Invention:
A new idea makes it work

by Moxie

Canada's is proud of her connection with some great inventors, although sometimes the connection is a little remote. Consider the story of Guglielmo Marconi's invention of wireless communication (radio). He spent only three weeks in St. John's Newfoundland, but he made the city famous nonetheless. It was in mid-December 1901 that Marconi successfully received signals sent by collaborators from Cornwall, England, a distance of 3430 km (2100 miles). Within a few days Canada concluded an agreement with the inventor for the construction of a wireless communication station in Cape Breton. This provided him with a subsidized monopoly. Marconi then left Canada and the rest is history.

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CREATION SCIENCE Dialogue

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Squirrel Wonders and the Failure of Evolution to Explain Them

One of the most abundant wild mammals living in moderate latitudes is the common squirrel. Squirrels thrive in almost every habitat, from tropical rainforest to semiarid desert. They avoid only the cold polar regions and the driest deserts. Squirrels are also one of the very few mammals that thrive in cosmopolitan areas. Some wild squirrels have even become pets of a sort, or at least comfortable around people, if the human is patient and not aggressive towards the animal (Rose, 2014). As two of the leading squirrel authorities observed, "one can only marvel at how well adapted squirrels are to exploiting a forested environment" and, one could add, an urban environment as well (Steele and Koprowski, 2001, p. 11).

Their diversity is enormous and the squirrel family includes, not only tree and ground squirrels, but also flying squirrels, chipmunks, marmots, groundhogs and prairie dogs, all which deserve a separate paper. Many of the 273 squirrel species live in North America where they have very few enemies. This paper covers only tree squirrels, which nest and live in trees and have bushy tails to help them balance while running up and down trees. Ground squirrels live on the ground, have shorter, less bushy tails, and their fur is usually brown-gray with gray and white dots.

by Jerry Bergman

Extremely Well-Designed

Squirrels are very well designed for their terrestrial and arboreal life. Growing up in Michigan, I remember tree squirrels moving on the ground by a "hopping run" travel mode to scurry up a tree. Their sharp claws enable them to run down the tree about as fast as they can run up it. Their trademark is their slender bodies with very long, very bushy tails. The term 'squirrel' derives from the bushy tail, which is one of their more-defining traits. Their large eyes give them excellent vision, allowing them to jump from one

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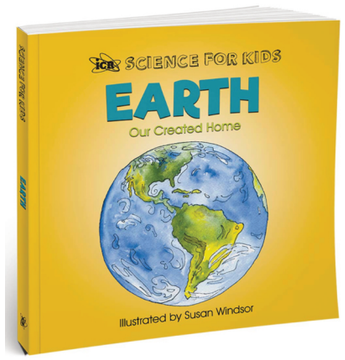
ⓘ – Book Review

Earth: Our Created Home

by Alisha Bain

Did you know that there is a new book in the ICR Science for Kids Series? It is called Earth: Our Created Home. I am 9 years old and I have read this book. I will tell you who will enjoy this book, why people will enjoy what it teaches about God, and how interesting this book is to read.

You may wonder who will enjoy Earth: Our Created Home. This book is great for younger kids like 6 year olds to 12 year olds, but any age can read it! Younger kids can read one or two pages a day, or older kids might want to read the whole book at once. This books is also great for kids who are interested in our planet. If kids want to learn more about the Earth, this book would be great for them to read.



When reading this book you may enjoy how it talks about the Earth as God's creation. I like how it explains God's plan to save the animals and Noah's family from the Flood. Also the book shows God's power – His power to speak and make land and water appear. I think it is great when it talks about how God made everything so amazing like how he made the Earth have four seasons, and how he made this planet just right for life. There are also many other interesting topics about our Earth that God made.

This is an extremely fascinating book about the Earth. It has striking information talking about the Earth and it gives an overview of Genesis. You do not just learn about the Earth, but you learn about how God's creation of the Earth is part of our beliefs as Christians. I like that this book talks about some events that happened like the Flood and the Ice Age and about the evidence in the world that we can see because of these events.

