ACTS & FACTS

INSTITUTE FOR CREATION RESEARCH

ICR.org

JANUARY | FEBRUARY 2025

VOL. 54 NO. 1

COMMENTARIES BY TOM MEYER

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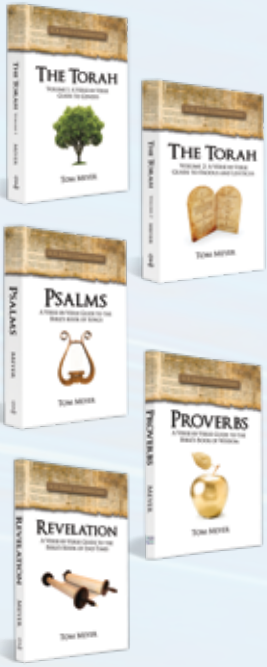

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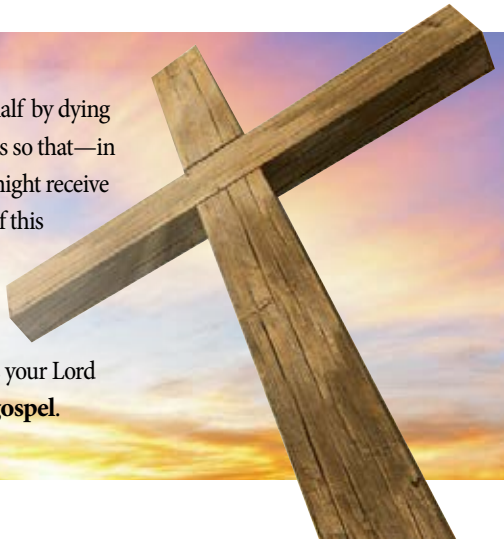

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DESIGNER
Dennis Davidson

[Jesus Christ] is the image of the invisible God, the firstborn over all creation. For by Him all things were created that are in heaven and that are on earth, visible and invisible, whether thrones or dominions or principalities or powers. All things were created through Him and for Him. And He is before all things, and in Him all things consist. And He is the head of the body, the church, who is the beginning, the firstborn from the dead, that in all things He may have the preeminence. For it pleased the Father that in Him all the fullness should dwell, and by Him to reconcile all things to Himself, by Him, whether things on earth or things in heaven, having made peace through the blood of His cross.
(Colossians 1:15–20)

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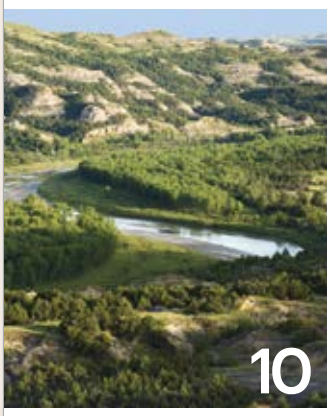
All Scripture quotations are from the New King James Version unless otherwise indicated.

Front cover: Rootless fossil tree stump, Theodore Roosevelt National Park
Image credit: Joel Kautt



A Great Year of Development!

2024 YEAR IN REVIEW

RANDY J. GULIUZZA, P.E., M.D.

The Institute for Creation Research had another outstanding year advancing creation science in 2024! We'll use this opening issue of *Acts & Facts* to recap ICR's major activities and blessings from the prior year, just as Dr. Henry M. Morris used to do. Back then I was always excited to see the Lord Jesus clearly empowering ICR's progress for creation science. His presence still abides and all credit still belongs to Him. Together we thank Him for the many good things He has done.

When thinking over 2024 it's hard not to just pull together a long list of statistics for each department. They do tell a good story. So, I'll mention some, but these incredible numbers don't give nearly the full picture.

The Institute for Creation Research staff standing in the ICR Discovery Center lobby
Image credit: Clint Loveness

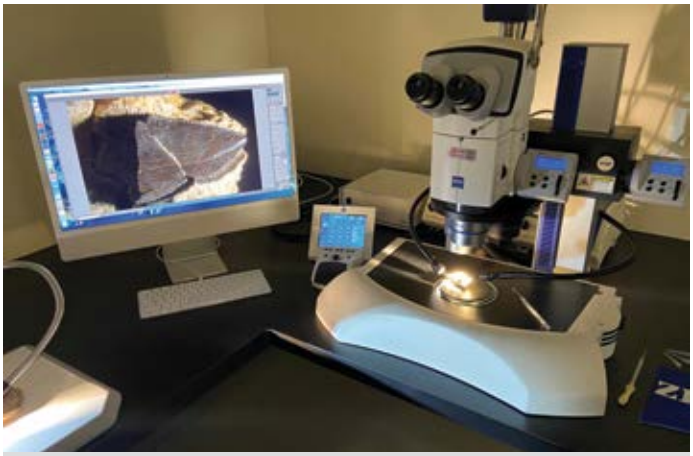
To start, in addition to thankfully acknowledging the goodness of the Lord Jesus, I'd love to also thank the whole staff for each one's contributions. They are the heart of ICR. Almost every department added new people who possess outstanding skills. They came at just the right time, and all are filling critical positions.

You may not know that our full-time staff members also fill monthly roles in the ICR Discovery Center as docents and speakers. It's a delight to see the folks in different departments working together in harmony and carrying one another's burdens. Their expectation of achievement, confidence, and overall morale remain very high. From my perspective, it's a joy to see them value being of one accord and placing ICR's mission above their self-interests.

The ICR Discovery Center in Dallas, Texas
Image credit: Susan Windsor

We're also blessed with many dedicated volunteers who deeply love ICR. Nearly all work at the ICR Discovery Center and are scheduled by the loving and imaginative Esther Marlan. Their behind-the-scenes work goes without much fanfare, but their contributions really add up. For instance, Jim Smith and Terry McClenny went over the 1,500-hour volunteer milestone, and Kerry Brenner is only a hair under. Incredible!

For 2024 we say to all of you, "Thank you!" Without your vital contribution we could not keep the Discovery Center running. As I say every year, the Lord has faithfully provided for ICR's staffing needs according to His riches in glory (Philippians 4:19).



ICR's Zeiss SteREO Discovery.V20 microscope in the William B. Dean, MD Imaging Center of the Institute for Creation Research
Image credit: Clint Loveness

Research Mission

ICR's distinguishing characteristic is research. Ours is definitely big picture, big impact, and advancing well across the board in creation science. The current cavefish research is the hardest and most extensive in-house research effort that ICR has ever undertaken.

