too. The Malayan pangolin has three, the Chinese pangolin two, yet other mammals a full set of ten." (Lewis, 2016)

She then gives the just-so story of how she thinks the scales evolved: "At some point in time, a few pangolins, thanks to chance mutations, had harder hair. Other mutations somehow guided those hairs to eventually overlap, providing shielding. Individuals whose hairiness began to become overlapping scaliness were less likely to succumb to bacterial infections, and thereby more likely to survive to pass on those traits." (Lewis, 2016)

Lewis continues with her just-so story, adding that some clues in the pangolin genomes suggest their

"armor has replaced part of the immune response. The tightly-knit, tough scales deter not only predators, but keep the animal free of infection. Although it is intriguing to imagine reasons why animals are as they are – from the giraffe's neck to the leopard's spots to the pangolin's armor – clues in DNA sequences can provide a broader and less biased view [comparing] those that have stood the test of evolutionary time to those relegated to the genomic junkyard." (Lewis, 2016)

The problem is, a major reason why pangolins do not survive in captivity is they often die of disease, possibly because their immune system is severely compromised due to the mutations noted, but still can survive because of their well-designed armor. Even in a protected environment, wild disease is a problem (Ching-Min Sun, et al., 2019). Nonetheless, this just-so story, as Lewis notes, is an imaginative narrative not based on fact except what appears to be the loss of one or more genes critical to their effective immune defenses. This is evidence of genome deterioration and de-evolution, not the addition of new information or genes as is required for 'onward-and-upward' evolution.

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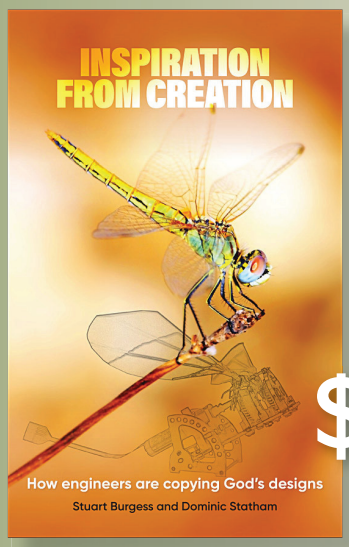
Digging for facts is a better exercise than jumping to conclusions!



Inspiration from Creation

Stuart Burgess and Dominic Statham

Engineers who are highly skilled at invention, find that they cannot, with our best technology, duplicate the functions of living creatures like dragonfly flight. What we can do however is study the design principles upon which the successful talents of creatures are based and try to develop our pale imitations. These studies provide amazing insights into the mind of God.

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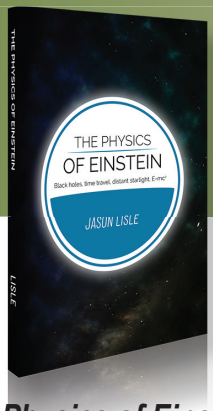

Physics of Einstein

Jason Lisle

For those who love numbers, this book declares that logic, geometry and mathematics are windows into the mind of God. The author explains general relativity theory in detail and declares that nothing in this theory is inconsistent with God's supernatural creation of the universe a few thousand years ago.

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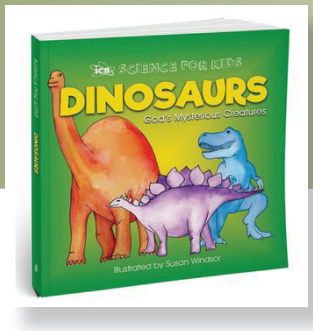

Dinosaurs: God's Mysterious Creatures

ICR writers

This comprehensive introduction to dinosaurs is guaranteed to get youngsters, ages 5 – 10, enthusiastic about these creatures if they are not already so. With non-threatening looking illustrations, we learn about different types, lifestyles such as team veggie or meat lovers, also origins and their fate. The "fun facts" encourage continued motoring through the book.

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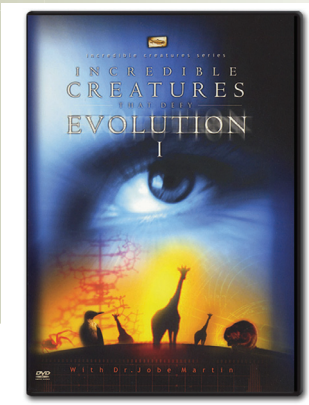

Incredible Creatures that Defy Evolution # 1

Exploration Films

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