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Common Sense

Do you remember the tale of the emperor’s new clothes? Remember how the emperor went along with the ludicrous idea that he was wearing clothes when he was actually naked? In the story, he seems to have ditched common sense along with his apparel. A young child is the only one to tell it like it really is—“Look, he isn’t wearing any clothes!”

It makes me think of the children I meet through ICR events, church, friends, or family. The children are often quick to point out the silliness of impractical thinking. They’re not worried about what others might think, and they don’t put a lot of stock in what someone else may say—even when those people have initials after their name. When a teacher tells children that humans came from ape-like animals, they usually wrinkle their noses and wait for the punch line of the joke. They laugh. They point out the ridiculousness of the suggestion when they are first introduced to evolution.

But somewhere along the way, these children grow up and begin to think like adults. Why do so many adults ditch obvious, commonsense ideas in favor of fairy tales? These days, a majority of them accept the idea that we evolved from an ape-like ancestor—that we came from something other than humans. They lose their common sense and, with a straight face, embrace nonsense.

I’m so glad we have scientists like Dr. Jeffrey Tomkins to provide research data so



adults can confidently acknowledge truth. In “Human-Chimp DNA Comparison,” he points out the naked fallacies of evolutionary thinking (pages 5-8). He reminds us that “all evolutionists have a presupposition that we all share a common ancestor...that all life is connected through evolution.” He not only provides evidence that reveals the fallacies of evolution, but he offers common sense in its place.

How do experts accept as fact that rock layers like those in Palo Duro Canyon were deposited over millions of years? Evidence doesn’t support the evolutionary presupposition. Geologist Dr. Tim Clarey says, “The lack of any visible erosion is strong evidence that there were not millions of years....We see a pattern—much like we see

in Grand Canyon—that is best explained by continuous activity” (“Palo Duro Canyon Rocks Showcase Genesis Flood,” page 10). He says, “Secular scientists claim these are deposits from rivers, but a receding mega-flood explanation better fits the broad extent of the Ogallala” and that the formation “would have required high-energy conditions over a huge area.” Dr. Clarey combines his geological expertise with a good dose of common sense.

Nuclear physicist Dr. Vernon Cupps also demonstrates how the biblical model more accurately explains “observed radiohalos and their frequency of occurrence in the earth’s rock layers” than the evolutionary model (“Radiohalos: Nature’s Tiny Mysteries,” pages 11-13). Common sense leads us to look at the evidence before immediately accepting evolution’s presuppositions.

So, how do we get back to common sense and that childlike innocence that tells it like it is? Just like the child in “The Emperor’s New Clothes,” we mustn’t let a fear of people keep us from acknowledging the truth. Psalm 8:2 tells us that “out of the mouth of babes and nursing infants [God has] ordained strength.” Let’s not allow the popularity of evolutionary thought to cause us to ignore facts that even a child can recognize. If we’re willing to follow the evidence where it leads, we’ll see the naked truth for ourselves.

Jayme Durant

Jayme Durant
EXECUTIVE EDITOR

Human-Chimp DNA Comparison

Jeff Tomkins: Interview with a Geneticist

article highlights

- Dr. Jeffrey Tomkins' first assignment at ICR was studying the human-chimp DNA comparison issue.
- He found that the long-touted 98 to 99% human-chimp DNA similarity is actually closer to 85%—about a tenfold difference from the original evolutionary estimate.
- Dr. Tomkins also debunked evolutionists' human chromosome 2 fusion claims, showing the supposed site of fusion is in the middle of a gene and is highly functional rather than a genetic scar from an evolutionary past.

Dr. Jeffrey P. Tomkins is Director of Life Sciences at the Institute for Creation Research. He recently spent time talking about his work with ICR Science Writer Brian Thomas.

Brian: I'm joined by Dr. Jeff Tomkins, who's been a geneticist at ICR for over nine

years. What motivates you to do this type of intense research?

Dr. Tomkins: My motivation started when I arrived here and was given the task of researching the human-chimpanzee similarity issue because people ask about this in churches. They hear the claim that humans and chimps are 98 to 99% similar. People want to know if that's true. Before working here, I'd not investigated that issue. I ran a genome center for over five years and investigated various plants and animals but never the human-chimpanzee comparison. I went into it with an open mind and began reading all the literature on the subject—this started about eight years ago. I looked at the top six scientific publications that proposed a 98 to 99% DNA similarity between modern humans and modern chimpanzees.

Brian: A 98 to 99% genetic similarity between modern humans and modern chimps—why is that important?

Dr. Tomkins: It's very important to theoretical evolutionists. The 98 to 99% claim is a theory—it's speculative. They

need a similarity that close to have humans and chimps evolve in the alleged three- to six-million-year timespan from a supposed human-chimpanzee common ancestor. Their statistical models need that 98 to 99% similarity.

Brian: What did you find in the literature?

Dr. Tomkins: The first thing I noticed when I began reading these articles was that researchers were throwing out a lot of data. They were cherry-picking the areas of DNA between humans and chimps that were highly similar and throwing out areas, including areas that would not line up properly. Areas that don't line up are dissimilar. When I researched the data, I was coming up with DNA similarities between 81 to 86% when I included the dissimilar data. I published a paper on this.¹ This is way outside the realm of theoretical evolution.

Brian: What should the evolutionary community say about this?

Dr. Tomkins: They have reacted to a lot of my research since that first paper. There's a lot of DNA sequence data that is publicly available in databases. I began working with the data myself, and over a number of years I refined my techniques. I used an algorithm developed by evolutionists that turned out to be a bad algorithm—so there's been a lot of trial and error. But I finally got to the point where I published a paper in 2016.² It was the most comprehensive study I've done yet, and I looked at all 101 data sets that went into originally building the chimpanzee genome.

I sampled 25,000 sequences at random from each of the data sets and then began analyzing and comparing them to human. Over half of the



data sets were extremely similar to human, and the other half were extremely dissimilar to human. It appeared the initial chimpanzee genome was contaminated with human DNA, which is a huge problem in genomics.

There's a number of studies by secular researchers showing that many public DNA databases, from bacteria to fish, have significant levels of human contamination. Human DNA literally gets into the samples. Contamination is a major issue. Hu-

When I researched the data, I was coming up with DNA similarities between 81 to 86%....This is way outside the realm of theoretical evolution.

man DNA comes from researchers' fingers, coughing, sneezing, etc., and it gets into the samples. Now researchers are taking greater steps to alleviate that problem. This was especially prevalent back in the earliest phases of genome projects, when the chimpanzee was sequenced.

Brian: Wouldn't some of the human

DNA that made it into the raw data affect the results of any comparison analyses?

Dr. Tomkins: It has a huge effect because the chimpanzee genome is stitched together using the human genome as a scaffold. It's like a puzzle—researchers used the human DNA “picture on the box” to assemble the chimp genome. The chimp DNA sequences used were all about 750 bases long. Not only was the chimp genome built using the human genome as a guide, it also has hu-

man DNA contamination in it, so it showed a lot of similarity from the contamination.

Brian: Even with those factors in place that skewed the data to a more human genome, is it closer to the 98% or the 86% maximum you observed?

Dr. Tomkins: It's difficult to determine because it is a flawed product. I based my research on human-chimp similarity on the half of the data sets that appear to have much *less* human DNA. Based on my work, I'm seeing not more than an 85% DNA similarity of chimpanzee to human, and that's a maximum. It's probably less than that.

Brian: If that's anywhere close, then there's no feasible story to tell of how a chimp-like creature could've evolved into a human-like creature over three or even six million years.

Dr. Tomkins: Absolutely. There've been some recent biomedical researchers showing that any two human genomes could be 4.5% different from each other. We used to think that human genomes were only 99.9%

similar to each other. But if we take the structural differences into account, there's a 4.5% difference between humans. How then can we be 99% similar to a chimp? It's totally nonsense.

Brian: It sounds like a game-changer. Let me back up. You used to run a genome lab. What was life like back then?

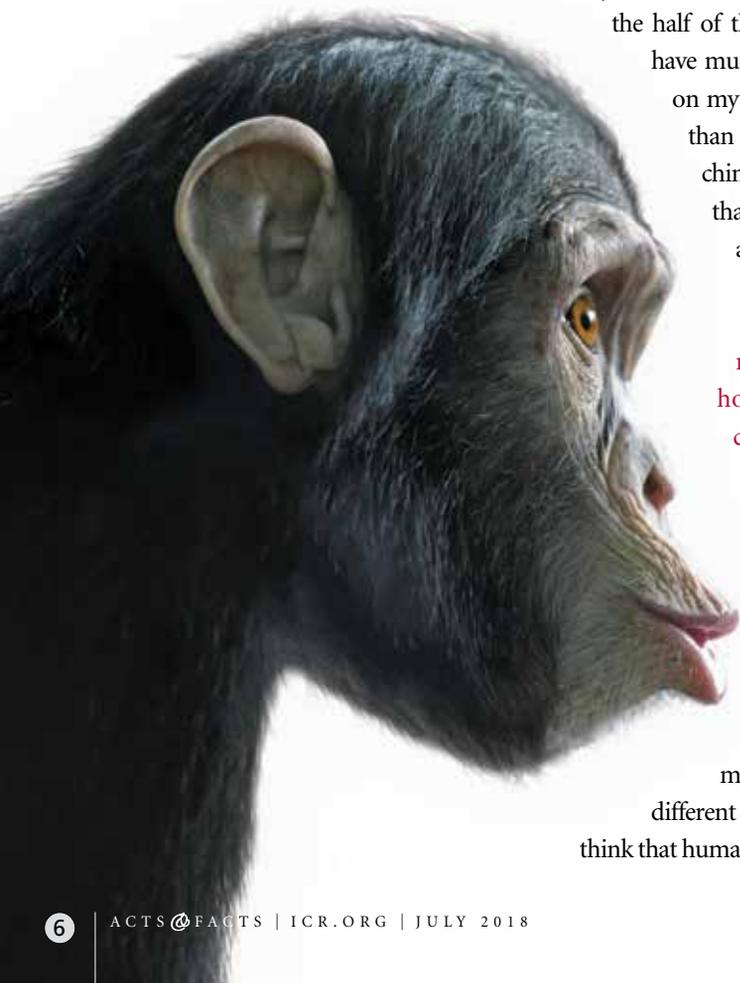
Dr. Tomkins: In our lab at Clemson University, we were mainly interested in exploring new genomes. We'd explore the genomes of some strange creatures like fire ants, shrimp, oysters, ticks, corn, peaches, soy beans, etc. I looked at a lot of plant and animal genomes, and we'd map out the genomes and sequence their DNA. We'd run a special type of DNA sequencing where we'd sequence only the genes by extracting and sequencing the RNA, and also sequence the genomic DNA as well. When we'd take these sequences and compare them to other plants and animals, we'd see a small core set of genes shared between different plants or animals, but then you'd have a whole lot of other genes that were unique to each type of organism that you couldn't find any match for in databases. So, things were not matching up with evolution's predictions and models. But things were matching up with what a Divine Engineer would use. The Bible talks about creatures created after their own kind. There'd be repeated code just like a computer programmer would use to perform basic functions, and we'd see unique code that was creature-specific. In other words, we saw unique genomes specific to a created kind, just as predicted by the Bible.