Now you know what to expect when reading this book! You will find that it is good for many ages especially ages 6-12, you will find that it teaches about God throughout the book, and you will find that it is fascinating to read.

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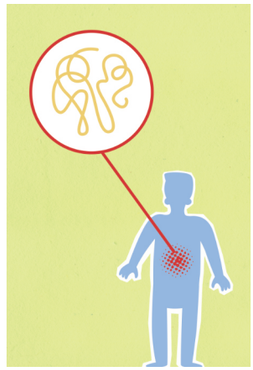
Great Expectations

by Margaret Helder

For many years, evolutionists have claimed that the bulk of the human genome is junk, debris left over from long periods of evolution. These people should rather have asked what was the function of these long stretches of non-coding DNA (about 97%). Recent research such as the Human Genome Project (HGP) has vindicated those who rejected the junk DNA idea and the insights keep on coming!

This year molecular biologists are celebrating the 20th anniversary of the publication of the first draft of the human genome. In keeping with this effort, the journal *Nature* devoted the February 11 cover feature to this story. Their leading Commentary was entitled "A wealth of discovery built on the Human Genome Project – by the numbers." [vol. 590 #7845 p. 212-215] The main conclusion was that "The results highlight how the Human Genome Project (HGP), with its comprehensive list of protein-coding genes, spurred a new era of elucidating the function of the non-coding portion of the genome and paved the way for therapeutic developments." [p. 212] Note the reference to function in non-coding DNA. If it were "junk," it would have no function.

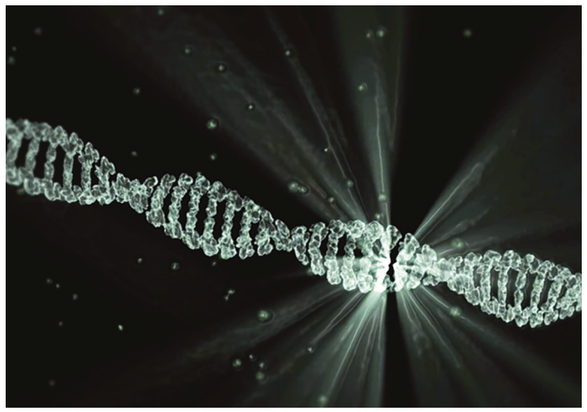


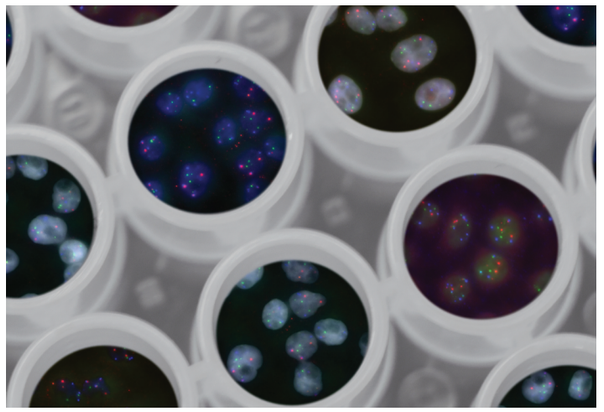
As a result of the above research, the number of protein coding genes levelled off at about 19,150 "far short of the 100,000-strong estimate previously adopted by many in the scientific community." [p. 212] But that was not the main story in the subsequent 20 years. Instead, "With the HGP draft in hand, **the discovery of non-protein-coding elements exploded.** So far, that growth has outstripped the discovery of protein-coding genes by a factor of five, and shows no signs of slowing." [emphasis theirs p. 214] In the year 2000, 94 non-coding RNAs were discovered. Since then, these elements previously called "junk DNA" have exploded in number to 130,629. [p. 215]

In a section entitled "Not junk", the *Nature* commentary declares: "Thanks in large part to the HGP, it is now appreciated that the majority of functional sequences in the human genome do not encode proteins. Rather, elements such as long non-coding RNAs, promoters, enhancers and countless gene-regulatory motifs work together to bring the genome to life." [p. 214] A lot of interest in these non-coding sequences comes from their connection to human diseases. [p. 214]

