Wonderful Wood! Versatile and Beautiful

by Moxie

Have you ever noticed how beautiful objects are which are made of wood? The people of Bible times also appreciated and used beautiful wood. The ancient Phoenicians (Canaanites) exported cedar wood for temples and palaces of many contemporary empires. One of their more famous customers was the Assyrian Sennacherib (about 700 B.C.) who commissioned two fleets of ships to be built from the cedars of Lebanon, one for the Tigris River and the other on the Euphrates River. King David himself made extensive use of cedar wood in his palace and his son, Solomon, proved to be even more enthusiastic about the cedars of Lebanon (*Cedrus labani*). Solomon promised massive payments to his friend and father-in-law King Hiram of Tyre in return for importing cedar trees for the temple. Much later, the Romans sought cedar wood from Lebanon for their own ships.

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CREATION SCIENCE
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Preserving the Joy of Creation

by Margaret Helder

A lot of people in these COVID times, especially young people, are growing tired of the same old scene, the same four walls, the same view out the windows. No matter how beautiful the scene, it soon ceases to interest us if that is all we see. Nevertheless, even in our same old environments, it is still possible to maintain the flame of interest in the creation. Some young people in Alberta recently shared with me some of their interests in the creation. Clearly their stories show how they are keeping their interests alive. Indeed, these stories can help enhance our appreciation of the creation too.

Eight year old Tiara said "I like the Aye Aye. It has been created with a long finger so that it can tap on the bark of trees and then fish out insects that surface." Do you realize that Tiara has already expanded our interests? The Aye Aye is a tiny lemur from Madagascar, off the east coast of Africa, and it indeed exhibits a remarkable finger and a remarkable talent.

Rayna too, age nine, shares her story with us. It so happens that she has some pets. "When one of my female guppies had babies, I saw them dropping onto the gravel in my fish tank. Baby guppies are born live, which is different from most other fish. Most fish lay eggs. Guppy parents will eat their babies while they are small, if they can find them." How fun it is to make observations in one's home. It certainly makes sense that the guppy babies drop down hopefully out of sight of the parents (perhaps in nature into aquatic vegetation). It is interesting that guppies, which are so tiny, have been designed for live birth. Another fish that gives birth to live young is the Coelacanth, famous as a living fossil.

Alisha, also nine, shared her story with us: "In science class we were learning about gears in our unit on wheels and levers, and I remembered a video that my grandma had sent to me. This video was about an insect called a planthopper that hops super far using gears in its body. The gears are used to keep the planthopper balanced, because the gears connect the legs together so that the legs push off at the exact same time. I thought it was so cool how scientists found gears in a bug and that technology can learn from a bug!" Here is a link to that video:

https://uncommondescent.com/intelligent-design/mike-behe-looks-at-the-actual-gears-in-bugs/

Shem, who is ten, shared with us "I like the Bush buck. It is a species of antelope in Sub-Saharan Africa. Its mother hides it in the tall grass so that predators don't see it." This is

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Preserving Creation

an important point about the creation. Not only are creatures well designed in their anatomy and physiology (body processes), but God has also conferred on them suitable behavioural skills to assist them to survive.

Matthias, age 12, makes the same point about a reptile in Southeast Asia. He says: "I like the Draco Lizard. It has been created to use its "wings" and tail to glide through the air in order to escape the predators on the jungle floor." Here we see interesting anatomy and unusual behavioural skills in a reptile. Apparently they can leap 30 m (100 ft) from one tree to another. Very interesting, Matthias. Now my interests are shifting to Southeast Asia!

Kirk turns out to be a very interesting young man. In a suitable aquarium, since last summer, he has housed a crayfish which he collected from a local river. Since then, he has watched it grow and molt several times. Kirk tells us "Crayfish can learn because if you regularly feed them raw meat with your hand, they will get used to your hand and always come out of their den when they see it. They will also let you pick them up without pinching you. Also, whenever I hold my algae wafer jar against the glass, my crayfish tries to climb the glass and get to the algae wafers." It is certainly good to remember how unique and special every creature is which God has created.

Karen, who is fourteen, shares with us her new interest. She says: "Recently I have started getting into photography, and nature photography in particular. As I have been taking photos, I have begun to notice all the beauty and complexity in all that God has created. There is truly so much beauty in nature all around us, all we have to do is look." Karen, not surprisingly, pursues a lot of artistic interests including painting and sketching.