Brian: This was a secular institution?

Dr. Tomkins: Yes, at Clemson University, and we had a lot of federal funding and worked on a lot of interesting collaborative projects with researchers at other universities. It was a lot of fun.

Brian: What is the next stage in your work on the human-chimp research?

Dr. Tomkins: I'm still working on it. There is a new version of the chimp genome. I'm researching how accurate it is. I've also been looking into the DNA sequences that



were used to build it. They are called *contigs*, which are stitched-together, long regions of DNA that were not assembled using human DNA as a guide. I'm basically seeing the same very low level of similarity that I've seen before. It appears my new research is validating what I've previously discovered. There's more work to be done to finish this project.

Brian: You've done eight years of research on the human-chimp genome comparison. How should Christians feel about this area of research? Put yourself in the mind of a pastor who has no idea about genetics but for years has heard about the 99% similarity. Who should he believe, and why?

Dr. Tomkins: I have the hard data to show what I'm saying. I've published that in papers that are open to the public. The data sets I've used are available to the public. The computer programs I've written are on the internet and open to the public. The algorithms are provided by the federal government and the National Institutes of Health, and those are open to the public. Nothing is hidden—anyone can repeat my research and see for themselves. I'm not getting a lot of kickback from evolutionists because they know what I'm doing is totally valid. And they know all my methods are out there and can be repeated, and they'll get the same results.

I'm getting a lot of silence from most professional academics. There are a few evolutionary-evangelist types who don't do real research. They've been complaining about my research—and most of what they've said is totally invalid.

Brian: What about the people in the pew who feel browbeaten and say, "I guess the Bible says I came from Adam, but I don't know, maybe Adam came from apes because we're so genetically similar." How would you respond to that type of thinking?

Dr. Tomkins: When I talk to people in churches, I basically explain what I'm telling you right now, and I try to do it in terms most people can understand. And people are relieved to know there are scientists out there taking the data evolutionists have pro-

duced and looking at it objectively and finding results that contradict evolution.

Brian: Give us a nutshell on your spiritual journey. Did you always believe in creation?

Dr. Tomkins: I was raised in a home that was secular-evolution based. Although we went to a denominational church, my father was an evolutionist and a big fan of Carl Sagan. After high school, I went to Washington State University and had a Christian roommate who shared the gospel with me, and I became a Christian. However, the issue of origins was confusing, and I was being bombarded with evolution by my professors. I initially bought a book where the author tried to combine evolution with the Bible, but it was unconvincing. Then I

The computer programs I've written are on the internet and open to the public. The algorithms are provided by the federal government and the National Institutes of Health, and those are open to the public. Nothing is hidden—anyone can repeat my research and see for themselves.

found a book called *Scientific Creationism* by Dr. Henry M. Morris, and it all meshed—science fit the Bible.³ There were no contradictions, and the science was totally solid. I saw there was no hard scientific evidence for evolution and that the facts of science lined up well with the Scriptures. I was about 22 years old at the time, and I quickly became a creationist right after becoming a Christian, thanks to ICR and Henry Morris.

Brian: Did you find it difficult to get your degrees at a secular college?

Dr. Tomkins: My master's degree was challenging because it was my first experience in graduate school and I had a tough advisor. But God was teaching me how to do scientific research. When I got my Ph.D. in genetics at Clemson, I was really blessed because I had a professor who was a strong Christian, and I'd been well-trained during my master's degree program. I was doing work in quantitative genetics—more of

a classical-type field. I had good graduate committee members who were very helpful, and I kept a low profile regarding my creation science beliefs.

Brian: Did you struggle at all in that secular work environment, maintaining a low profile?

Dr. Tomkins: When I was working as a faculty member in the Department of Genetics and Biochemistry at Clemson and running a genome center, I had to keep a low profile. Fortunately, I was in a technology-based field doing applied genetics research and wasn't deeply involved in theoretical evolution. It was very basic research—how is this genome put together, how is it structured? How is it similar to other genomes, how is it different?

Brian: Then you moved to ICR. What precipitated your switch?

Dr. Tomkins: I'd been communicating with scientists at ICR since the late 1990s. We had a genome conference every year in San Diego, where ICR used to be located, and I would drop in to visit. I kept up that relationship when they moved to Dallas. ICR had a research initiative called the Gene Project—a DNA analysis project. I had consulted on this for several years. Then I felt it was a good time to make the move out of secular academics since ICR needed more geneticists to be involved. Most of my grants had finished up, and it was a good point to end things at Clemson and make the move to ICR. Plus, I was limited—I couldn't say anything bad about evolution or promote creation science. I felt the need to use my talents and what remained of my life to further the gospel of Jesus Christ and creation science.

Brian: I for one am thrilled that you made that switch, and it's been a pleasure and a joy to know and work with you and to see the amazing fruits of your research. Anything else you'd like to talk about?

Dr. Tomkins: I'd like to talk about chromosome fusion.

Brian: And this is a subset of the chimp-human DNA study?

Dr. Tomkins: Yes. When I first started working for ICR, we had some visitors. One mentioned that an evolution-promoting book called *Relics of Eden* discussed something called chromosome fusion, and it negatively affected their son's faith.

Apes have 48 chromosomes, but humans have 46. So, evolutionists have a discrepancy in chromosome numbers and

site's sequence is less than 800 bases. I also noticed this so-called fusion sequence was inside a gene, and I published this research in 2013, with a follow-up paper with more research in 2017.^{4,5} Sure enough, the supposed fusion sequence is inside a gene, and it's a promoter, or a switch inside a gene. It debunks the concept of fusion. I also found a number of proteins that bind to turn on this switch, along with RNA transcripts being produced from this region. So, the evidence is overwhelming—it's a promoter inside a gene. In another, unpublished project, I found telomere-like sequences all over the human genome acting as genetic switches.

Brian: So, they're not genetic junk or scars.

Dr. Tomkins: In a chromosome fu-

lutionary verbiage.

Brian: Your research has done some heavy lifting in the debunking of these icons of evolution. Can you provide some evidence for creation? You want the church to know that we're designed, God made us. What would you say to that?

Dr. Tomkins: Look at the complexity of the genome and all the different codes that operate within it. We not only have the basic genetic code, but we also have many different codes just like a computer system has different kinds of programming languages. The genome is the same way—we have all these different codes in DNA, RNA, and proteins operating together, and they are so complex. They go way beyond anything humans could create. Even just within the DNA, you have code that goes forward and backward, genes that overlap other genes. Only a divine Creator could engineer something this complex.

Brian: It would be like reading a book and then turning that book over and having it read something else backward and upside-down. Thank you, Dr. Tomkins, for switching over from your secular work to answer some of the toughest questions the church faces when they try to figure out “Did I really come from Adam?” What a joy to know your work says, “Yes, yes, we did come from Adam. Our DNA is unique. We are human!” I appreciate all you've done, and I hope we can do more to notify others about your work. ✍️

References

1. Tomkins, J. and J. Bergman. 2012. Genomic monkey business—estimates of nearly identical human-chimp DNA similarity re-evaluated using omitted data. *Journal of Creation*. 26 (1): 94-100.
2. Tomkins, J. P. 2016. Analysis of 101 Chimpanzee Trace Read Data Sets: Assessment of Their Overall Similarity to Human and Possible Contamination With Human DNA. *Answers Research Journal*. 9: 294-298.
3. Morris, H. M. 1985. *Scientific Creationism*. Green Forest, AR: Master Books.
4. Tomkins, J. P. 2013. Alleged Human Chromosome 2 “Fusion Site” Encodes an Active DNA Binding Domain Inside a Complex and Highly Expressed Gene—Negating Fusion. *Answers Research Journal*. 6: 367-375.
5. Tomkins, J. P. 2017. Debunking the Debunkers: A Response to Criticism and Obfuscation Regarding Refutation of the Human Chromosome 2 Fusion. *Answers Research Journal*. 10: 45-54.

We not only have the basic genetic code, but we also have many different codes just like a computer system has different kinds of programming languages. The genome is the same way—we have all these different codes in DNA, RNA, and proteins operating together, and they are so complex. They go way beyond anything humans could create.

need a solution that somehow makes us more closely related genetically. They believe two ape chromosomes fused end-to-end and formed a single chromosome—human chromosome 2. They actually found a sequence that appeared to support that idea. There's a stretch of DNA with some telomere-like sequences (like the ones found at the ends of chromosomes) in the middle of chromosome 2. They called this the “fusion site.”

So, I looked at the alleged fusion site more closely to see how strong the evidence really was. It turns out these telomere sequences are quite degraded, and the signature is quite small if two telomeres had actually fused. Human telomeres are 5,000 to 15,000 bases long, so if you had two chromosomes fuse you should have something 10,000 to 30,000 bases long. But the fusion

sion, there should be two genetic scars, and you should have a fossil centromere in addition to the fusion site. As it turns out, the so-called fossil centromere is also in the middle of a gene, a huge protein-coding gene! This alleged fossil would be impossible to form in a fusion. So, fusion is debunked.⁵

Brian: To wrap up, how would you describe the way an evolutionist approaches these DNA questions?

Dr. Tomkins: All evolutionists have a presupposition that we all share a common ancestor with other living things. Everything we see today supposedly descended from an ancestral cell. They have a presupposition that all life is connected through evolution. That's how they approach everything. They are saying, “What does the data look like in light of evolution?” Even all the scientific terms they use are cloaked in evo-

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Palo Duro Canyon Rocks Showcase Genesis Flood

ICR scientists recently led field trips through Palo Duro Canyon near Amarillo, Texas, pointing out many geological features that show clear evidence of the global Flood. The walls of the canyon display over 700 feet of Flood strata.