It was a sign of the times when recently an article appeared in *Nature* which reported that the deletion of a lengthy chunk of long non-coding RNA (copied from DNA) resulted in a complex congenital disease. This piece of lncRNA involved 27,000 to 63,000 nucleotides lost from a non-coding region in chromosome 2. It is more evident than ever that non-coding DNA is very important to the development and health of people. The authors of the study conclude: "our findings provide a conceptual framework for Mendelian diseases that extends beyond the involvement of coding genes and their regulatory sequences to include long non-coding transcripts acting on the genes themselves." [Lila Allou *et al.* 2021. *Nature* 592: 93-98 see p. 97]

These discoveries demonstrate how complex our genome is and how inadequate evolutionary pronouncements are which ignore our very coordinated genetic control systems. We expect more insights on our DNA in the days to come.





Squirrel Wonders and the Failure of Evolution to Explain Them

Continued from page 1

limb to another limb of the same tree, or even to other trees. They are one of the few mammals, aside from primates, that have color vision (Steele and Koprowski, 2001, p. 7).

Their excellent sense of touch uses the vibrissae (whisker-like hairs) on their strong flexible limbs as well as their heads. This system allows then to navigate telephone wires with ease, even while running on a wire almost as rapidly as they run on the ground.

Their tail is central to maintain balance on telephone wires high up the ground as well as in trees. Its function is similar to how a tightrope walker uses a pole to balance. They can also use their long tail, which is 40 percent of their body length, to protect their face and body from dogs, raptors, and other predators.

The blood vessels in the tail serve as an efficient thermoregulation system, opening blood circulation to the tail to cool the squirrel, and closing it to retain heat. Raising their tail over their body affords them the ability to enjoy the cool shade it provides. It also serves as a warm blanket that greatly helps to keep them warm during cold winter nights. Lastly, their tail is critical in communicating to other squirrels and potential predators (Steele and Koprowski, 2001, pp. 7, 13, 122, 124) .

Their Diet

Squirrels are herbivorous, subsisting on seeds and nuts, but some will eat insects and even very small vertebrates (Steele and Koprowski, 2001, pp. 38-40, 42, 44-47). They have large incisor teeth designed to crack open their diet of walnut, acorn, hickory and other nuts. Their constant gnawing helps them to keep their teeth razor sharp. Both tree and ground squirrels live in the same area yearround, including the cold winters. A motivation to write this paper is to understand how squirrels survive the ferocious winters where I live. Ground squirrels live on, or in the ground, and not in trees, and hibernate during the winter. Their heart rate and breathing rate slows down greatly and their body

temperature falls below zero in preparation for hibernation.

In contrast, gray tree squirrels rely on sheltered nests made from twigs and leaves, or dens in trees like woodpeckers, to sleep. In the winter they sleep in their nest or den and rely on fat reserves, and stored food to survive the long, cold winters (Cheevers, 2020). Also, in preparing for winter, they maximize their food consumption and body mass. They venture out during the morning and evening only if their food supply is low. They prepare for the winter by storing acorns and other nuts, berries, and tree bark in shallow holes near the trees where their nest is located. Squirrels use spatial memory to locate stored food, and often bury their food near landmarks to aid them in remembering where they stored it (Jacobs and Liman, 1991).

Evidence for Squirrel Evolution

Evolutionists believe that squirrels evolved about 36 million years ago from some hypothetical "more primitive rodent" (Thorington and Ferrell, 2006, p. 23). Previously, the earliest squirrel fossil evidence was found in western North America Darwin-dated to about 36 million years ago. A nearly complete skeleton was discovered in 1975 which "is surprisingly like that of a modern tree squirrel" (Thorington, and Ferrell, 2006, p. 23). The skeleton of the find, determined to be a *D. jefferson*i breed squirrel, was "discovered in early Oligocene deposits of Wyoming, [and] represents what may be the oldest fossil squirrel known… Except for minor differences in joint construction, the skeleton is strikingly similar to that of Sciurusniger, the living fox squirrel. It differs from extant ground squirrels in the more gracile proportions of its long bones and asymmetry of foot construction. This early member of the squirrel family was clearly an arboreal squirrel, with morphology, and presumably habits, very similar to those of extant Sciurinae." (Emry and Thorington, 1982). The bones that were examined were judged to be "identical" to modern squirrels (Emry and Thorington, 1982, pp. 9, 10, 19, 20).