This year we acquired four new strains with an identified genetic pedigree used by the major research labs. These have been coded, photographed, and placed into distinct water treatments. With each fish spawning we are able to isolate DNA, get photographs of microscopic developments (we've included some of these micrographs in *Acts & Facts*), and gather other data about how these fish go from sighted to blind and express other traits suitable for caves. Please continue to pray for specific insights for our researchers on this project.[1]

Left to right: ICR Research Scientist Dr. Jake Hebert, ICR Director of Research Dr. Tim Clarey, and ICR President Dr. Randy J. Guliuzza

Five new *Acts & Facts* articles have set us well on our way to profoundly changing how people understand biology through a new theory of biological design (TOBD).[2] Dr. Tim Clarey's worldwide borehole analysis has now compiled data on over 3,200 boreholes that detail the progressive and multi-continental nature of the Flood. Dr. Brian Thomas has added to his research into so-called "ancient" dinosaur tissues that are still distinctive and pliable. And Dr. Jeffrey Tomkins' fascinating research on directed and nonrandom genetic changes associated with adaptative changes is nearing completion.

Additionally, Dr. Jake Hebert has researched fossil evidence that suggests animals in the pre-Flood world experienced much greater lifespans, just like the humans recorded in the Bible, and he continues to extend Dr. Larry Vardiman's research on developing a biblical Ice Age model.

ICR Research Scientist Dr. Brian Thomas (left) and Glendive Dinosaur and Fossil Museum Field Paleontologist Tommy Lohman look on as ICR Video Producer Clint Loveness records the excavation of an enormous Triceratops *at a private ranch in northeast Montana.*
Image credit: Dave Napier

Our fourth scientific expedition was the best one yet in terms of samples collected. We'll explain more about the related research project in the coming months when we start to see results. We also excavated several dinosaur bones for analysis and recorded on-site interviews for future films.

This amazing research team is carrying on and extending ICR's incredible legacy both in the lab and outside of it. They spoke at all of our events, at four secular universities, and on many Christian and conventional programs. They write most of the articles for *Acts & Facts*, and you may be surprised to know that we also published eight peer-reviewed articles for *Journal of Creation*, *Creation Research Society Quarterly*, and theological journals.

This scientific work becomes the basis for all that we teach. The other departments then use their varied educational avenues to showcase ICR's research to impact the minds of several *millions* of people throughout the year.

ICR Creative Producer Trey Bowling interviews Dr. Randy Guliuzza in the ICR studio

Podcasts, Educational Miniseries, and Creation Class

Since its inception, ICR has been in a sort of David-versus-Goliath role. Given our rather small size, the impact ICR has in reaching millions of people is astounding. The Lord continues to give many victories, not just for numbers' sake but with changed thinking about creation.

Here are a few impressive milestones of the past year. Our YouTube channel had over eight million views in 2024, with our new creation science video "shorts" amassing 5.1 million views. This is approximately 50,000 hours of watch time. *The Creation Podcast* episodes accrued 509,600 views, equaling another 50,000 hours of viewing, and our new *Creation on Location* and other videos had 1.3 million views with a watch time of about 27,000 hours.

Left to right: Creative Producer Trey Bowling, Advertising Specialist Justin Moore, Director of Digital Media Michael Hansen, Media Production Manager James Turner, Video Editor Vicki Coolidge, Motion Graphics Designer Jim Zarbaugh, and Video Producer Clint Loveness hold ICR's first YouTube Award

Our YouTube subscriptions increased by over 339,000 last year. On Pray.com we currently have 308,000 followers, and our Facebook has around 162,000 followers. The ICR.org web page attracted over 1.7 million visitors, and our flagship program, *Science, Scripture & Salvation*, still airs on about 180 radio stations.

The same digital media team used entirely in-house resources to produce the five-episode *Carved in Stone* miniseries, which features Dr. Tim Clarey, and *More Than Survival: The Overdesign of Humankind* and *Elegant Earth: Christ's Ingenious Engineering of Creation*, both of which feature Dr. Stuart Burgess. We finished our second Creation Class: *Scientific Evidences for Creation* featuring Dr. Frank Sherwin, and then branched into a new area with *Biblical Archaeology*, which features Tom Meyer.

ICR Children's Education Specialist Emily Steele interviews Apollo astronaut General Charles Duke and his wife, Dorothy, at ICR's Great American Eclipse event in Forney, Texas, in April 2024
Image credit: Clint Loveness

Science-Educating Events

The Great American Solar Eclipse event in April at First Baptist Church in Forney, Texas, was attended by over 800 people, with NASA astronauts General Charlie Duke and Colonel Jeff Williams along with Dr. Jake Hebert. Throughout the year we conducted well over 100 different events, including 23 major church events in seven different states. We also spoke and conducted interviews at two secular universities.

Acts & Facts, *Days of Praise*, Books, and More

In 2024 ICR's Communications department not only produced the *Acts & Facts* magazine and *Days of Praise* devotional booklet, but they also published 203 articles for ICR's online *Creation Science Update* and wrote and illustrated four tracts that are freely distributed in the ICR Discovery Center. ICR Press published 18 new books, updated 13 books for reprint, and developed our first-ever creation-oriented, biblically consistent, futuristic graphic novel (to me it's an educational comic book), which we believe will be edifying to younger people. Watch for it in 2025!

ICR's new books in 2024. Visit ICR.org/store for more information about them.

Speaking of books, this year Communications expects to publish about 30 books, including a new Earth science textbook for a Liberty University class, with major contributions by Prof. Tom Breuner and ICR Drs. Clarey and Hebert. We're also scheduled to publish a series of lay-level science books. Dr. Clarey's book will explain why birds aren't dinosaurs, Dr. Tomkins' will discuss the genetic changes associated with adaptation, Dr. Thomas' will address soft tissue in fossils, and mine will more thoroughly introduce our new theory of biological design.

ICR Discovery Center

We crossed the 44,000-visitor threshold in 2024, of which about 46% were under 18 years of age. We released our third planetarium show, *Mission Solaris*, and another show and new exhibits oriented toward younger people are in the works. Educational events like the Biblical Archaeology Conference with Drs. Scott Stripling, Randall Price, and Jim Johnson focused on the Lord Jesus' life. We continue to minister primarily in the Dallas–Fort Worth area, but we attract people nationally and internationally. We would love to see you here!