Palo Duro Canyon is the second-largest in the U.S., behind only Grand Canyon. A bright orange siltstone, the Permian Quartermaster Formation, forms the base of the canyon. Secular scientists claim this layer is about 250 million years old. On top of this are the multi-colored Triassic Tecovas Formation (shale) and Triassic Trujillo Formation (sandstone), both claimed to be about 210 million years old. These units were deposited just prior to the layers containing most of the dinosaurs. They contain fossils of phytosaurs (large crocodile-like reptiles) and amphibians up to seven feet in length.¹

The rocks show no evidence of the supposed 40 million years of missing time between the Quartermaster and the overlying Tecovas. What are observed are flat-lying rocks upon flat-lying rocks for tens of miles in all directions. These sedimentary strata look like they were deposited layer after layer with no time gaps in between.

The cap rock that makes the upper rim of Palo Duro Canyon is the Miocene-Pliocene Ogallala Formation. Composed of a tan cliff-forming sandstone, some siltstone, and a basal conglomerate layer,¹ this uppermost unit is thought by evolutionists to have been deposited between 4 to 10 million years ago.² Evolutionary geologists have recognized this uniformitarian paradox, stating:

You will note a lot of time is missing between the Trujillo and the Ogallala. Either the rocks representing about 200 million years of time were eroded away, or they were never deposited; whatever the case, a great unconformity is represented by the mere line between the multi-colored upper beds of the Trujillo and the lower tan beds of the Ogallala.³

The lack of any visible erosion is strong evidence that there were not millions of years between the deposition of the Triassic

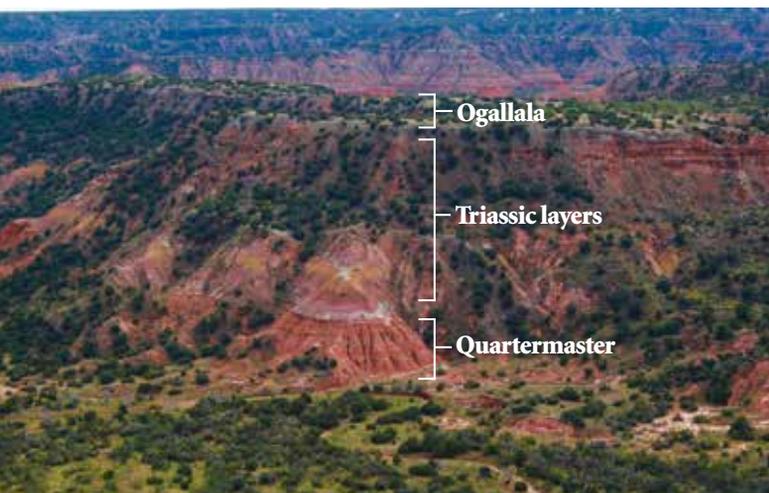


Image credit: Will Perry

article highlights

- Palo Duro Canyon near Amarillo, Texas, is second in size only to Grand Canyon in the U.S.
- Flat-lying rock layers stack on top of each other for many miles in all directions. They look like they were deposited with no time gaps in between.
- The Ogallala layer covers about 174,000 square miles across eight states. It's so evenly spread it would have required fast-moving water over a huge area.
- Palo Duro Canyon documents the rising and the receding stages of the Genesis Flood.

beds and the overlying Ogallala. Instead, we see a pattern—much like we see in Grand Canyon—that is best explained by continuous activity. The Ogallala is conformable to the underlying Trujillo all around the canyon rim, with no tilting of the underlying units and no erosional channels carved into the boundary surface.

The Ogallala covers about 174,000 square miles from Texas to South Dakota (Figure 1).⁴ While it is only 20 to 40 feet thick in the canyon, it increases to over 700 feet across much of the Great Plains. Igneous and metamorphic cobbles in the basal conglomerate of the Ogallala are sourced from the Rocky Mountains, hundreds of miles to the west.¹



Figure 1. The extent of the Ogallala Formation across the Great Plains region.

Secular scientists claim these are deposits from rivers, but a receding mega-flood explanation better fits the broad extent of the Ogallala. How else can a blanket sand layer spread across thousands of square miles with no evidence of river channelization? And localized post-Flood catastrophism cannot explain the massive extent of this deposit either, just like isolated regional processes cannot explain the huge deposit of the Whopper Sand in the deep Gulf of Mexico.⁵

The formation of the Ogallala would have required high-energy conditions over a huge area, similar to sheet-wash off a parking lot, to distribute the cobbles and sands so evenly across vast regions of the Great Plains. Visitors to Palo Duro Canyon can witness a vivid reminder of the rising and the receding stages of the Genesis Flood. ☁

References

1. Guy, D. E., ed. 2001. *The Story of Palo Duro Canyon*. Lubbock, TX: Texas Tech University Press.
2. Spearing, D. 1991. *Roadside Geology of Texas*. Missoula, MT: Mountain Press Publishing Company.
3. Ibid, 385.
4. Ogallala Aquifer Initiative 2016 Progress Report. United States Department of Agriculture.
5. Clarey, T. 2015. The Whopper Sand. *Acts & Facts*. 44 (3): 14.

Dr. Clarey is Research Associate at ICR and earned his Ph.D. in geology from Western Michigan University.



Radiohalos: Nature's Tiny Mysteries

article highlights

- Radiohalos are darkened areas in rock made by alpha-particle decay around bits of suspended mineral.
- At current decay rates, it would take nearly one billion years to form visible radiohalos.
- This time frame is too great to fit secular age estimations of the rock layers in which the radiohalos exist, so decay rates must have been substantially greater in the past.
- The biblical narrative best explains the radiohalos we see.

Radiohalos are minute darkened circular zones around tiny mineral inclusions that appear in microscopic cross-sections of rocks such as black mica and biotite (Figure 1). First reported in the 1880s, their origin was a mystery until the discovery of radioactivity. In 1907, John Joly² and Otto Mügge³ independently suggested the darkened areas of the minerals around the central inclusions—the halos—were due to the emission of alpha (α) particles from the included elements. However, radiohalos remained tiny mysteries until the pioneering work of Robert Gentry⁴⁻⁶ in the late 20th century and Andrew Snelling⁷⁻¹² and others in the early 21st century.

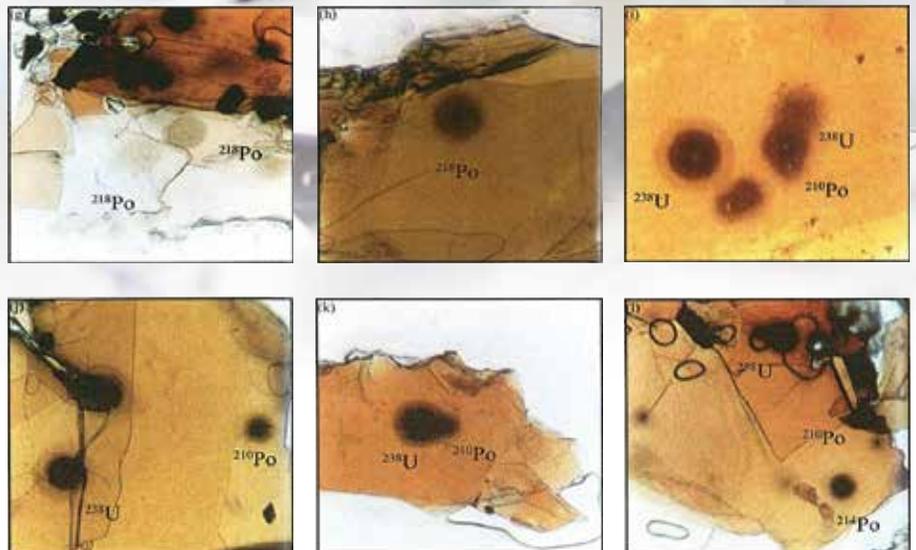


Figure 1. Some typical examples of different radiohalos found in granitic rocks, from volume 2 of the *Radioisotopes and the Age of the Earth (RATE)* study.¹

What Are Radiohalos?

Radiohalos result when enough charged particles, such as α particles (^4He , helium-4 nuclei), are transmitted through a material to cause damage by displacing the molecular structure of the material along the path of the charged particles. Out of the common radioactive decay emissions, α particles have the highest linear energy transfer to any material they pass through, because they are larger, have a higher electrical charge, and are more massive. This means they cause more damage over a shorter distance in a given material than either beta (β) or gamma (γ) radiation.

It takes many decays to produce a radiohalo. So, if ^{238}U (a uranium isotope) or ^{232}Th (a thorium isotope) becomes trapped by a microscopic radiocenter such as a zircon crystal within layers of biotite, it and its subsequent daughters will begin producing tracks in the surrounding biotite when the temperature of the biotite drops below its annealing (a process of heating and cooling) temperature of 150°C . The circular zone around the radiocenter does not begin to darken until approximately 500 million decays have occurred, and the circular zones become very dark around one billion decays. Each radioisotope in the ^{238}U and ^{232}Th decay chains emits α particles of different energies (Figure 2). Thus, each radioisotope forms a darkened circle with a different diameter, ranging from approximately $10\ \mu\text{m}$ to $40\ \mu\text{m}$ (μm = micrometer, or one millionth of a meter). This enables researchers to identify which isotope from the decay chain produced the observed radiohalo.

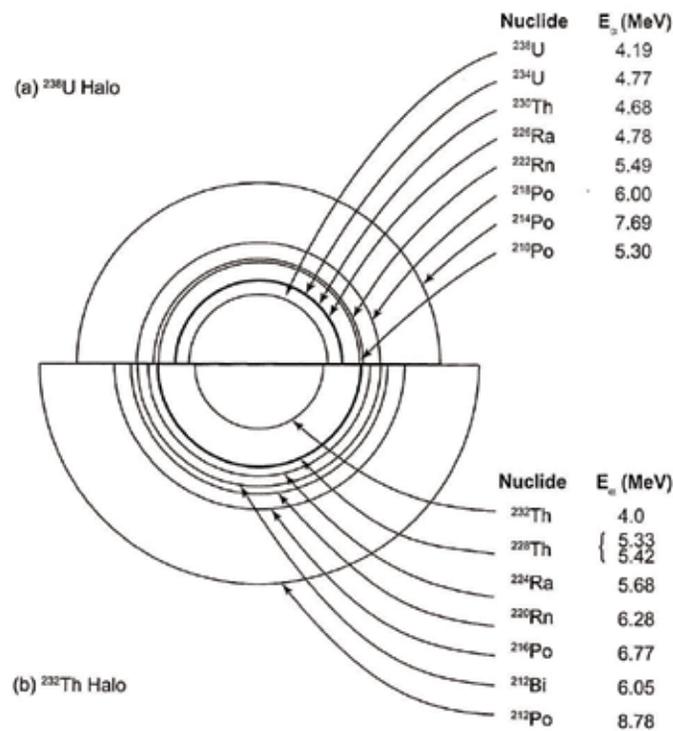


Figure 2. Schematic drawing of (a) a ^{238}U halo, and (b) a ^{232}Th halo, with radii proportional to the ranges of α particles in air. The nuclides responsible for the α particles and their energies are listed for the different halo rings.¹³

The Mystery Unraveled?