The newest discovery after 1975 was a squirrel-like creature from China Darwin-dated over 200 million years old. The fossils were discovered by private collectors and amateur paleontologists in the fertile fossil province of Liaoning (Choi, 2014). The phylogeny [evolutionary relationship] of the fossils found "remains unsolved and has generated contentious views on the origin and earliest evolution of mammals." (Shundong *et al.*, 2014). As two of the leading experts of squirrels observed, "biologists consider tree squirrels to be living fossils because they remain virtually indistinguishable from European and North American specimens that lived more than 5 million years ago." (Steele and Koprowski, 2001, pp. 11-12). Squirrels are only one of hundreds of examples of living fossils (Eldredge and Stanley, 2012).

Many examples of variations within the genesis kind exist, such as documented by Steele and Koprowski (2001, pp. 102-104), but I have been unable to locate any evidence for the evolution of squirrels from a non-squirrel. In short, the origins concern is not of variations within the genesis kind, but the evolution of the first squirrel from a non-squirrel. From what is known, the first squirrel was very close to identical to modern squirrels. And if a local squirrel is making off with seed from your bird feeder, just reflect that they are all wonderful creations!

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Invention:
A new idea makes it work

Continued from page 1

Of course, the events in Canada were not the beginning of the story. Marconi had worked on this invention for close to a decade. What was it that made this young man successful? The fact is that he had an idea and others did not. Thus, in a biography of Marconi we read: "What set Marconi apart from the rest was that he saw wireless communication in his mind's eye, quite literally as telegraphy without wires……. It was Marconi who made the leap from Hertz's lab experiments to practical wireless telegraphy using electromagnetic waves as the medium of communication. This was his original contribution."[1] All the equipment pieces were available, but Marconi had the idea to put them together to produce a radically new invention.

An invention is a new kind of object which works to accomplish a task and which requires particular knowledge to develop. Moreover, an invention is something in which the various parts must work together to accomplish the desired specific task. For example, according to Douglas Axe: "Ordinary physical causes seem adequate for explaining things that aren't task oriented (things like atoms and stars and tornadoes), but our design intuition tells us those causes can't explain [things that work]."[2] Furthermore in living organisms "[E]ach new form of life amounts to a stunning new invention, and since the hallmark of invention is functional coherence [all parts working together] – which accidental causes can't explain – we rightly see each form as a distinct masterpiece."[3]

In the same way as Marconi conceived of radio communication, each molecular machine in living cells (and entire life forms) represents a new invention. The thing that makes these machines (and organisms) work is the idea of how to assemble the parts to produce a specific function. Here we see the work of God, the incredible designer!

Thus, some scientists point out that molecular machines and many other biological features could not evolve but would in fact have to appear complete if they were to function at all. Natural selection, they point out, cannot select for something that does not work. It is evident that irreducibly complex features must have been designed. The bacterial flagellum is the most famous example of irreducible complexity.

Evolutionists reply that co-option shows that irreducible complexity is a false argument. We have all heard arguments concerning the co-option of a Type 3 Secretion System (T3SS) in the development the bacterial flagellum. (The T3SS is a tiny syringe used by some bacteria to inject damaging compounds into eukaryotic cells. The superficial appearance of the interior part of the bacterial flagellum to the T3SS, led to the co-option arguments.)

In an essay on co-option, Deborah McLennan points out that the process of evolution can be speeded up if "characters that had evolved for one reason changed their function at a later time with little to no concurrent structural modification, at least initially. In other words, traits that had evolved under one set of conditions were co-opted to serve a different function under a second set of conditions."[4]

This commentator emphasizes that the co-option process is blind, with no objective or purpose. Thus, she declares: "The only difference between human and evolutionary co-option is that we purposefully change an object's function, while evolution simply takes advantage of an opportunity with no direction, purpose, or forethought." But there is a caveat. McLennan admits: "we may be able to answer the 'why' of evolution for many genetic co-option events, but we have only an incomplete picture of 'how' – for the moment."[5]

The evolutionary speculations about chance processes do not make sense. Our understanding of the process of invention is that it involves the conscious assembly of parts for a specific new function. The evolutionary idea that a cell, with no direction, purpose or forethought could successfully exploit something for a new function, lacks logical consistency. Only design, the purposeful assembling of a complete feature in the cell all at the same time, can explain irreducibly complex molecular machines and other parts of the cell, tissues, organs and body plans.