Wrapping Up

We believe that it's in the best interest of creationists for ICR to build a broader base of cooperative relationships. We were delighted to collaborate with nine other ministries, including Dr. Jobe Martin of Biblical Discipleship Ministries, Mr. Mike Riddle of Creation Training Initiative, Logos Research Associates, and the Creation Research Society.

While we celebrate our successes, our staff strives toward continuous improvement, both professionally and personally. Even the chairman of our board of trustees, General Mark Shackelford, began a monthly series of character-building talks in our regular staff chapel meetings. His series covers character traits such as attentiveness, meekness, truthfulness, forgiveness, resourcefulness, and punctuality—topics that seem to be rarely discussed nowadays.

That covers many of the highlights for 2024. What a year it was! It's exciting to see how the Lord Jesus uses ICR to advance creation science. Dr. Henry Morris used to always add that "ICR finished the year in the black." So, we deeply thank you for these gifts and for the many who regularly pray for ICR in their daily devotions. We depend on the Lord Jesus for scientific insights, creativity in our communications, and spiritual protection for the ICR family.

We look forward to 2025 together with you.

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Dr. Guliuzza is president of the Institute for Creation Research. He earned his doctor of medicine from the University of Minnesota, his master of public health from Harvard University, and received an honorary doctor of divinity from Southern California Seminary. He 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 and holds a B.A. in theology from Moody Bible Institute.

JANUARY 17–19

Naples, FL
Grace Lutheran Church
Foundations of Creation Conference
(T. Clarey, B. Thomas)
ICR.org/NaplesFL or 214.615.8325

FEBRUARY 2–5

El Paso, TX
Cielo Vista Church
Back to Genesis Conference
Registration is required for this event.
(R. Guliuzza, T. Clarey, B. Thomas, E. Steele)
ICR.org/ElPasoTX or 214.615.8306

FEBRUARY 22

Rocklin, CA
Jessup University
Genesis Apologetics Conference
Registration is required for this event.
(R. Guliuzza)
GenesisApologetics.com or 844.743.6374

GENESIS apologetics

SAVE THE DATE

MARCH 2

Anaheim, CA
Magnolia Baptist Church
(J. Hebert)
ICR.org/AnaheimCA or 214.615.8333

MARCH 7–9

Washington Court House, OH
Grace Community Church
Truth Matters Apologetics Conference
Registration is required for this event.
(R. Guliuzza)
GraceCommunity.net or 740.333.5433

MARCH 23

Demopolis, AL
Fairhaven Baptist Church
(F. Sherwin)
ICR.org/DemopolisAL or 214.615.8333

MARCH 28–30

Jonesboro, GA
Berachah Bible Church
(B. Thomas)
ICR.org/JonesboroGA or 214.615.8333

APRIL 4–6

Huntsville, AL
Mt. Zion Baptist Church
Unmistakable Creation Conference
Sessions for children and youth!
Registration is required for this event.
(B. Thomas, J. Hebert, J. Tomkins, E. Steele)
ICR.org/HuntsvilleAL or 214.615.8339

Unmistakable
Unveiling Jesus' Majesty in Creation

SUMMER 2025 (Dates coming soon!)

Chattanooga, TN
100 Years of Monkey Business: New Evidence Overturns the Case for Evolution
Sessions for children and youth!
Registration is required for this event.
ICR.org/ChattanoogaTN or 214.615.8306

Book your own event in 2025!

Consider bringing ICR's creation science experts to your church or group.
There are lots of ways to host one or more of our speakers.
Please send an email to **events@icr.org** for more information.

Please check **ICR.org/events** for the most up-to-date event information. If you have questions about a specific event, please send an email to **events@icr.org** or call **800.337.0375** and press 6.

UPCOMING EVENTS AT THE ICR DISCOVERY CENTER

1830 Royal Lane, Dallas, TX 75229
For more information visit
ICRDiscoveryCenter.org/Special-Events,
email **discover@icr.org**, or call **800.743.6374**.

JANUARY 18

Made in His Image Seminar

Dr. Randy Guliuzza of the Institute for Creation Research

Mr. Jay Seegert of The Starting Point Project

Join us for this annual event as we celebrate the sanctity of human life. Engage with expert speakers and discover powerful, science-based defenses for the value of life.

Register at **ICRDiscoveryCenter.org/Special-Events**.

JANUARY 28–30

Homeschool Days

The Institute for Creation Research, Creation Quest, and American Journey Experience

Attend this special event designed just for homeschool families! Enjoy educational presentations, fun activities, and discounts for the whole family.

FEBRUARY 17

Presidents' Day

Spend your day off at the ICR Discovery Center! Enjoy an educational presentation, participate in special activities throughout the day, and take advantage of a 20% discount on all tickets.

MARCH 11–15

Dinosaur Week

Dive into an exciting week of full-scale fossil exhibits, interactive group activities, captivating presentations, and discounts for everyone!

JUNE 10–13

Christian Educators Conference

Mike Riddle, Dr. Anthony Silvestro, and Scott Weckerly of Creation Training Initiative

Don't miss out on this multiday conference designed to equip Christian educators in biblical apologetics. Registration is required for this event.

Visit **ICRDiscoveryCenter.org/Special-Events** for more details.

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THEODORE ROOSEVELT NATIONAL PARK

Testimony to the Receding Flood

TIM CLAREY, PH.D. AND MIKE MUELLER, M.S.

Oxbow Bend, Theodore Roosevelt National Park, North Dakota
Image credit: USDA

article highlights

- The pancake bedding in President Theodore Roosevelt's namesake park required extensive water flows to spread the thin sedimentary layers for hundreds of miles.
- The Missouri River is far too small to have created the park's flat-top landscape. Only a profound amount of water could've done it.
- Massive water flows were needed to spread out the vegetation that formed the park's remarkably flat coal (lignite) beds.
- Petrified tree stumps are clear evidence of violent floodwaters ripping up trees and depositing their rootless stumps in the park.
- Theodore Roosevelt National Park provides strong evidence for the Genesis Flood.

Rootless fossil tree stump
Image credit: Joel Kautt

Theodore Roosevelt's Maltese Cross Cabin is located behind the TRNP South Unit Visitor Center
Image credit: Acroterion, CC BY-4.0

Nestled next to Medora, North Dakota, and 45 miles east of Glendive, Montana, Theodore Roosevelt National Park (TRNP) consists of three separate units. The North and South Units are 68 miles apart with the Elkhorn Ranch Unit in between. All total, the park encompasses 70,446 acres.[1] It was established in 1947 as a national memorial to President Roosevelt for people to experience his beloved North Dakota badlands and early ranching days.