Are radiohalos simply a scientific curiosity, or do they actually have something interesting to tell us about our past? The existence of ^{238}U and ^{232}Th radiohalos would come as no great surprise to most geologists who embrace the secular paradigm for Earth's ages—until they attempt to reconcile their existence in rocks of the Tertiary and late Paleozoic-Mesozoic periods, as found by the Radioisotopes and the Age of the Earth (RATE) investigation.⁸

Forming visible ^{238}U radiohalos in small zircon crystals would require approximately 900 million years to generate 500 million ^{238}U alphas at today's decay rates. So, the reasonable conclusion is that if ^{238}U radiohalos require at least 500 million decays to generate a visible radiohalo, then either the granitic rocks of the Tertiary and late Paleozoic-Mesozoic eras have been substantially misdated, or there has been a significant increase in the decay rate of ^{238}U sometime in Earth's past. Neither of these options is very attractive to the secular scientific community because neither fits their dating model.

Next, we tackle a concomitant problem for the observed radiohalos in granitic rock minerals; i.e., how could the short-lived polonium isotopes near the end of the ^{238}U and ^{232}Th decay chains (Figure 2) form separate radiohalos from the parent isotopes? If the ^{238}U or ^{232}Th and their accompanying daughters simply stayed in place during the entire decay sequence, then one would expect to see a single, large (~40- μm diameter) radiohalo. This is not what either Robert Gentry or the authors of the RATE project observed (Figure 1). They in fact observed numerous isolated ^{210}Po , ^{218}Po , and ^{214}Po radiohalos (Table 1), especially in the Paleozoic, Mesozoic, and the late Precambrian-era rocks. What is necessary for isolated Po radiohalos to form?

- » There must be some type of isotropic flow of hydrothermal fluids capable of transporting the intermediary parent radioisotope ^{222}Rn (radon) and/or the Po isotopes to a new radiocenter spatially separated from the original ^{238}U parent radiocenter.
- » Radiocenters for the ^{222}Rn and Po radioisotopes must be present.
- » There must be transportation of ^{222}Rn and/or Po isotopes to radiocenter sites in sufficient amounts to enable the formation of radiohalos.

Conventional Age of Rock	Number of Rock Samples	Number of Radiohalos				
		^{218}Po	^{214}Po	^{210}Po	^{238}U	^{232}Th
Tertiary 1Ma–65Ma	8(400)	0	0	9	2	0
Paleozoic-Mesozoic 70Ma–490Ma	70(3,485)	426	1,350	15,847	11,092	286
Precambrian 600Ma–2,900Ma	31(1,510)	2	23	1,788	510	3
Metamorphic Rocks 100Ma–1,750Ma	21(1,051)	11	53	8,999	2,971	3

Table 1. A summary of the radiohalos found by the RATE investigation in granites from three divisions of geological time within the secular paradigm and from metamorphic rocks analyzed.¹⁴

- » Transportation of the ^{222}Rn and/or Po isotopes to radiocenter sites must occur in a time frame that accommodates their relatively short half-lives. This is a particularly thorny problem for the isolated ^{214}Po (with a half-life of 164 μsec) and ^{218}Po radiohalos (with a 3.1-minute half-life).
- » To produce a radiohalo, there must be a sufficient accumulation of Po isotopes in the radiocenter when the temperature drops below the annealing temperature of the mineral they are formed in.



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Andrew Snelling and Mark Armitage provide a more detailed model for this process in Appendix A of the RATE report.¹⁵ It should be noted that the exact details for transport of the ^{222}Rn and/or the various Po isotopes to new radiocenters can, at best, only be speculative. The fact that there are virtually no radiohalos in the Tertiary rock samples suggests that the so-called Tertiary rock experienced a significantly different environment from those of the Paleozoic, Mesozoic, and late Precambrian.

So, how would the mainstream science community explain these observations? The secular dating model requires intermittently large volumes of hydrothermal fluid to flow over the rocks in these sedimentary layers during each time period they represent. Heating the hydrothermal fluid to high temperatures would most likely create enough heat to anneal any prior existing radiation damage in the zircon crystals or the biotite layers. Therefore, the approximately 500 million decays of a Po isotope needed to produce any specific radiohalo would have to occur *during* the time frame represented by the rock layer itself. Most geologists would consider this a highly unlikely scenario due to the fact that such hydrothermal flows would disrupt the established sedimentary layers *below* the layer of interest. Such disruption is not observed on a massive scale.

At present decay rates, it would take the estimated amount of ^{238}U (1,000 ppm)¹⁶ within a 2- μm zircon crystal approximately 34 million years to generate the 500 million Po atoms necessary to produce a Po halo, assuming all the ^{238}U decay Po atoms of a specific type reach a single radiocenter. But, for example, if only 10% of the ^{218}Po atoms generated in the ^{238}U decay chain reached a radiocenter, then the production time would escalate to approximately 1.52 billion years.

How would a model based on the biblical narrative explain these observations? A model based on Genesis would view the sedimentary rock layers as representing stages of the great Flood

described in Genesis 7. At the beginning and during the Flood, accelerated volcanic activity would have brought large amounts of igneous rock, with accompanying hydrothermal fluids, up through the earth's crust. Early in the Flood, rock temperatures would have dropped below the annealing temperature of biotite, allowing the accumulation of ^{218}Po , ^{214}Po , and ^{210}Po into radiocenters via hydrothermal transport. The receding of the Flood and the shutting off of the fountains of the deep on day 150, during which no more significant hydrothermal transport of ^{238}U or ^{232}Th daughters occurred, would explain the lack of radiohalos in the so-called Tertiary layers. Since the Flood occurred over a period of about a year, this clearly implies that the decay rates of ^{238}U and

^{232}Th were accelerated by many orders of magnitude during this event, a conclusion drawn by the authors of ICR's RATE project in 2005.¹⁷

Clearly, the observed radiohalos and their frequency of occurrence in the earth's rock layers support a scenario based on the biblical model far better than they support the secularists' deep-time evolutionary model. ☞

References

1. Snelling, A. A. 2005. Radiohalos in Granites: Evidence for Accelerated Nuclear Decay. In *Radioisotopes and the Age of the Earth: Results of a Young-Earth Creationist Research Initiative*. L. Vardiman, A. A. Snelling, and E. F. Chaffin, eds. El Cajon, CA: Institute for Creation Research and Chino Valley, AZ: Creation Research Society, 120.
2. Joly, J. 1907. Pleochroic halos. *Philosophical Magazine*. 13 (75): 381-383.
3. Mügge, O. 1907. Radioaktivität als ursache der pleochroitischen höfe des cordierite. *Zentralbl. Mineralogie und Geologie*. 1907: 397-399.
4. Gentry, R. V. 1968. Fossil Alpha-Recoil Analysis of Certain Variant Radioactive Halos. *Science*. 160 (3833): 1228-1230.
5. Gentry, R. V. et al. 1976. Evidence for Primordial Superheavy Elements. *Physical Review Letters*. 37 (1): 11-15.
6. Gentry, R. V. 1986. *Creation's Tiny Mystery*. Knoxville, TN: Earth Science Associates.
7. Snelling, A. A. 2000. Polonium Radiohalos: Still "A Very Tiny Mystery." *Acts & Facts*. 29 (8).
8. Snelling, Radiohalos in Granites, 101-207.
9. Snelling, A. and M. Armitage. 2009. Radiohalos—A Tale of Three Granitic Plutons. *Answers in Depth*. 4: 114-138.
10. Snelling, A. A. 2012. Radiohalos—Solving the Mystery of the Missing Bullets, Part Three. *Answers Magazine*. 7 (4): 70-73.
11. Snelling, A. A. 2012. Radiohalos—The Mysterious Vanishing Bullets, Part Two. *Answers Magazine*. 7 (3): 70-74.
12. Snelling, A. A. 2012. Radiohalos—Mysterious Bullet Holes in Rocks, Part One. *Answers Magazine*. 7 (2): 70-73.
13. Snelling, Radiohalos in Granites, 104. Adapted from Gentry, R. V. 1973. Radioactive Halos. *Annual Review of Nuclear Science*. 23: 347-362.
14. Adapted from DeYoung, D. 2005. *Thousands...Not Billions: Challenging an Icon of Evolution Questioning the Age of the Earth*. Green Forest, AR: Master Books, 91.
15. Snelling, Radiohalos in Granites, 152-174.
16. Dr. John Baumgardner's private e-mail communication with Dr. Vernon R. Cupps on May 5, 2018, concerning radiohalos and zircon crystals.
17. See ICR.org/rate for more information on the RATE project.

Dr. Cupps is Research Associate at the Institute for Creation Research and earned his Ph.D. in nuclear physics at Indiana University-Bloomington. He spent time at the Los Alamos National Laboratory before taking a position as Radiation Physicist at Fermi National Accelerator Laboratory, where he directed a radiochemical analysis laboratory from 1988 to 2011. He is a published researcher with 73 publications.



ICR Discovery Center Update



June 2017



July 2017



August 2017



September 2017



October 2017



November 2017



December 2017



January 2018



February 2018



March 2018



April 2018



May 2018

Help Us Complete the ICR Discovery Center's Exhibits

A lot has happened in the past 12 months. We grabbed an image each month from the stationary camera positioned above the construction site and documented our progress through the seasons as our dedicated crew built the discovery center's exterior.

Now we're raising funds for the interior exhibits. We're developing the most educational and inspirational exhibits possible. Together, let's point people to the truth of our Creator, the Lord Jesus Christ.

Visit ICR.org/DiscoveryCenter to find out how you can join us in this vital project.



A popular meme of evolutionary speculation is the belief that many DNA sequences in the genome have the capacity to freely mutate and thus can function as a mechanism for creating new selectable traits that help creatures evolve. This idea was initially applied to genes' protein-coding regions.

Proteins are chains of amino acids whose specific sequences are defined in genes' coding regions within chromosomes. Copies of genes are made using RNA and then processed to contain only the coding regions. These RNA messages are taken out of the cell's nucleus, which houses the chromosomes, and transported into the cytoplasm to make proteins using specialized machines called *ribosomes*. When an RNA is decoded, each three-base sequence, called a *codon*, specifies a single amino acid in the protein sequence.