Jerusha, also fourteen, turns our attention to quite a remarkable animal. She tells us: "I like the elephant shrew because it has been created to always be cleaning its trails. If there is even one small obstruction, it can be fatal as it depends on clean trails to escape lizards and other predators who chase it through its tunnels." Oh my, what an interesting choice, Jerusha. Apparently, at 29 kph or 18 mph, this small insect-eating animal from Africa, is one of the speediest small mammals living today.

The last contribution is from Lincoln, age 14, who has been working with electronics and building his own computer from resistors, transistors, wires and other parts. He has recently started looking into sending and

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receiving radio waves. Thus "I have been learning what I can comprehend about broadcasting radio waves. It's quite amazing to see how the laws governing light interact, making a perfect system. The speed of light is a constant. This is important because you must use it to get the radio signal's wavelength, and then take one half to one tenth of the wavelength to calculate how long your radio antenna should be." It is certainly important for us to remember that the physical world is part of the creation and we can use its amazing features to our benefit.

Ralph, a friend, summed up the message of this article when he said: "As far as keeping Creation in mind, I think this is vital during times like we are in. Understanding and placing our hope in an all-powerful and loving God gives us perspective in the face of a challenging situation that may seem overwhelming. Affirming creation as opposed to evolution helps to keep our faith in Jesus rather than in the world and to persevere in the times we are given. We don't ignore the threat of the virus and civil unrest, but the foundation of our hope is built on a rock, as we find ourselves in a storm."

Exciting Coelacanths

There is a fascination with living organisms that closely resemble fossils dated at millions of years old. The classic definition of a living fossil is an extant organism that closely resembles fossil specimens.

In 1938 Miss Marjorie Courtenay-Latimer of South Africa recognized that among recently caught fish, one specimen was unfamiliar. It turned out to be "the only living member of an ancient group of lobe-finned fishes that was known previously only from fossils and believed to have been extinct since the Late Cretaceous period approximately 70 million years ago (Myr ago)"[1] Much later, in 1997, a second species of this fish was discovered in the seas around Indonesia. The two species were named *Latimeria chalumnae* and *L. menadoensis* respectively.

Although the two populations of coelacanth resemble each other, they were given different species names because of some genetic differences between the two groups. The similarity in appearance however also extended to the fossil specimens. As an article in Nature declared: "Fascination with these fish is partly due to their prehistoric appearance – remarkably, their morphology is similar to that of fossils that date back at least 300 Myr, leading to the supposition that among vertebrates [animals with backbones], this lineage is markedly slow to evolve."[1]

The resemblance of the living coelacanth fish to such apparently ancient fossils, naturally raised the question whether "the genome of the coelacanth is as slowly evolving as its outward appearance suggests."[1] Indeed, recent genetic work on the coelacanth had suggested that this fish does not show a lot of genetic variation. But a serendipitous discovery changed this view.

A graduate student at University of Toronto was assigned an evolution-based project: to find out what organism(s) display ancestral versions of the human gene CGGBP1 which is involved in gene regulation. Thus, Isaac Yellan searched genetic databases of different animals for sequences which resemble this gene. Very unexpectedly he found that the coelacanth has many variations of this gene, 62 of them to be exact.[2] This is far more than any other vertebrate, and the coelacanth is not even included in the category of reptiles, birds and mammals where an organism might be expected to display such a gene.

The speculation which the authors offer is that the CGG Binding Protein is similar to a specific family of jumping genes (transposons) which might several times have invaded the germ line of the coelacanths so that all offspring would express these genes. Even if this were possible, why does the coelacanth exhibit astonishingly high versions of a gene when it was not expected to have even one? However, it is not even certain that the CGGBP genes came from jumping genes. What we do know is that this living fossil harbours far more genetic diversity than anyone ever expected. Whether the rate of change has been fast or slow, it is evident that the coelacanth has only been around for thousands not millions of years.