Theodore Roosevelt first came to the Dakota Territory in 1883 to hunt bison. A year later, after his mother and first wife had both died, he returned as a cattle rancher and established the Maltese Cross and Elkhorn Ranches.[1] Although the ranches ultimately failed, he credited his time in the Dakotas as the basis for his becoming America's "conservationist" president.

In 1906, he signed the Antiquities Act, establishing 18 national monuments with Devils Tower as the first. He was also instrumental in creating five national parks and 150 national forests, ultimately protecting over 230 million acres of federal land.[1] In 1918, he said, "I never would have been President if it had not been for my experiences in North Dakota."[1]

Theodore Roosevelt's Mount Rushmore sculpture, South Dakota

Formed by the Global Flood

TRNP consists of a vast badlands landscape of flat-topped hills and isolated buttes. The sedimentary rocks in the park are members of the late-Flood (Cenozoic) Fort Union Group and contain mudstone, volcanic ash, sandstone, and lignite (low-grade coal).[2] Conventional geologists claim these rocks were deposited by a series of rivers, swamps, and lakes long after the dinosaurs went extinct.

But this interpretation doesn't explain what visitors see at the park. Instead, four observations testify that the receding waters of the global Flood were instrumental in the creation of the rocks and the landscape at TRNP.

1. Extensive Pancaked Bedding

The stacked sediments in the park are beautifully colored individual beds that extend as far as the eye can see. What river system today spreads thin layers of sediment, many a few feet thick or less, over such vast areas, stacking them like pancakes? Rivers carve channels, but we don't see many channels cut into these layers.

Only broad and extensive flows of water can spread the thin layers we observe in TRNP. Plus, many of the beds contain ripples, cross-beds, and evidence of soft-sediment folding and slumping.[2] All of these features tell us the sediments were deposited quickly by fast-moving water. A better interpretation is that these rocks were laid down during the receding phase of the Genesis Flood.[3]

Pancaked layers
Image credit: Joel Kautt

Stacked ripples in sandstone
Image credit: Joel Kautt

2. Planation Surfaces and Badlands

TRNP is surrounded by the fairly featureless Dakota Prairie Grassland. There are also many flat horizons within TRNP called planation surfaces. These surfaces are interrupted by isolated buttes and flat tops. The park's interpretive signs describe the Little Missouri River and its tributaries eroding the soft sedimentary layers of the northern Great Plains over thousands of years. And they claim that the river, wind, ice, and plants continue their erosive action today.[4]

But the Little Missouri River is too small and carries much too little sediment to create the present topography. In addition, the eroded material has been completely removed from the region, leaving the featureless grasslands around the park. A lot of water flow is needed to plane off the tops of hills and wash the sediment completely away. The receding water of the Flood 4,500 years ago is a better choice to have constructed the landscape at TRNP.

Flat-topped bluffs
Image credit: Joel Kautt

3. Flat Coal Beds Proclaim the Flood

Along the South Unit's scenic loop trail are sites like Coal Vein Trail and Scoria Point Overlook. These reflect the many thin lignite (coal) beds within the sedimentary deposits of the park. Scoria, sometimes called clinker, is a term used for rocks altered by the heat emitted when adjacent coal layers get cooked underground. Many lignite beds were ignited by lightning strikes. Scoria is often dark red or black and is bubbly-looking.

The conventional interpretation says the coal in TRNP was deposited millions of years ago when this area was a swamp. But the near perfectly flat tops and bottoms of the coal beds tell a different account that supports the biblical Flood. Real swamps, where plants grow in place, show roots protruding downward, disrupting the bottom of the layers. Instead, these flat-

Lignite (coal) beds
Image credit: Joel Kautt

bottomed lignite beds were caused by the transportation of massive vegetation mats torn loose from pre-Flood lands by the Flood. They were immediately buried and compressed by mudflows, volcanic ash, and sand slurries into the flat layers we observe.

4. Petrified Forest, a Biblical View

The Petrified Forest Trailhead sign tells visitors that

> Sixty million years ago, this land looked similar to today's Florida Everglades. Abundant water and a warmer climate promoted the growth of large trees. Giant petrified stumps and logs are remnants of this ancient wetland.

As with most park interpretations, the sign gets some things right, but the Genesis Flood is a better explanation. Trees that are very similar to today's bald cypress, magnolia, and sequoia are found as rootless stumps and branchless logs all along the trail. Many are in a near-upright position.[2] But the trees were clearly transported by water, like the material that makes up the lignite beds was. They did not grow in these positions or they would still have their roots embedded in the layers below.

Instead, these trees were torn loose from where they grew, transported by floodwaters, and deposited rapidly. Gravity pulled the heavier ends down when they settled. These tree remnants were likely carried by massive sediment flows draining off the pre-Flood uplands to the north.[3] Dissolved silica in groundwater from the volcanic ash layers led to their fossilization, replacing the original tissues and making petrified wood.[5]

ICR Director of Research and geologist Dr. Tim Clarey stands by an upright fossil tree stump
Image credit: Joel Kautt

Rootless fossil tree stump
Image credit: Joel Kautt

Conclusion

Theodore Roosevelt National Park showcases layers of exposed sedimentary rock, fossil trees, and other features that are well-explained by the Flood of Noah that occurred about 4,500 years ago. This global cataclysmic event accounts for the deposition of the thin and extensive layers, lignite beds, and tree stumps within the park. And the flat-topped buttes, the fairly featureless grasslands, and the rugged badlands topography reflect the erosive power of the receding floodwaters. Even energy resources, like the coal beds at TRNP and elsewhere, are leftovers from this horrible judgment.

Although God destroyed the pre-Flood world, He preserved life on the Ark and provided all of the resources necessary for humanity to flourish after the Flood. And He set His rainbow in the clouds as a sign of His covenant to never again destroy the world with water (Genesis 9:12–16).