Codons were initially thought to possess redundancy because there are 61 of them, compared to only 20 amino acids. The first two RNA bases in the sequence stay the same, but the third base is variable. For example, the codons GGA, GGC, GGU, and GGG all specify an amino acid called *glycine*, even though the third base is different. As a result, the third base was deemed degenerate and referred to as *codon wobble*. Evolutionists originally believed that this variability in the third base left room for evolution to somehow work its magic since they thought DNA at these "degenerate sites" could mutate without affecting the resulting protein.

While the idea of codon degeneracy has been promoted for years as a viable place in the genome where evolution can occur and actually be measured, research discoveries over the past decade have increasingly discredited this concept. Perhaps the most exciting discovery is that other codes are embedded within and overlay the codons.

Codons Are Not Degenerate After All

article highlights

- Evolutionists have long thought that DNA can mutate and create new traits.
- Because codons are variable, evolutionists speculated they have the capacity to develop new traits through random chance.
- Recent research indicates codons contain valuable and functionally specific genetic information in multiple layers.
- This profound genetic language can only come from a Master Designer.

In one study, it was found that a different set of code overlaying the codons instructs cellular protein machinery called *transcription factors*, which control the expression of genes, where to latch on to the DNA inside genes.¹ While one group of codons delineates the amino acid order in a protein, the exact same sequence of DNA letters can also instruct cellular machinery where to bind to the gene to make the RNA copies needed to make a protein. Researchers called these codes *duons*.

Shortly after the discovery of duons, another set of codon codes was identified that controls the rate of protein manufactur-

ing at the ribosomal machinery. Altering the rate of protein manufacturing plays an important role in the proper folding of a protein while it is being made.²

As if the presence of two overlaying codes in the same sequence was not enough, another discovery showed that the third base in codons also regulates the rate of RNA being copied from a gene, along with the levels of RNA copies that are made.³ This also has a downstream effect on the amount of protein that is produced.

Now an additional research report is showing that a fourth code exists in the third base of codons that is related to the overall efficiency of the cells' protein production. Since many proteins from many genes are made at once, the fundamental resources allocated to each type of protein (transfer RNAs) are critical. Like factories that make multiple products, all the assembly lines need a steady supply of parts, and the processes need to be perfectly orchestrated. This complex coordination and resource distribution are affected by the third base in codons.⁴

Expert human computer programmers can only write a line of code with a single directive. An all-powerful Creator is the only explanation for genetic code that has up to four different layers of instruction in the same sequence of information. ✉

References

1. Tomkins, J. P. Duons: Parallel Gene Code Defies Evolution. *Creation Science Update*. Posted on ICR.org January 6, 2014, accessed May 9, 2018.
2. Tomkins, J. P. Dual-Genes Codes Defy Evolution...Again. *Creation Science Update*. Posted on ICR.org September 12, 2014, accessed May 9, 2018.
3. Tomkins, J. P. Codon Degeneracy Discredited Again. *Creation Science Update*. Posted on ICR.org October 13, 2016, accessed May 9, 2018.
4. Frumkin, I. et al. 2018. Codon usage of highly expressed genes affects proteome-wide translation efficiency. *Proceedings of the National Academy of Sciences*. Published online before print May 7, 2018.

Dr. Tomkins is Director of Life Sciences and earned his Ph.D. in genetics from Clemson University.



Q: Did Medieval Artists See Real Dinosaurs?

A few years ago I visited Carlisle Cathedral, a very old church in northern England. I'd seen pictures of medieval carvings from this church that looked like dinosaurs.¹ How could this be, unless the artists somehow saw the dinosaurs they carved? Maybe they weren't dinosaurs after all. I thought a closer look might help me decide.

My wife, Michele, joined me. She persuaded the kind rector to remove the rug that covers the tomb of Bishop Richard Bell, located in the middle of the church floor (Figures 1 and 2). Brass decorations on the tomb include the dinosaur look-alike carvings. Even though we said nothing about our specific interest, the rector mentioned that despite what he had heard from others, there were no dinosaurs pictured at his church.

A nearby wall plaque identified 1478 as the year Richard Bell became Bishop of Carlisle. Bell died in 1496, when Martin Luther was 13 years old. Who knows what animals may have lived in Europe back then that have since gone extinct?



Figure 2. Upper portion of Bishop Bell's tomb. The banner over his head quotes Job 19:25 in Latin.

Image credit: Brian Thomas.



Figure 3. Bird carving on Bishop Bell's tomb.

Image credit: Brian Thomas.

article highlights

- A tomb in Carlisle Cathedral has a 500-year-old brass carving of what appear to be two dinosaurs.
- One dinosaur closely resembles the sauropod *Shunosaurus*.
- How did the medieval artist know how to carve these exact sauropod look-alikes?
- It seems these creatures lived in Europe only centuries ago.



Figure 1. The ancient choir hall in Carlisle Cathedral, UK. The blue rug in the center aisle covers the fascinating decorations on Bishop Bell's tomb.

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Within Bishop Bell's tomb decorations, we saw true-to-form carvings of normal animals like an eel, a dog, a fish, and a bird (Figure 3). Others were trickier to identify, but none of them looked childish or fanciful. I took a closer look at the two dinosaur look-alikes. The palm of my hand could cover the whole design. It shows two long-tailed creatures with legs that go straight down like dinosaurs' legs did, rather than angling to the side like those of modern crocodiles. Their long necks intertwine in a reptilian wrestling match. If I were trying to etch two sauropod dinosaurs in brass, I would carve something just like this (Figure 4).

The images look like high-hipped sauropods, as opposed to high-shouldered ones.² Centuries of foot traffic have worn down the head and neck regions, but the sauropod on the left has a tail tip with a knob that bears spikes. Fossil experts didn't discover sauropod tail clubs until about 1989, from a *Shunosaurus* fossil found in China.³ A report in 2009 revealed another rare sauropod named *Spinophorosaurus* with a spiked tail club, this time from the Republic of Niger in Africa.⁴ Both fossils had spikes in two sets of two. The Bishop Bell sauropod also shows four tail spikes. How could a 15th-century artist have known about such details

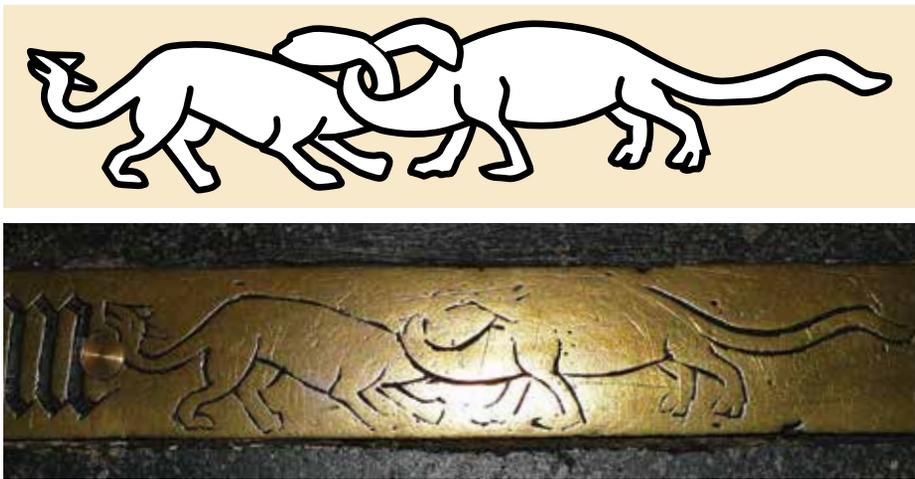


Figure 4. Bell's sauropod look-alikes.

Image credit: Dave and Joliet Lee.

as straight legs, long necks, and spiked tails? What best explains this fascinating carving?

Could it be a modern forgery? That's not realistic. Nobody has found evidence of forgery. The sauropods are integrated into the whole work of art, they reveal the wear and tear expected from centuries of foot traffic, and the grave marker has been known and described for centuries.⁵ Did the ancient artist carve imaginary creatures that just happen to look like sauropods? The list of matching body parts makes this equally unlikely. What animal other than a *Spinophorosaurus*-type had all these features?

- Long, flexible necks
- Legs aimed down from the body
- Knees aimed forward and elbows that point backward
- Long, flexible tails
- Arch-shaped backs with high hips
- Four tail spikes on a tail club

The book *Dire Dragons* contains many dinosaur depictions from around the world, including this one. Author Vance Nelson argues that if one straightened the spiked tail, one pair of spikes would point up and the second pair would point backward, just like actual fossils suggest (Figure 5).⁶

If Bishop Bell's artist saw live sauropods—or at least saw drawings or heard descriptions of them—then no wonder he or she carved images that look like sauropods. But that would mean dinosaurs lived in or near medieval England. If so, where did they come from, and where did they go?

Using the Bible as a history guide, we can start with the Job 40 behemoth, which Job was commanded to “look now at.” God told Job this creature was “the first of the ways of God” (v. 19). The behemoth was undisturbed though “the river may rage”

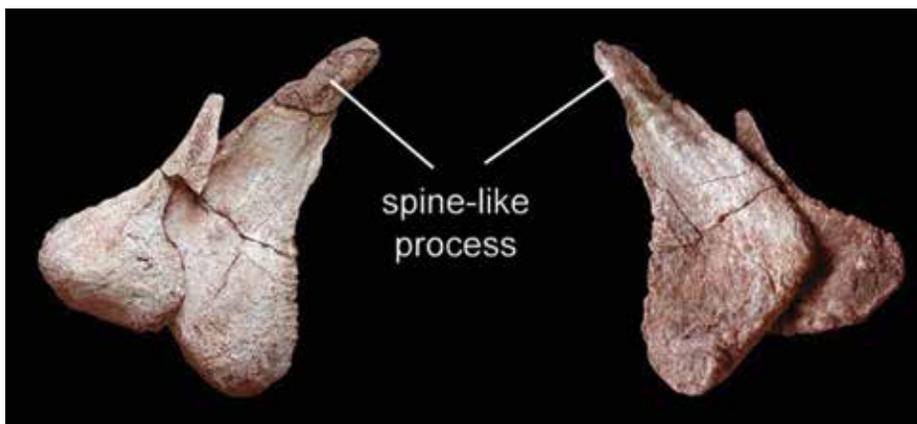


Figure 5. The two paired tail spikes of *Spinophorosaurus nigerensis*.