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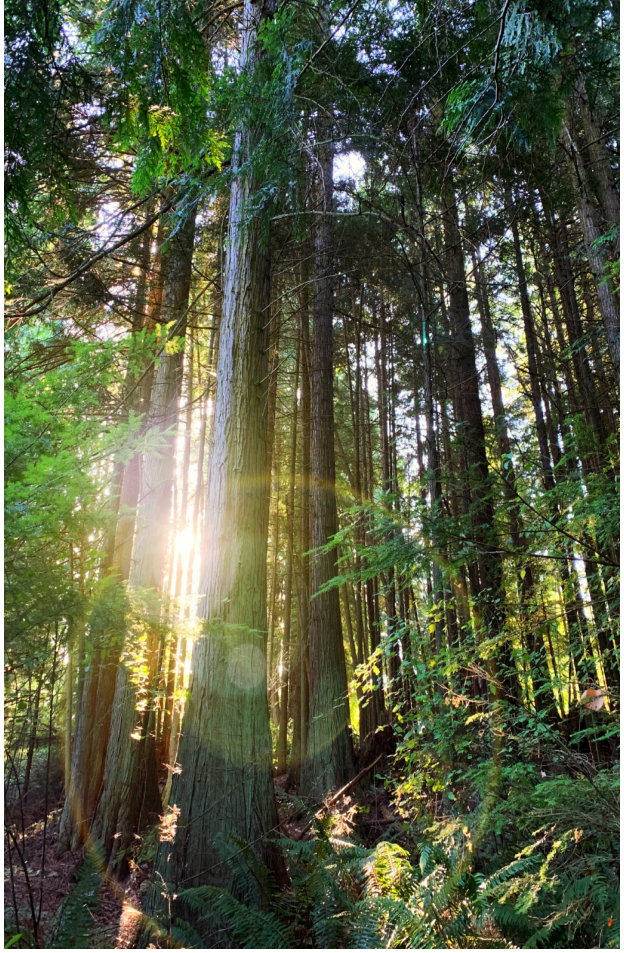
Wonderful Wood



However, Emperor Hadrian cautioned against over-exploiting this resource. Unfortunately, nobody listened and few of these trees remain today.

The cedars of Lebanon trees exhibit a wide flat canopy and they can attain a height of 80-120 feet (24-37 m) with trunks of 4-8 ft (1.2-2.4 m) in diameter. Under ideal conditions, the trees can live for 1000 years. Their wood is fragrant, beautiful and remarkably durable. King Solomon also purchased other kinds of wood for his temple and palace. In I Kings 6 we read how the cherubim over the ark of the covenant in the temple were carved from olive wood (*Olea europaea)* which is hard, rich in colour, with straight grain and fine texture. However, it is not suitable for outdoor construction. Another beautiful wood product that King Hiram brought to Solomon (probably from India) was red sandal-wood (*Pterocarpus santalinus*), referred to in I Kings 10:12 as almug wood. This wood is also dense, hard, close-grained and of a fine red colour. King Solomon used it for supports for his palace and temple as well as for fine musical instruments like the harp and the lyre.

Wood Comes from Trees

Perhaps we do not reflect enough on what an amazing material wood is. We all know what wood looks like, but we seldom think about how it develops. Indeed, there are lots of plants with conducting (vascular) tissue whose stems never grow any thicker and thus which have no wood. They may contain one or more strands of phloem and xylem (vascular) tissue running from root tip to stem tip. The phloem transports products of photosynthesis down through living cells to all parts of the plant. The xylem, on the other hand, consists of empty cells with thickened walls made of indigestible cellulose and lignin. Arranged end to end, these xylem cells transport water from the roots to all parts of the plant. Specimens with no secondary thickening are called herbaceous plants and typically last less than a year.

A plant needs special innovations if is to develop secondary thickening or secondary xylem (wood). Like stem cells in our bodies which are able to continue dividing indefinitely, many plants possess a tissue with cells that are able to divide indefinitely. This is called the cambium. The cambium produces new cells on its inner circumference that develop into rings of wood. On the outer circumference, the cambium produces phloem cells just under the bark. As the cambium continues to divide, the tree trunk becomes thicker with more and more wood.

Fossil Wood in Unexpected Places

The vast majority of plant species are not woody. We possibly do not notice that trees are in the minority of plant kinds since they are so conspicuous. From an evolutionary point of view, biologists long assumed that small non-woody plants developed long before plants with the capacity to form wood appeared. They looked in the fossil record and found a lot of non-woody plants in the lowest levels of Devonian rock. They therefore figured that woody thickening of plant stems is a sophisticated feature that followed the appearance of many herbaceous land plants. This belief was challenged however by the discovery of a woody artifact in lowest level Devonian rocks in the Campbellton Formation of New Brunswick. This find and a similar one from France were found at the same level as the lowest lying vascular plant fossils.[1] How, if evolution had indeed occurred, could the descendant appear at the same time as the supposed ancestor?