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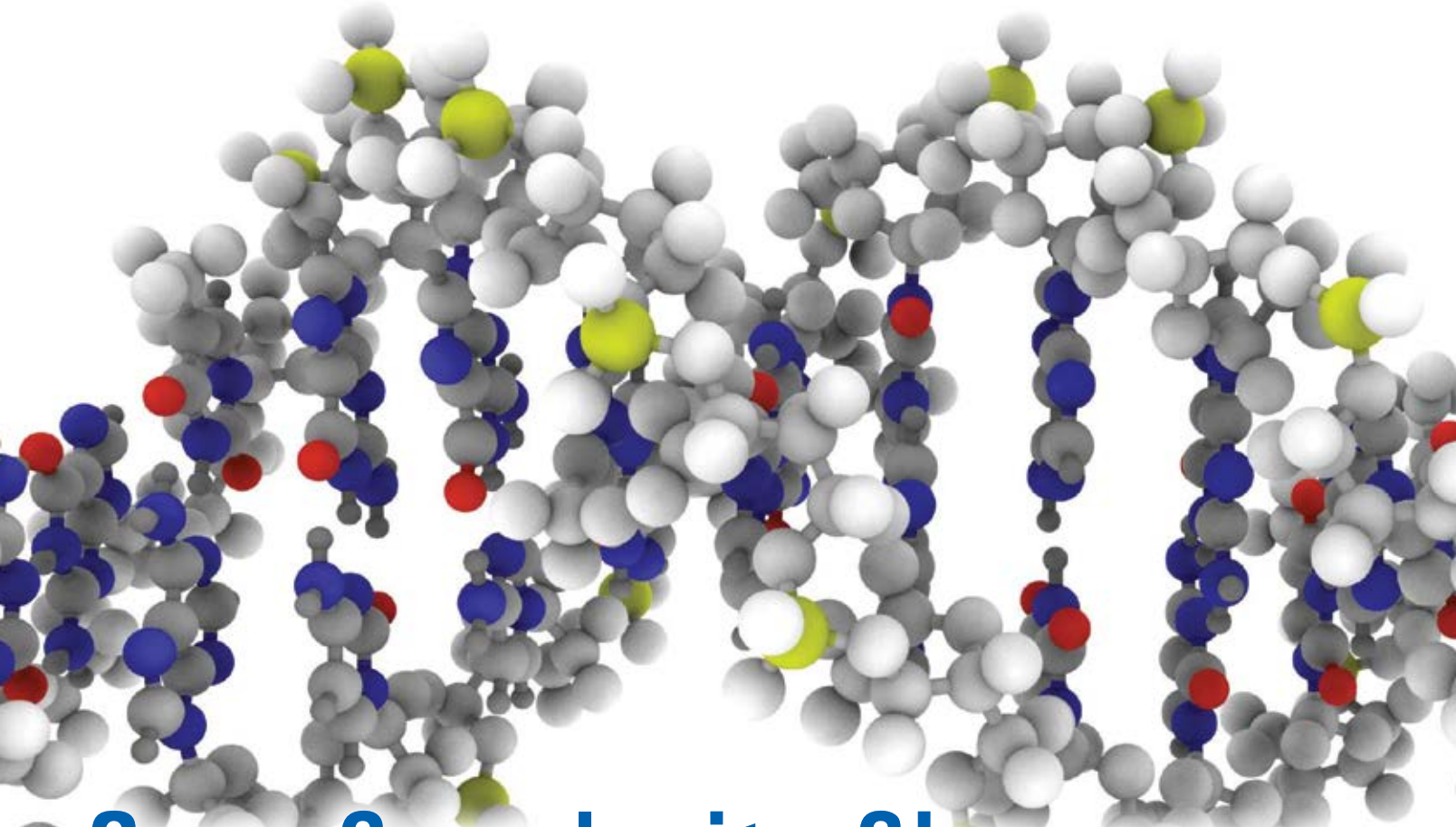
Dr. Clarey is director of research at the Institute for Creation Research and earned his Ph.D. in geology from Western Michigan University. Mr. Mueller is president of the Institute for Biblical Authority and earned his B.S. and M.S. in biology education and natural resource/wildlife management from Pittsburgh State University.

JEFFREY P. TOMKINS, PH.D.



Gene Complexity Showcases Engineered Versatility

In the early days of molecular genetics in the 1960s and '70s, researchers widely held that a gene could be defined as a single, discrete entity that encodes the information to make a protein. However, as genetic research has progressed and even exploded, so has our understanding that a gene is incredibly more complicated than this.[1] Its highly engineered complexity utterly defies the Darwinian dogma of mutation and selection.

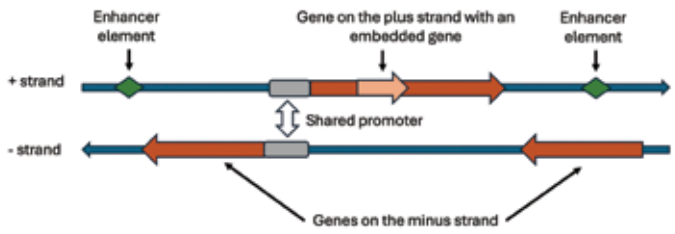
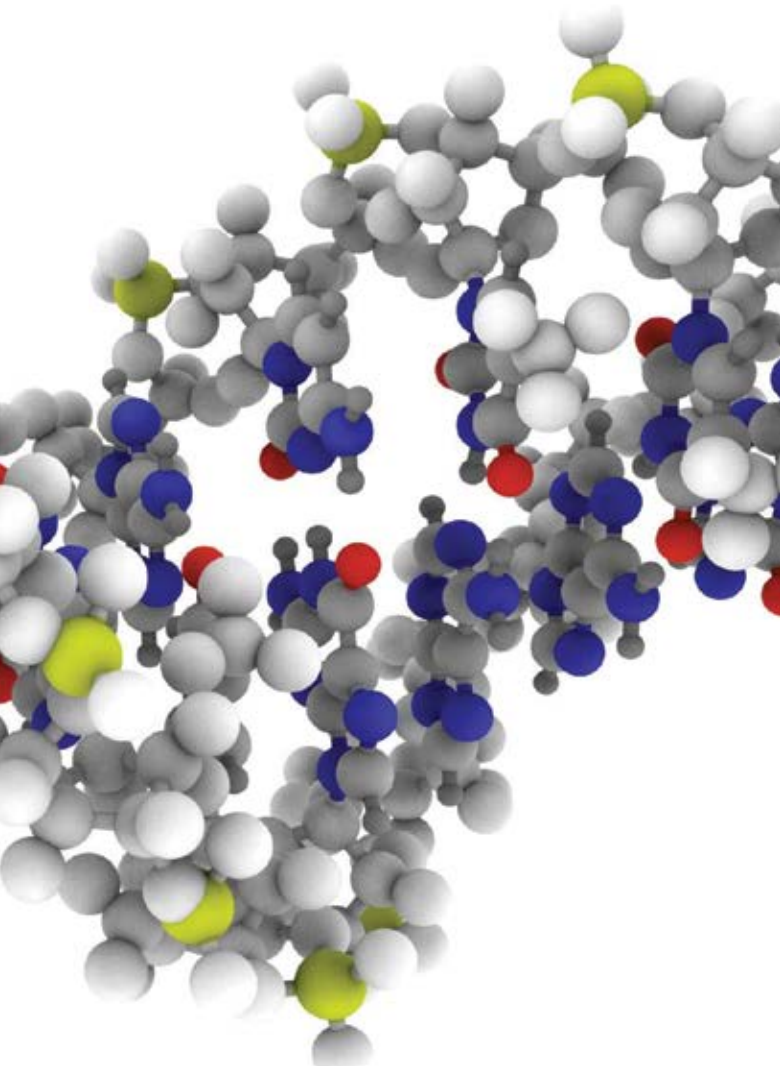