Image credit: Remes et al, 2009, PLOS ONE.⁴ Adapted for use in accordance with federal copyright (fair use doctrine) law. Usage by ICR does not imply endorsement of copyright holders.

(v. 23). In other words, it was huge. Its prominent hips and “tail like a cedar” (v. 17) fit a sauropod—the largest land animals that God “made along with you” (v. 15) on Day 6 of the creation week.

Job 40 describes behemoth's lush swamp, and verse 23 names the Jordan River. Scripture tells of many droughts that caused famines after that time, leading to arid conditions in today's Jordan and across the Middle East. So, dinosaurs lived in the area after the Flood but went away after drastic climate change erased their swamps. A similar scene could have happened in Europe.

The first post-Flood dinosaurs came from Noah's Ark, which landed in the Middle East. From there, descendants found new swamps. They could have walked on land that connected France to England during the Ice Age, when the sea level was lower. A giant ice dam soon broke and released an enormous lake that carved the English Channel and helped raise the sea level.⁷ Living dinosaurs are unknown today, so where did they go? Europe's inhabitants drained its many swamps long ago. Dinosaurs dwindled when their wet homes dried, and others might have been killed because people saw them as a threat.

After sifting the evidence, I decided to disagree with the rector at Carlisle Cathedral. I cannot deny the clear dinosaur decor on Bishop Bell's tomb. Not just any old dinosaur, but one like a *Shunosaurus*, alive and beheld by humans just like Job's behemoth. 🐉

References

1. Bell, P. 2003. Bishop Bell's brass behemoths! *Creation*. 25 (4): 40-44.
2. Brachiosauids had tall shoulders, whereas diplodocids and others had tall hips.
3. Dong, Z., G. Peng, and D. Huang. 1989. The Discovery of the Bony Tail Club of Sauropods. *Vertebrata Palasiatica*. 27 (3): 219-224.
4. Remes, K. et al. 2009. A New Basal Sauropod Dinosaur from the Middle Jurassic of Niger and the Early Evolution of Sauropoda. *PLOS ONE* 4 (9): e6924.
5. For example, Bishop Bell's brass was described long ago in Eley, C. K. 1900. *The Cathedral Church of Carlisle*. Edinburgh, UK: Riverside Press, 53.
6. Nelson, V. 2011. *Dire Dragons*, 3rd ed. Red Deer, AB: Untold Secrets of Planet Earth Publishing Co., 74.
7. Gupta, S. et al. 2007. Catastrophic flooding origin of shelf valley systems in the English Channel. *Nature*. 448 (7151): 342-345.

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Adaptive Solutions Are Targeted, Not Trial-and-Error

R A N D Y J . G U L I U Z Z A , P . E . , M . D .



How do you know when evolutionary theory is following the facts or just inventing them? Consider this statement by evolutionary authority Jerry Coyne:

True, the raw materials for evolution—the variations between individuals—are indeed produced by chance mutations. These mutations occur willy-nilly, regardless of whether they are good or bad for the individual.¹

Is Coyne summarizing the nature of genetic change based on real observations, or is he reciting a tenet of faith from something akin to “The Evolutionist’s Creed”? Better yet, if scientific evidence is the dog and evolutionary theory is its tail, is the dog wagging the tail or is the tail wagging the dog?

As we saw in last month’s article, evolutionary theory requires accidental, non-purposeful, random variation as the source of adaptive traits.² This insistence on “chance mutations” continues despite evidence that organisms’ self-adjustments are rooted in highly regulated variation. Why? Because evolutionism is fundamentally an anti-design worldview that opposes the possibility that adaptive biological systems produce purposeful, targeted solutions in response to environmental challenges.

This series of Engineered Adaptability articles assesses the evidence and offers

article highlights

- Evolutionary theory’s anti-design bias sees adaptations as the result of “copious” trial-and-error tinkering rather than purposeful engineering.
- When the consequences of failure are catastrophic, lethal, or time-limited, human engineers design solutions that are targeted, not trial-and-error.
- Researchers increasingly discover that organisms express highly targeted self-adjustments that are “repeatable” and “predictable.”
- The continuous environmental tracking model expects purposefully targeted adaptive responses produced by innate, logic-based mechanisms.

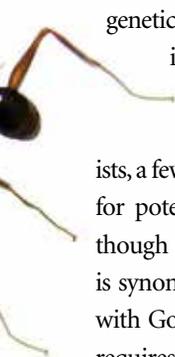
an organism-focused, engineering-based framework of adaptability called *continuous environmental tracking* (CET). If we observe what organisms actually do and achieve, it appears they continuously track environmental changes and self-adjust with suitable, often epigenetically heritable traits or behaviors that result in adaptation to the new environment. When we use the CET framework to interpret observations on the organism-environment interface, the data indicate that adaptive capacity resides solely

within organisms. And adaptation often happens through highly regulated systems with elements that correspond to human-engineered tracking systems.

Coyne may not realize why he insists on “chance” variation, or believes that it’s “willy-nilly” concerning purpose, or how these fit into theory...but Darwin certainly did. Last month’s article noted Stephen Jay Gould’s acknowledgment that Darwin saw the “specter” of directed variation as disastrous to his theory. Gould spelled out three criteria Darwinism requires for genetic variability. Like the tail wagging the dog, evolutionary theory—not evidence—demands that variation be copious, gradual, and undirected.³ All three characteristics convey the notion that trait variations are random and not purposefully engineered solutions targeting environmental challenges. Last month we examined undirected. Now let’s consider copious.

Copious Variation Allows Nature Many Attempts at Trial-and-Error Solutions

When evolutionary theorist Andreas Wagner says that “over thousands and millions of generations, copy error after tolerable copy error can thus accumulate and slowly change a protein’s amino acid sequence,”⁴ he’s envisioning—not observing—the wishful evolutionary outcome of *copious* random



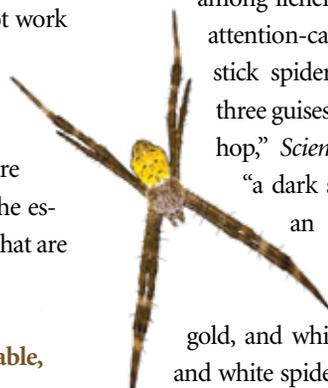
genetic variation. Wagner later characterizes this as a “trial and error” process fueled by an overflowing flood of random errors. To evolutionists, a few lucky solutions are source material for potentially innovative biological traits, though Wagner acknowledges that “error” is synonymous with death. His view aligns with Gould’s understanding that evolution requires copious “hecatombs of death as pre-conditions for limited increments of change” in “a theory of ‘trial and error externalism,’”⁵ which reinforces science philosopher Peter Godfrey-Smith’s understanding that evolution “can be described loosely as ‘trial and error.’”⁶

The anti-design thrust of evolutionary theory should be obvious. Solutions depicted as trial-and-error or hit-and-miss would mean that evolution “does not work as an engineer works. It works like a tinkerer.”⁷ In total contrast, engineers can’t accept trial and error when the consequences of failure are catastrophic, lethal, or if time is of the essence. Instead, they design solutions that are targeted, predictable, and repeatable.

Biological Reality: Targeted, Repeatable, Predictable Solutions

Insects

Beetles and army ants don’t usually look alike. But if beetles could self-adjust to look, behave, and smell like army ants so they blend in with—and are not eaten by—these aggressive ants, then that would be an amazingly targeted solution to a lethal problem. Two scientists claim that at least 12 times over the last 60 million years, rove beetles have independently mimicked a minimum of eight very different types of army ants.⁸ Hinting strongly at internal mechanisms that regulate the beetles’ remarkable changes in shape, they propose that the beetles are “poised for myrmecophily [becoming ant-like]” and that “this near-clade-wide preadaptive groundplan may underlie the repeated” ant mimicry. They conclude:



In reconstructing their [rove beetle] evolutionary history, we uncovered evidence of conspicuous, repeated evolution over deep time that runs counter to the notion of evolutionary contingency and represents a new paradigm for understanding the origins of interspecies relationships.⁸

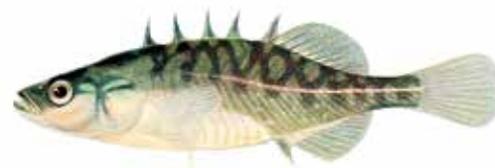
An ancillary report on their work plainly states that it “provides evidence that evolution has the capacity to repeat itself in an astonishingly predictable way.”⁹

One study showed that some stick spiders demonstrate highly targeted self-adjustments when migrating between different Hawaiian Islands.¹⁰ Offspring rapidly speciate after migration, with dark ones living among rocks or tree bark, gold ones amid leaves, and matte-white ones among lichens. In a story with the attention-catching title “Hawaiian stick spiders re-evolve the same three guises every time they island hop,” *ScienceDaily* reported that “a dark spider that hops from an old island to a new one can diversify into new species of dark, gold, and white spiders before gold and white spiders from the old island have time to reach the new one.”¹¹ This means that new species on the same island that look quite different are more closely related than they are to lookalikes on other islands. The mismatch between predictable self-adjustments and evolutionary theory was noted:

We don’t usually expect evolution to be predictable. But Hawaiian stick spiders of the *Ariamnes* genus have repeatedly evolved the same distinctive forms, known as ecomorphs, on different islands.¹¹

Fish

When identical adjustments occur in the vision of different types of fish so they can see better in murky water, one could interpret that as a targeted solution to a specific challenge. In some sticklebacks,



David Marques found that the visual molecule opsin had been “tuned” in a specific way so these fish could fill a “blackwater” niche. Later, the exact changes were found in two other species of spiny-fin fish in dark-water conditions. Marques concludes, “Our study thus supports the emerging view [in evolutionary biology] that mechanisms underlying adaptive evolution are often highly repeatable and likely predictable.”¹²

Reptiles

In Brazil, flooding for a reservoir rapidly created five islands that isolated geckos from mainland counterparts and each other. Large geckos went extinct shortly afterward. Within 15 years, each smaller gecko population, males and females alike, ate larger prey and had independently adjusted with equivalent “predictable” and “precise” responses of bigger mouths and heads relative to body length compared to their mainland relatives. The findings “illustrate that populations can respond both rapidly, and in parallel, to ecological change,” the researchers said, noting their findings mirrored those discovered in four different organisms exhibiting “predictable and repeatable morphological change.”¹³

Hurricanes in 2004 decimated *Anolis* lizard populations on seven small islands vegetated with plants that have scrawny stems and twigs. Lizard specialist Jonathan Losos from Harvard repopulated the islands with lizards from a nearby large, forested is-





land. Losos said, “Our prediction was that they would evolve shorter legs. And they did. Over the course of four years, average limb length steadily declined on all seven islands...exactly as predicted.” In fact, prior to an intervening hurricane, Losos claims that “all seven islands were evolving in lock-step.”¹⁴