More recently another woody plant fossil has been found in lowest lying Devonian rock on the Gaspe Peninsula of Quebec, not far from the Campbellton Formation in northern New Brunswick. Making the best of a bad situation, the authors of this last Canadian study conclude that the capacity to make wood appeared in plants even before

many vascular plants had actually developed.[2] It is certainly safe to say that botanists have no reasonable evolutionary explanation for how the capacity to make wood appeared. However, we have recently learned that at the molecular level, the formation of wood is a spectacular process!

Molecular Machines Produce Unique Features

A study just published (January 2021) from Europe has managed to observe the development of xylem cells before they become empty water conducting vessels. Apparently before they die, these cells organize the depositing of bands and spirals made of cellulose to strengthen the cell wall against collapse when the cell is empty. This study reports that the cell needs the help of special proteins in order to produce the amazing pattern of thickening so characteristic of each type of wood. According to this study microtubules which are actually part of the cell's cytoskeleton, here provide tracks under the cell's outer membrane. Nobody knows how the microfibrils choose the unique filigree patterns that guide the deposition machinery (molecular machines in the plasma membrane). "This machinery moves along the microtubules like an asphalt paver and continuously deposits wall material on the outside of the cells. The microtubules thus act like an instruction manual for cell wall synthesis." [3] This elaborate process results in extremely strong walls that make the water conducting wood so efficient.

The capacity to form wood is totally amazing! I am not sure if the ancient peoples gave thanks for that blessing, but there is no doubt that we should be thankful for the creation of plants, including all those wonderful trees!

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Biological Clocks
The never-ending Story

by Margaret Helder

I remember hearing a biologist from Bristol in England. He was talking about his studies on diatoms (algae with glass walls). He described how he set out to study the activities of these cells on the nearby seashore. To collect the diatoms, he said, he used English toilet paper which was scratchy and impervious to water. The English students laughed uproariously at this. The Canadians, sitting straight-faced, did not realize this was a joke! At any rate what he found was that the algae emerged from below the sand surface during low tide in the day, but they then moved back under the sand before the tides returned at a different time every day. This is the kind of timekeeping ability in organisms that biologists were beginning to study. There were studies on people living alone in dark caves, studies on algae that glow in the dark, and fruit flies that emerge from the pupa at a certain time of day. How do they keep track of time?

Asking Questions

Such questions were the beginning of a never-ending research program. One early review of the subject declared: "The circadian rhythms are now the object of intense research work because their basic mechanism, the Biological Clock, is entirely unknown."[1] That was 1967. As more and more examples of processes driven by rhythms accumulated, biologists deduced that an internal system of time keeping must be involved.[2] One lady biologist studying marine algae and bioluminescence, reflected that the easiest way for organisms to keep track of time would be to simply observe the onset of day or night. However, she declared: "In a great many cases, surprisingly, a more complicated mechanism has evolved to accomplish this temporal regulation, a sophisticated biological 'clock'."[3] She further speculated: "It is likely therefore that the generation of

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Biological Clocks

oscillations requires protein synthesis on cytoplasmic ribosomes. We know nothing of the nature of this protein or proteins at the present time." [4] That was forty years ago.

In the mid-1970s, biologists believed that all organisms with eukaryotic cells exhibited such time keeping, but not blue-green algae (*cyanobacteria*) which lack a defined nucleus.[5] Finally, in 1998 a report was published that cyanobacteria do indeed exhibit a biological clock just as do other creatures. However, there was a further surprise in this discovery: "Despite the common scheme, the proteins that make up the cyanobacteria clock are completely different from those of other organisms."[6] This finding inescapably demonstrated that a single evolutionary origin of clocks and descent with modification, was not possible. Thus "clocks seem to have arisen multiple times, recreating the same design each time."[7] (This is not an evolution friendly conclusion.)

Hints Begin to Appear

About this time, at the end of the 20th century, scientists finally isolated a protein apparently connected with timekeeping in mice. Some proteins that regulate timekeeping had been uncovered in organisms like bread mold, but not from anything like a mammal. A commentator reported that the gene isolated was colossal about 100,000 nucleotides long.[8] This would produce a whopping protein about 33,000 amino acids long. From its structure scientists concluded that its function must be to regulate the effect of other genes, which has turned out to be true. So, scientists were now on track to find other relevant genes and other proteins produced by these genes.