When we consider the purpose and planning evident among living creatures, it is important that we reflect on the source of these wonders!

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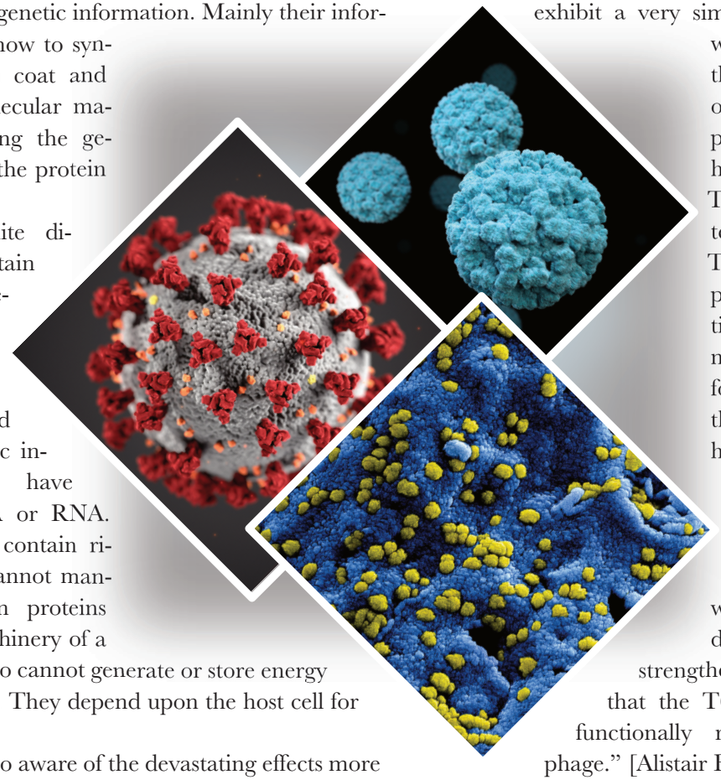
1. Marc Raboy. 2016. *Marconi*. pp. 863 See p. 52
2. Douglas Axe. 2016.*Undeniable: How Biology Confirms our Intuition that Life is Designed*. pp. 300. See p. 87
3. Axe p. 193
4. Deborah McLennan. 2008. The Concept of Co-option: Why Evolution Often Looks Miraculous. *Evo Edu Outreach*. Vol. 1: 247-258. See p. 247
5. McLennan p. 251.
6. Scientists have now decided that the T3SS never was co-opted by the bacterial flagellum. See http://dx.doi.org/10.1098/rstb.2015.0020

Viruses: In the News a Lot

There is no doubt that we are all tired of hearing about viruses! However, they actually do demonstrate some interesting features when we look at them more closely. These submicroscopic particles can reproduce themselves only inside a living cell. All life forms are susceptible to attack by at least one kind of virus. Basically, a virus consists of a protective protein coat with genetic information (RNA or DNA) enclosed inside. In that viruses commandeer the life processes of a cell which they have invaded, they tend not to need a lot of genetic information. Mainly their information deals with how to synthesize the protein coat and any associated molecular machines for packaging the genetic material into the protein capsid (coat).



Viruses are quite diverse: some contain RNA for their genetic information, others have DNA. Some exhibit single stranded molecules of genetic information, others have double sided DNA or RNA. No known viruses contain ribosomes, so they cannot manufacture their own proteins apart from the machinery of a host cell. Viruses also cannot generate or store energy in the form of ATP. They depend upon the host cell for that as well.