Another study found that unrelated pythons and boas express five distinct yet nearly identical morphologies “when they occupy equivalent ecological niches.” These traits were so specific and repetitive for certain environments that they were described as “predictable.”¹⁵

For some vital traits, a higher level of genetic regulation is needed. New findings show that some DNA nucleotides must change in a specific order. Research on independent lineages of common garter snakes found identical changes to the genetics specifying a skeletal muscle ion channel that conferred resistance to a potent neurotoxin made in the skin of a food source, the Pacific newt.¹⁶ Given the life-or-death necessity of this adaptation versus evolutionary theory’s trial-and-error solutions, the researchers wondered, “If many conceivable solutions exist to an evolutionary problem, when and why does adaptation proceed through a repeated or predictable route?” Their background investigation highlighted that “repeated outcomes of molecular evolution are attributed to a number of *non-exclusive biases* in the substitution process of amino acids.” Their similar findings prompted their conclusion that toxin “resistance cannot be achieved unless mutations occur in a particular order,” adding that “a growing list of empirical studies point to the importance of sequential order in the mutational route to adaptation.”¹⁶

An adjunct article titled “Know your poison: Predictable molecular changes con-

fer toxin resistance in snakes” points out the discrepancy of these results with evolutionary theory, “since molecular mutations are assumed to be largely random” and should not “occur more frequently than would be expected by chance,” yet we find “identical amino acid substitutions at the same locus in unrelated taxa.”¹⁷

Bacteria

The technical journal *Nature* posted an intriguing report on *E. coli* research titled “Predictable evolution trumps randomness of mutations: Separate bacteria populations may respond to environmental changes in identical ways.” Like with the garter snakes, bacteriologists observed new traits appearing in a particular order among independent populations. After reporting on the genetic basis of these changes, however, the report simply absorbed the incongruent findings into evolutionary theory:

Although mutations, the driver of evolution, occur at random, a study of the bacterium *Escherichia coli* reveals that nature often finds the same solution to the same problem again and again.... The DNA showed that in some cases identical mutations appeared independently in all three test tubes.¹⁸

CET Expects Targeted, Repeatable, Predictable Solutions

Researchers are taken aback when they find an adaptable solution that can “repeat itself in an astonishingly predictable way.” Such a situation “runs counter to the notion of evolutionary contingency” because it involves “mechanisms underlying adaptive evolution [that] are often highly repeatable” through programming that may be “poised for myrmecophily [becoming ant-like]” by a “preadaptive groundplan.” These experimental results clearly contradict the notion that adaptive genetic and epigenetic variability are generated or fractioned out by processes of trial-and-error tinkering.

However, finding targeted adaptive outcomes that are repeatable and predict-

able strongly suggests purposeful responses by non-random, logic-based mechanisms consistent with the CET framework. Recall the experience of “junk DNA.” Researchers found true regulatory functions in isolated segments of DNA that had been labeled “junk.” More exceptions prompted them to explore further...which uncovered a torrent of new functions.¹⁹ Consistent with CET, we expect that as researchers start looking for them, more targeted, repeatable, and predictable adaptive responses will be discovered. ☞

References

1. Coyne, J. 2009. *Why Evolution Is True*. New York: Viking, 119.
2. Guliuzza, R. J. 2018. Engineered Adaptability: Adaptive Changes Are Purposeful, Not Random. *Acts & Facts*. 47 (6): 17-19.
3. Gould, S. J. 2002. *The Structure of Evolutionary Theory*. Cambridge, MA: Harvard University Press, 145.
4. Wagner, A. 2014. *Arrival of the Fittest: Solving Evolution's Greatest Puzzle*. New York: Current, 120, 196.
5. Gould, S. J. 1994. The Power of This View of Life. *Natural History*. 103 (6): 6-8.
6. Godfrey-Smith, P. 2010. It Got Eaten. *London Review of Books*. 32 (13): 29-30.
7. Jacob, F. 1977. Evolution and tinkering. *Science*. 196 (4295): 1161-1166.
8. Maruyama, M. and J. Parker. 2017. Deep-Time Convergence in Rove Beetle Symbionts of Army Ants. *Current Biology*. 27 (6): 920-926.
9. Convergent con artists: How rove beetles keep evolving into army ant parasites. *EurekaAlert*. Posted on eurekaalert.org March 9, 2017, accessed April 27, 2018.
10. Gillespie, R. G. et al. 2018. Repeated Diversification of Ecological Niches in Hawaiian Stick Spiders. *Current Biology*. 28 (6): 941-947.
11. Hawaiian stick spiders re-evolve the same three guises every time they island hop. *ScienceDaily*. Posted on sciencedaily.com March 8, 2018, accessed March 9, 2018.
12. Marques, D. A. et al. 2017. Convergent evolution of SWS2 opsin facilitates adaptive radiation of threespine stickleback into different light environments. *PLOS Biology*. 15 (4): e2001627.
13. de Amorim, M. E. et al. 2017. Lizards on newly created islands independently and rapidly adapt in morphology and diet. *Proceedings of the National Academy of Science*. 114 (33): 8812-8816.
14. Losos, J. B. 2017. *Improbable Destinies: Fate, Chance, and the Future of Evolution*. New York: Riverhead Books, 178.
15. Esquerre, D. and J. S. Keogh. 2016. Parallel selective pressures drive convergent diversification of phenotypes in pythons and boas. *Ecology Letters*. 19 (7): 800-809.
16. Hague, M. T. J. et al. 2017. Convergent adaptation to dangerous prey proceeds through the same first-step mutation in the garter snake *Thamnophis sirtalis*. *Evolution*. 71 (6): 1504-1518. Emphasis added.
17. Davies, K. T. J. 2017. Digest: Know your poison: Predictable molecular changes confer toxin resistance in snakes. *Evolution*. 71 (6): 1728-1729.
18. Laursen, L. Predictable evolution trumps randomness of mutations: Separate bacteria populations may respond to environmental changes in identical ways. *Nature News*. Posted on nature.com February 19, 2013.
19. Guliuzza, R. J. 2017. Major Evolutionary Blunders: Evolutionists Strike Out with Imaginary Junk DNA, Part 2. *Acts & Facts*. 46 (5): 16-19.

Dr. Guliuzza is ICR's National Representative. He earned his M.D. from the University of Minnesota, his Master of Public Health from Harvard University, and served in the U.S. Air Force as 28th Bomb Wing Flight Surgeon and Chief of Aerospace Medicine. Dr. Guliuzza is also a registered Professional Engineer.



Withstanding Winter Weather

On hot July days you might miss winter's chill.¹ In higher latitudes, however, it's the coldness that needs mitigation. For example, Arctic insects and arachnids are cold-blooded, so freezing to death is a real possibility!

How can insects and arachnids withstand frigid forces of frost and freezing?² The answer highlights a strong apologetics argument for creation. Evolutionists are routinely guilty of the oversimplification fallacy, as if creature survival traits implement "one size fits all" simplicity.³ The opposite is true—God loves variety and intricate details, so don't be surprised when He employs diverse problem-solving strategies to overcome the same problem. With careful bioengineering (including environmental tracking programming), God has providentially prepared multi-legged creepy critters with five very different solutions to avoid being fatally frozen.

Options 1 and 2: Live Where It Never Freezes or Migrate There

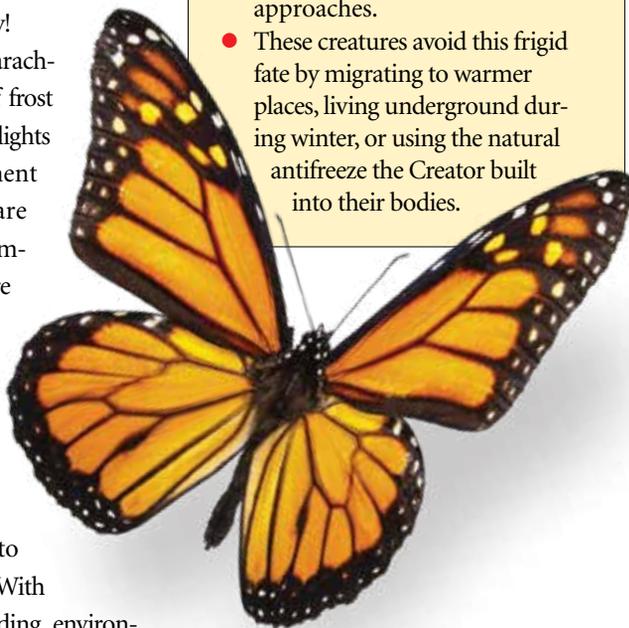
The easiest survive-the-cold strategy is to live, as jungle bugs do, where it never gets cold enough to freeze. Another avoidance strategy is seasonal migration, illustrated by monarch butterflies, which migrate south for overwintering, then return north with the warmer spring weather.⁴

Option 3: Hibernation-like Freeze Avoidance

Some nonmigratory social insects, including ants and termites, survive winter by hunkering down in *diapause*, a state similar to hibernation, in underground colonies located below the frostline. There they stay warm and feed on stored food as they wait for spring.⁵

article highlights

- Insects and arachnids in northern latitudes are susceptible to freezing to death when winter approaches.
- These creatures avoid this frigid fate by migrating to warmer places, living underground during winter, or using the natural antifreeze the Creator built into their bodies.