Figure 1. *Diagram showing genes on opposite strands of the double-stranded DNA molecule. The arrows indicate direction of transcription.*

An Introduction to Gene Complexity

Genes are found on both strands of the double-stranded DNA molecule (Figure 1). Their complexity has many facets. First, the boundaries of what can be called a single gene and its complete set of functions are becoming increasingly hard to delineate. Entire chromosomes and genomes are a continuum of pervasive and overlapping transcription (copying DNA into RNA).[2,3] Recent discoveries have revealed that the genes of many plants and animals are not like single entities at all but are a mixture of genes within genes and even genes that overlap each other (Figure 1).[3] The regulatory control regions of genes, called promoters, can be shared by two completely different genes whose transcriptions run in opposite directions from each other.

Enhancer (regulatory) elements that also play an important role in regulating gene function can be up to a million bases away from the gene they regulate. As if this weren't enough, many genes function both forward and backward at the same time, producing both



article highlights

- DNA sequencing has shown that the human genome is far more complex than scientists first thought.
- Alternative splicing allows a single gene to produce a variety of proteins, each with a separate and important function, which further multiplies the biocomplexity of the human genome.
- In light of such intricate and elegant bioengineering, a Darwinian belief that random mutations and mystical natural selection can drive increasingly higher forms of life becomes more and more untenable.
- Only our all-knowing Creator, Jesus Christ, is capable of engineering the incredible life we see on Earth.

sense and antisense transcripts.[4] The regulatory sequences of genes can also be located inside other nearby genes, and researchers have determined that genes dynamically interact with each other in "gene neighborhoods" much more than previously believed, to the point of blurring the boundaries between them.

Second, the informational output provided by genes can change depending on different circumstances that include cell type, tissue type, and other stimuli such as the external environment.[5] In the genome, both the DNA molecule itself and the histone proteins that the DNA molecule is packaged around can be chemically altered or tagged. The study of these chemical tags is called epigenetics or chromatin remodeling.[5,6] In addition to genes having overlapping boundaries and alternate functions, the information the genes provide is epigenetically altered by the cellular machinery to allow just the right output for the situational need at hand.[5]

When evolutionists talk about creatures sharing the same genes, they are typically referring to very small segments of the genes' DNA. And in most cases, they specifically mean the protein-coding segments inside genes called exons—not the whole segment of DNA that is actually responsible for producing the information needed to make the correct version of the protein and RNA specific to each creature kind at the right time and in the correct amount.

But what about all the other expressed DNA sequences in the genome besides protein-coding segments? Can they be called genes, too? Amazingly, there are more than twice as many long non-coding RNA (lncRNA) genes in the human genome as there are protein-coding genes.[2,3] These lncRNA genes produce long RNAs that are used either structurally or functionally in the cell for many different purposes. In fact, many of these are turning out to be molecules that control and regulate protein-coding genes.[7,8]

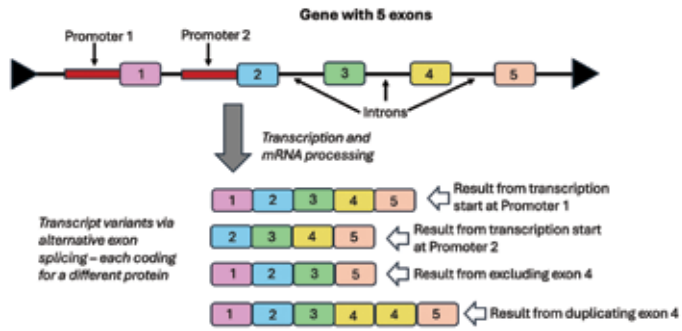


Figure 2. *Diagram illustrating alternative splicing of a gene*

Alternative Splicing

Since the first viral gene was sequenced at the beginning of the modern genomics era about 40 years ago, the concept of what comprises a gene and how it works has changed markedly.[1] In the ensuing time, entire microbial, plant, and animal genomes have been sequenced.

When research into gene function began, researchers widely assumed that a one-to-one relationship existed between genes and their RNA and protein products. However, genome sequencing projects soon revealed that the large number of RNAs and corresponding proteins being discovered were hundreds of times more numerous than the number of genes found in the DNA sequence.

We now know that this is due to the many complex mechanisms associated with gene function. In plants and animals, a gene typically produces a messenger RNA (transcript) from multiple segments of coding DNA in a gene region (Figure 2). These coding segments are called exons, while the non-coding segments (introns) are spliced out as the RNA is processed (Figure 2). A single gene region can produce a variety of transcripts by adding, multiplying, or eliminating exons in a process called alternative splicing (Figure 2).[9] For example, a mere three neurexin genes in humans can produce over 3,000 different transcripts.[10]

Scientists deduced a predictive model for the splicing code of many genes that has been able to predictively account for about 80% of the transcriptional output of the genes that were studied.[10] This model employed a diverse set of factors and analyzed the alternative splicing across 27 different mouse tissue types.[11] In brief, researchers discovered that the splicing code model involves:

1. diverse regulatory DNA sequences functioning as control features located throughout gene regions,
2. complex interconnections between genes and gene networks,
3. dynamic regulation of three-dimensional chromosome architecture,
4. the interplay of DNA chemistries and conformational features,
5. cell tissue type and physiological state, and
6. the effects of DNA sequence variation within populations.[10]

Even these categories can be further broken down into subfields of study.