We are all only too aware of the devastating effects more common viruses can have on their victims. On their protein capsid exterior, viruses need a very specifically shaped protein which is able to connect with a specific protein receptor on a victim's cell surface. The viruses also require a very specific means of gaining access to the cell once they has attached to the surface.

One of the most interesting cases of a means to access the inside of a victim cell, is that of the bacteriophage. Those look like miniature spaceships – an icosahedral head with a projecting tail and stabilizing devices like the kick stand of a bicycle. Anyway, the virus settles tail end down onto a suitable bacterial cell and stabilizes itself with the landing gear. The virus then punches a hole in the bacterial wall with "exquisite specificity and efficacy." The action resembles a spring-loaded spear gun. It happens like this. The tail is armed with two concentric tubes. The outer one contracts and the inner one is thrust with great force into a bacterial host cell. The DNA inside the virus head, is then shot under pressure into the cell.

The wonder of all this is that some living bacteria exhibit a very similar system to the phage weapon. The bacteria are themselves able to attack other bacteria or animals or plants. These bacteria exhibit what is called the T6SS (type 6 secretion system). Armed with the T6SS, a bacterium too punches a hole in the victim's cell wall or plasma membrane, also with great force. Similarities between the two weapon systems have not escaped the notice of biologists. But how did a virus (non-living) and a bacterium (living) come to exhibit so similar a weapon? An article in *Nature* declared: "our findings strengthen the existing hypothesis that the T6SS is evolutionarily and functionally related to the bacteriophage." [Alistair B. Russell *et al.* 2011. *Nature* 475: 343-347 See p. 346.] In other words, the virus and the bacterium share a common evolutionary history.

A number of other evolutionary scenarios can be found in the scientific literature. In general, the speculation is that a virus and a bacterium shared a common ancestor or a protein which led to development of the common weapon design. The problems with trying to explain such a process are mind boggling. Have they never considered that God conferred that design on two totally unrelated biological entities?

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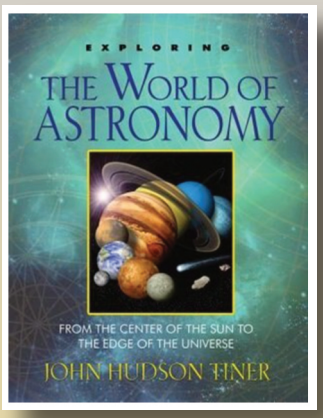

This is an outstanding book that is great for ages 10-14. The book emphasizes many features in space which can be observed with telescopes. At the end of each chapter is an "explore more" section with interesting activities suggested. The book presents new and practical information for exploring our solar system and space beyond.

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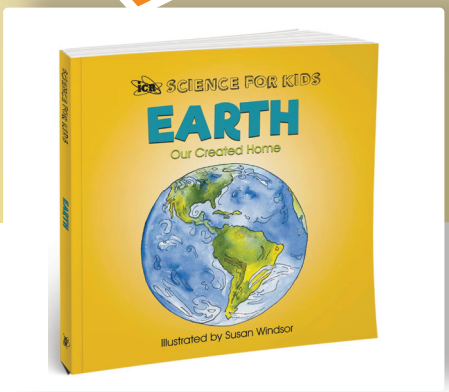

ICR Authors

Earth: Our Created Home

This new book for the younger set (ages kindergarten to grade five), introduces the reader to an amazing number of issues connected with our earth, its past history, present concerns and future. And the text is enhanced by beautiful water colour illustrations. Definitely a positive learning experience!

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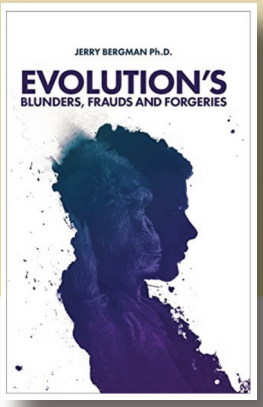

Jerry Bergman

Evolution's Blunders, Frauds and Forgeries

This account of how so many errors, or just plain deceptions (as with Piltdown Man) were supported and promoted by the scientific community, is certainly enlightening. It turns out that there are an astonishing number of such instances to discuss. This book is fascinating to read and encourages careful examination of current scientific claims.

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