Options 4 and 5: Supercooling "Antifreeze" and/or Freeze Tolerance

An amazing survival option for many insects and spiders is to safeguard their hemolymph—essentially bug blood—with built-in "antifreeze" biochemicals. God designed some insects with physiologies that actually lower the hemolymph's freezing point, using thermal hysteresis proteins ("antifreeze" proteins) in conjunction with sugar polymers such as xylomannan and/or glycerol.^{6,7} Most insects that survive frigid temperatures use this "antifreeze" option, but some insects are actually able to tolerate some amount of freezing.⁶⁻⁸

At least for insects, one way is tolerance of ice crystal formation in their bodies (freeze tolerance), and the other is avoidance of ice crystal formation (freeze avoidance). Ice crystal formation is avoided by super-cooling, which depresses the freezing point...[facilitated by] accumulation of poly-ol compounds in the hemolymph (thus increasing the osmotic pressure), dehy-

dratation (also increasing osmotic pressure), synthesis of thermal-hysteresis protein, or evacuation or masking of ice-nucleation factors in the gut.⁷

Freeze-tolerant insects, like some arctic beetles, appear to employ physiologies that manipulate intracellular ice-nucleating agents and apply protein-stabilizing cryoprotectant substances to limit hemolymph ice crystal formation to extracellular compartments, and this prevents intracellular crystallization.^{6,8}

How would beetles evolve these magnificent adaptabilities, phenologically indexed to Earth's annual temperature and photoperiodicity rhythms? There is no way that random mutations accidentally "emerging" along insect or spider genomes could ever program bug physiologies to so successfully fill super-cold habitats. As a matter of cold logic and biochemistry, these super-cool critters can't be lucky products of evolutionary magic. They instead demonstrate God's creatorship! 🦋

References

1. Contentment, as seasons and weather change, can be a challenge (Philippians 4:11). After the Flood, God promised that Earth would experience seasonal weather cycles, including recurring cold weather (Genesis 8:22). This promise provides predictability for humans and animals.
2. Some say winter frost or icy freezes kill off the bugs. They always return in spring, so obviously they are surviving winter somehow.
3. Tomkins, J. P. 2018. Human Traits Not So Simple After All. *Acts & Facts*, 47 (2): 15.
4. Moody Bible Institute. 2010. *Animal Kingdom—Great Are Thy Works*. DVD. The Wonders of Creation, vol. 5. Questar, Inc.
5. Proverbs 30:25. See also Cabrera, B. J. and S. T. Kamble. 2001. Effects of Decreasing Thermophotoperiod on the Eastern Subterranean Termite (Isoptera: Rhinotermitidae). *Environmental Entomology*, 30 (2): 166-171. ("Our results... suggest that successfully overwintering *R. flavipes* [termite] colonies retreat to soil depths where freezing temperatures are not encountered.")
6. Somme, L. 1995. *Invertebrates in Hot and Cold Arid Environments*. New York: Springer, 194-213. Regarding xylomannan's role in Alaska's flat bark beetle, see Rozell, N. Alaska Beetles Survive 'Unearthly' Temperatures. Geophysical Institute, University of Alaska Fairbanks. Posted on gi.alaska.edu March 1, 2012.
7. Murphy, J., T. Rossolimo, and S. Ada. 2008. Cold-hardiness in the Wolf Spider *Pardosa groenlandica* (Thorell) with Respect to Thermal Limits and Dehydration. *Journal of Arachnology*, 36 (1): 213-215.
8. Zachariassen, K. E. and H. T. Hammel. 1976. Nucleating agents in the haemolymph of insects tolerant to freezing. *Nature*, 262 (5566): 285-287.

Dr. Johnson is Associate Professor of Apologetics and Chief Academic Officer at the Institute for Creation Research.



Counting the Cost

The ICR Discovery Center for Science and Earth History, currently under construction, will have a total cost of around \$30 million. With such a lofty price tag, some of ICR's supporters are concerned there may be other things we should be spending our resources on. As one recently put it, "Has ICR truly counted the cost for such a grand new venture?"

The short answer is yes—absolutely.

There will never be a shortage of good Christian causes and projects that need support. But financial considerations, while important, are only one aspect of "counting the cost." We should also weigh the potential for outreach, cultural impact, sustainability, and opportunities for greater and more effective ministry. The ICR Discovery Center will possess distinctive features that make it an especially worthy project for the cause of Christ.

ICR is always mindful that we represent Christ here on Earth (2 Corinthians 5:20). Not only is Jesus our Savior and Redeemer, He is also the Creator who spoke the heavens into existence (Psalm 33:6) and walked with Adam and Eve in the cool of the day (Genesis 3:8). And this same Jesus will one day return in great power and glory as King of kings and Lord of lords (Revelation 19:11-16).

With this perspective, ICR (and all Christians) should represent Jesus and His gospel as best as we can. God has brought us world-class designers and craftsmen capable of creating a magnificent facility, and the displays and exhibits within the center will reflect the highest level of excellence available today. Such expertise can be expensive, but in view of the people we can reach with the truth, the costs are inconse-



"FOR WHICH OF YOU, INTENDING TO BUILD A TOWER, DOES NOT SIT DOWN FIRST AND COUNT THE COST?"

(LUKE 14:28)

article highlights

- The ICR Discovery Center for Science and Earth History will cost a total of around \$30 million when completed.
- Is this tremendous effort worth it? Absolutely!
- ICR will reach over 100,000 visitors each year—many of them children—with scientific evidence that supports Genesis.

quential in terms of eternity.

How many will we reach? *Conservative* estimates by industry experts expect 100,000 visitors each year, and a sizable majority of these will be school-age children. Moreover, where churches generally reach the same audience week after week, people not normally inclined to attend church will welcome a visit to the ICR Discovery Center. This, coupled with the natural turnover of students as they age out of their school years, will enable the ICR Discovery Center to reach new generations over time. The potential to positively impact our culture is enormous, and we are excited by the opportunities for a more effective witness.

In the end, ICR has two primary objectives that will be greatly enhanced by the

ICR Discovery Center. The first is *discipleship*: We encourage the faith and witness of fellow believers with the scientific evidence that supports God's Word. The church today does a poor job in this regard, and many Christians remain ignorant of the powerful evidence that confirms the clear biblical account of recent and special creation.

The second is *evangelism*: We shatter the myth that science has proven the Bible wrong, and we point seekers to Jesus, our Creator and Savior. Judging by the countless testimonies we've received, God uses ICR's work to draw many people to Christ—a tremendous blessing we pray will continue to grow once the discovery center opens next year.

Yes, ICR has counted the cost, and it isn't only about money. As A.W. Tozer once wrote, "As base a thing as money often is, it yet can be transmuted into everlasting treasure... Whatever is given to Christ is immediately touched with immortality."¹ Please prayerfully consider joining with us. Your earthly investment with ICR today will impact lives for eternity. ✉

Reference

1. Tozer, A. W. 1987. *Born After Midnight*. Chicago, IL: Moody Publishers, 128.

Mr. Morris is Director of Donor Relations at the Institute for Creation Research.



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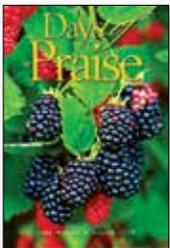
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This article is well-written and presented with complete clarity compared to the article written recently in *National Geographic* about the Bajaus!
— P. C.



Cannot say how much I love the daily emails and how much my wife and I have learned and how they have been such a strength in our sanctification! What a blessing. Thank you for doing what you're doing and spreading the true gospel!
— J. R. P.



I love ICR and read all *Acts & Facts*, including Henry Morris IV articles. One article suggested using ICR for retirement planning. So, last summer I began praying what to do with my pension from the hospital. I called ICR, and Henry Morris walked me through all the steps. The Lord gave me great peace about this, so I proceeded. Henry was so helpful. **But God answers prayers above what we ask, and we found in April that [through an ICR trust] the partial tax deduction saved us \$9,000 in income tax!** Thank you.
— V. W.

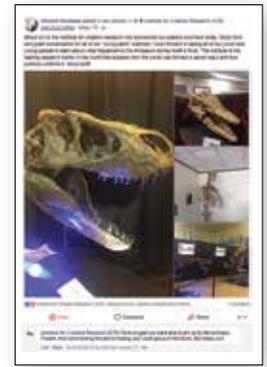
Editor's note: ICR has several valuable retirement tools. Go to **ICR.org/give**, contact our Stewardship Department at **stewardship@ICR.org**, or call **800.337.0375**.



Shout-out to the Institute for Creation Research, who sponsored our pastors luncheon today. Good food and great conversation for all of our "young earth" brethren. I look forward to taking all of our youth and young

people to learn about what happened to the dinosaurs during Noah's Flood. **The institute is the leading research center in the world that explains how the world was formed in seven days and how science confirms it.** Good stuff!

— V. G.



◀ Editor's note: Several bloggers review our resources. One of them sent this in.



When we read the *Creation Q&A* book, we immediately saw its value to reach the junior high/high school kids we work with, so we bought 100 to use as giveaways. We especially liked the summary of each topic with a reference to

additional information. Our mission is to reach younger people with the creation message, and this book fits this need.
— J. F.

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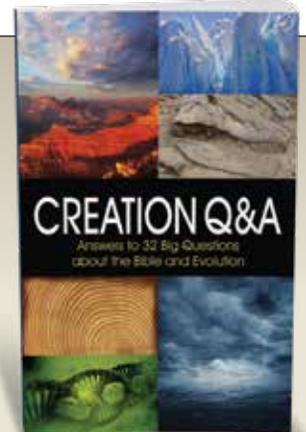
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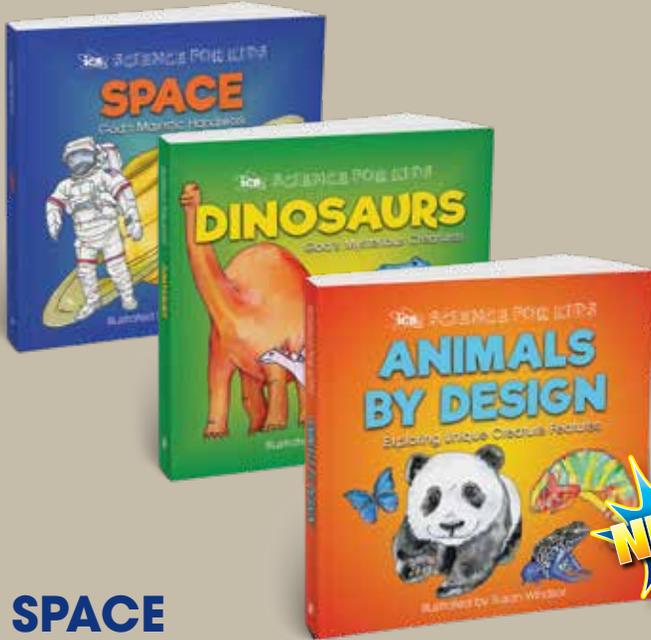


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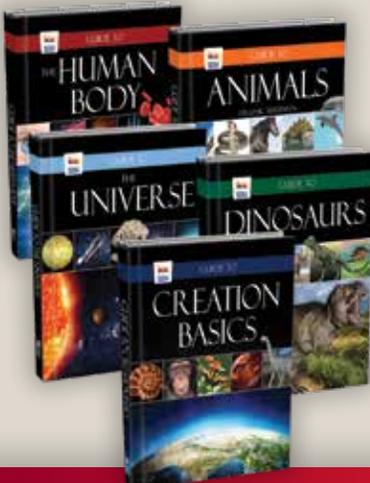
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