As the new millennium dawned, biologists happily began to develop models that included genes and their mandated proteins. Apparently in these systems, as the proteins accumulate in amount, they inhibit the action of their own gene. Once the product has declined in amount, then the gene starts to drive synthesis again. This is a simple feedback loop, but there is nothing simple in the clock system. Various proteins interact together and this impacts the feedback system. Thus, there remains the challenge "to extract some order in the overwhelming increase in complexity" that they have discovered. This is still the challenge.

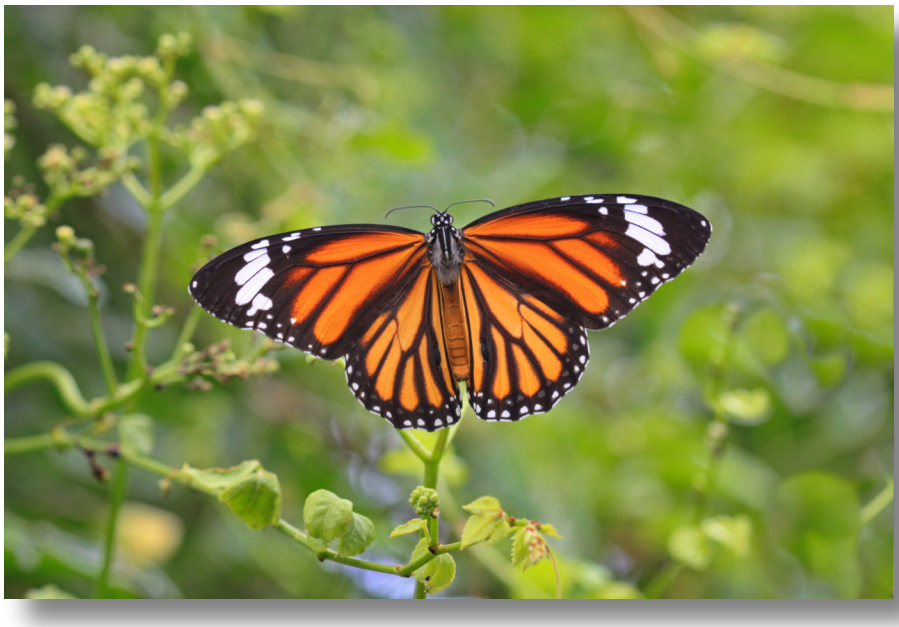
Biologists always look for an easy-to-raise organism which will exhibit features of most other organisms. They had hoped that the fruit fly (*Drosophila*) would represent their general model, but they soon found that in its clock keeping proteins, the fruit fly is not even similar to many other insects. The fruit flies exhibit only cryptochrome 1 (hidden pigment responsive to blue light), but honey bee and red flour beetle have only cryptochrome 2 and Monarch butterflies exhibit both cryptochrome 1 (CRY1) and cryptochrome 2 (CRY2). Because of the impact of biological clocks on its annual migrations, the Monarch butterfly clock has been very much studied, and in its details, it is not too different from mammals.[9]

Clock Gears are Proteins

What biologists soon found when they began to look for genes and their resulting proteins was that the proteins called CLOCK and CYCLE (the latter may also be called BMAL1) form a partnership.[10] This combination is the critical gear of all animals studied.[11] There are however a few other proteins that interact with this gear. At night CLOCK-CYCLE promote the copying of information from the genes *per* and *tim* resulting in the accumulation of the proteins PERIOD and TIMELESS. These proteins are at their highest levels about four hours into the day (along with CRY2). All of these are at their lowest level early in the night. Then CLOCK-CYCLE get to work to promote the transcription of the proteins PER, TIM and CRY2 (short-hand names for the proteins named above.)

The story is further complicated by the action of CRY1 which, at the onset of daylight, initiates the breakdown of TIM. But PER interacts with TIM to protect the latter from too rapid degradation and PER also protects CRY2 from declines in amount until late in the day. The upshot of all this is that PER assists CRY2 to enter the nucleus and keep CLOCK and CYCLE from promoting formation of other clock proteins during the day. At night the CLOCK-CYCLE duo work to promote the formation of all these proteins. During the day all the proteins decline, at night they all increase in amount and finally dawn sets the cycle rolling again by its impact on CRY1 which impacts TIM which eventually impacts CRY2 which impacts CLOCK-CYCLE and around we go![12]

The research never ends however. About the same time that the effect of all these proteins was being described, scientists reported, to their surprise, that the time keeping clock in the Monarch is in their antennae! Many studies have been published trying to explain how the butterfly's time keeping clock enables them to orient by the sun which constantly moves across the sky as the butterflies plot a continuous course south west to Mexico in the fall.