Long Complex Gene Tails

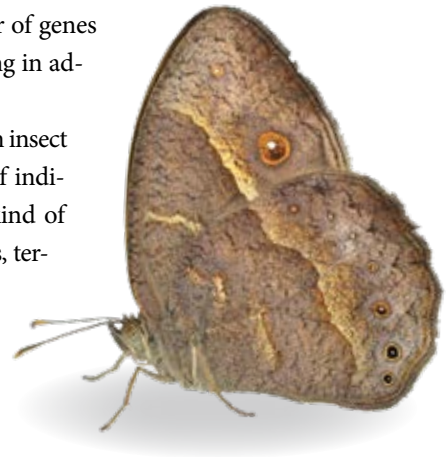
If the picture of gene regulation and splicing were not complicated enough, a very interesting study increased this paradigm to an unprecedented level.[12] Performed in both mice and humans, this study showed that not only are a gene's exons alternatively spliced but so is the sequence called the 3-prime untranslated region (3' UTR) that's tagged on to the end of a gene like a tail.[12] This 3' UTR tail does not code for proteins but instead contains a variety of genetic switches that help enable the gene to be regulated after it is transcribed.

Some of these 3' UTR gene tail features allow regulatory RNA-binding proteins to attach to the mRNA's tail, while others allow small regulatory RNAs called microRNAs to bind.[12,13] The combination of these bound regulatory molecules fine-tunes and robustly controls genes after the mRNAs are produced. This form of regulation is called post-transcriptional because it happens after the mRNA is transcribed. And like the coding areas of the gene, these 3' UTR tails are also alternatively spliced and thus variable. Their size and makeup can vary widely and dynamically between mRNAs from the same gene and between the different cell types in which they are found.

While scientists knew about the diversity of 3' UTRs gene tails before this study, they discovered that this feature was on a much more intricate and massive scale than they anticipated. In fact, they identified 2,035 mouse and 1,847 human genes that have 3' UTR tails ranging from 500 to 25,000 bases long. In some cases, they were even longer than the protein-coding areas of the genes themselves. These incredibly long gene tails literally contain hundreds to thousands of genetic switches within each single mRNA. The complexity of genetic control at this level astounds researchers.

Alternative Splicing and Adaptation: Insects

Many past studies connect gene expression levels to various types of adaptation in plants and animals in response to environmental changes. However, most looked at the quantity of mRNAs produced from certain genes and the alternative activation of different genes, not alternative splicing. In recent years, several studies done with insects and vertebrates have shown that a number of genes undergo alternative splicing in adaptation.[14]



Bicyclus anynana
Image credit: Gilles San Martin, CC BY-SA 3.0

One example is within insect castes, which are groups of individuals within the same kind of social insect (e.g., ants, bees, termites) that have a different bodily appearance that's typically related to the role of the caste within the colony. For example, members of the soldier caste in a colony of army ants are larger than the others and have huge jaws. The number of individuals in each of the insect castes can vary adaptively with environmental variables such as external threats to the colony.[14]

Comparative analyses between insect colonies indicate that alternative splicing is a contributing factor to caste differences in termites, honeybees, and potentially ants. In the bumble bee, 40% of genes express multiple mRNA splicing isoforms, with many being caste specific.[15] In nonsocial insects that don't have castes, alternative splicing has also been found to play a role in the seasonal plasticity of wing pattern variation in the butterfly *Bicyclus anynana*.[15] This butterfly is one of many insect kinds that adaptively varies its coloration scheme depending on the season.[15]

Alternative Splicing and Adaptation: Vertebrates

Reptiles are another group of creatures that adaptively interact with their environment. At temperatures below 26°C, a temperature-

sensitive regulatory enzyme in turtles called a kinase modifies a group of RNA-binding proteins that regulate splicing.[16] This kinase-driven modification leads to a group of RNA-binding proteins that are translocated from the cytoplasm to the cell nucleus. Here they activate a set of regulated alternative splicing events that cause the development of male turtle embryos. Above 31°C, the kinase becomes inactive, leading to alternative splicing events that promote female development. At intermediate temperatures, a mixture of both sexes will develop.

Macro overland turtle

Adaptive alternative splicing has also been observed in fish. In the salmonid fish called Arctic char there exist benthic (deep-water dwelling) and pelagic (near-surface dwelling) ecotypes of the same species across multiple independent lakes.[17] These two different ecotype adaptations are characterized by differences in swimming ability resulting from alternatively spliced genes that produce regulatory proteins that are top-level regulators of specific gene networks.

Similarly, researchers also documented this type of adaptive response in a cichlid fish where rapid ecological adaptation along depth gradients was discovered in Lake Masoko, an African crater lake.[18] The cichlid *Astatotilapia calliptera* has diversified into pelagic and deep-benthic ecotypes with strikingly different jaw structures. Between the two ecotypes, researchers identified 7,550 genes with alternative splicing. About 15% of those genes were associated with craniofacial development leading to different jaw forms. The researchers reported that alternative splicing played a large role in "driving ecologically relevant divergence in gene expression during adaptive diversification."[18]

An example of adaptive splicing in mammals is the house mouse. In a recent study, researchers studied mice in a latitude gradient on the East Coast of the United States.[19] Mice were sampled in Florida, Georgia, Virginia, New York, and New Hampshire/Vermont. As is true with Bergmann's rule,[20] in Eastern North America mice in colder environments are physically larger, build bigger nests, differ in metabolic traits, and show differences in gene expression compared to mice from warmer environments.[19]

In the mouse study, researchers specifically looked at differences in alternative gene splicing. The analyses identified a small set of alternatively spliced transcripts correlated with environmental adaptation. Many of these alternatively spliced genes were connected to traits associated with body size, which was observed to gradually increase with latitude. Interestingly, there was no overlap between previously identified genes that were associated with changes in mRNA abundance. These results indicate that alternative splicing and changes in mRNA abundance are separate molecular adaptation mechanisms.

Conclusion

With each passing year, research into the inner workings of the genome reveals ever-deepening levels of intricately engineered processes, especially as they relate to gene complexity. To quote Dorothy from the classic movie *The Wizard of Oz*, "I've a feeling we're not in Kansas anymore." In fact, the biocomplexity of the genome is now reaching proportions beyond our wildest imaginations and even our ability to understand.

Most importantly, the naïve simplicity of the Darwinian paradigm of random mutations operated on by a mystical selective agent is clearly falling apart in the face of such vast, complex, precise, and elegant bioengineering. Only our omnipotent and all-wise Creator, the Lord Jesus Christ, is capable of providing a sane and viable answer to the origin and operation of life on Earth.