More Complications Now?

We do not expect as many new discoveries on the biological clock after so many years. However even in 2021, the story became more complicated. Now so-called "junk DNA" has also been found to play a role in biological timekeeping.[13] You may remember that junk DNA is genetic information that does not code for a gene that produces a protein. Many scientists have supported the idea that such non-coding DNA does not do anything important in the cell and can thus be considered useless or junk. Recently we have seen an avalanche of studies reporting that non-coding DNA does all sorts of important things. Now, noting that circadian (daily) clocks impact human health, American scientists have discovered a "genome-wide regulatory layer made up of small chains of non-coding nucleotides known as microRNAs (miRNAs)."

While studying the complicated dynamic regulation of biological clocks in mammals, they found a whole bunch of short RNA strands (about 22 nucleotides long).[14] The scientists screened about 1000 of these molecules for impact on biological rhythms and found, much to their surprise, that about 110 to 120 miRNAs actually modulate the biological clock.[15] These small molecules target information (mRNA) coming from the nucleus before the clock proteins have been manufactured. These studies suggest "pervasive regulation of the clock"[16] by these tiny non-coding pieces of RNA. This study has thus demonstrated a "new layer of control of the circadian networks by non-coding RNAs." [17]

What's it Matter?

There are quite a few aspects of this study that support the creation model. Firstly the fact that there are many different clock systems found in organisms makes descent with modification impossible. Secondly the great complexity of the system certainly is a strong indication of design, and thirdly, the contributions of non-coding DNA to the system, certainly is significant. Many supporters of evolution have claimed that "junk DNA" represents left overs from a long history of evolution. This clearly is not the case either.

So, just when we supposed we had the system largely figured out, new complications appear. The finesse of the biological clock should make us humbly consider how all this came to be. Surely the Master Designer claims our awe and our worship.

For more on 'junk DNA' see https://crev.info/2020/11/encode-iii-junk-dna/

Footnotes

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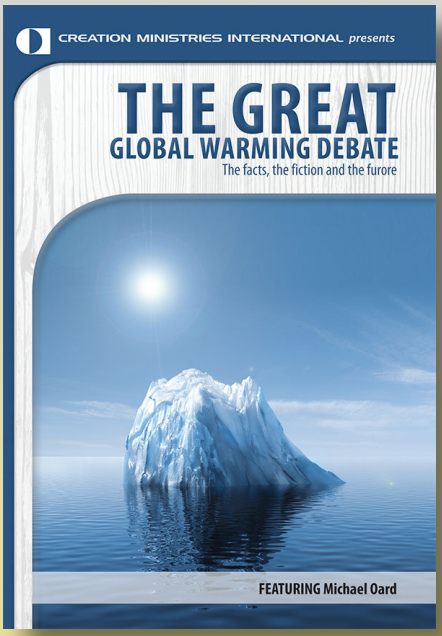

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Michael Oard

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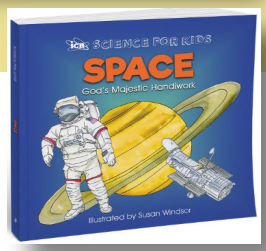

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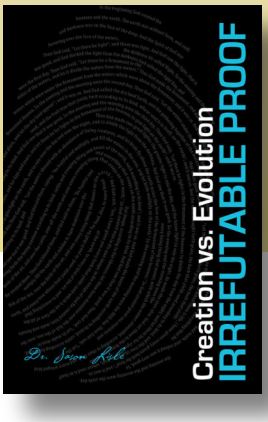

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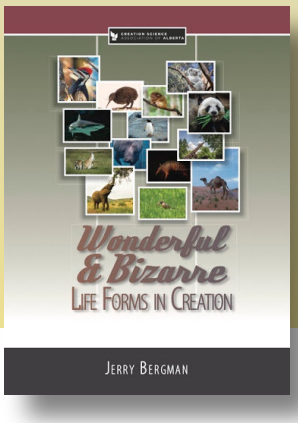

Jerry Bergman

Wonderful and Bizarre Life Forms in Creation

We may think we know about many of these creatures, but actually a lot of their characteristics are unfamiliar to us. Enjoy the discussion, the pictures, the highlights, and if you are so inclined, the references. Find out how the features of these creatures testify not to an evolutionary origin but to their creation. Fun for the whole family!

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