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Dr. Tomkins is a research scientist at the Institute for Creation Research and earned his Ph.D. in genetics from Clemson University.

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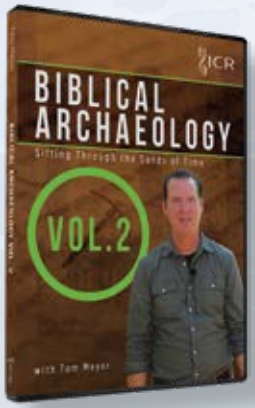

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JAMES GADBERRY

The Courage of Conviction

Several years ago, a young pastor assumed leadership of his father's church. The church was located in a large city with an increasing population and technological advancements. Feeling the pressure of his new position, the pastor prayed, "Lord, help me to be perceived as intelligent and wise to this fast-growing city of mostly nonbelievers."

His thoughts stopped him. "How am I going to communicate that I follow a man who created the heavens and the earth, was born of a virgin, walked on water, and conquered death and not be perceived as foolish?"

This question presents a familiar crossroad for many pastors worldwide. They ask themselves, "Do I continue to trust what the Bible says? Or do I conform to this world and deconstruct Scripture to teach a more palatable message?" While most church leaders know the correct path, some lack the courage to voice their conviction.

In John 5, Jesus doesn't shy away from proclaiming the truth—even as He's being persecuted by those who seek to kill Him. On the contrary, He actually doubles down: "Most assuredly, I say to you, he who hears My word and believes in Him who sent Me has everlasting life" (v. 24). This would've been a perfect opportunity for Jesus to pacify His accusers and escape. Instead, He boldly proceeds with a fourfold witness of Himself. He first references John the Baptist's foretelling of the coming Messiah. Then, He presents God the Father, who sent and testified of His Son. God's Word is the third witness, but Christ's accusers don't recognize eternal life in Him. Finally, He cites a witness that the Jewish leaders can't deny. "For if you believed Moses," said Jesus, "you would believe Me; for he wrote about Me" (v. 46).

As a former pastor, this verse represents a standard that I won't ignore. I can either accept all of Scripture or none—and that includes Genesis.

The Bible's opening verse says, "In the beginning God created the heavens and the earth" (Genesis 1:1). The beauty of simplicity is masterfully displayed as God (*Elohim*, the plural name for God in Hebrew) through His Word introduces Himself to man as Creator. Later, John begins his gospel in agreement with Moses and the book of Genesis:

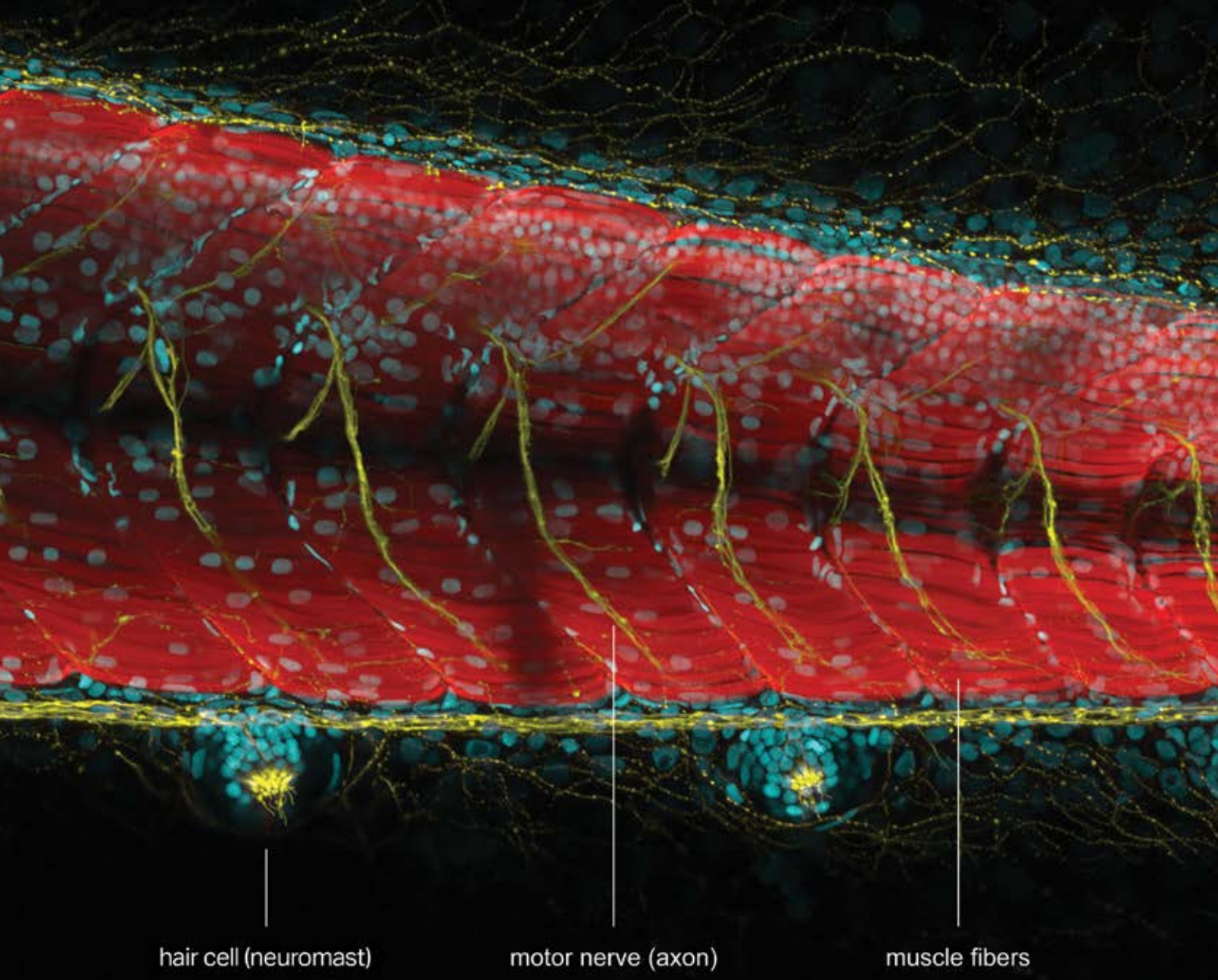
> In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things were made through Him, and without Him nothing was made that was made. (John 1:1–3)

The enemy, however, wants nothing more than to obstruct mankind from knowing the Lord Jesus Christ. As the father of lies (John 8:44), he persuades the creation to deny its Creator—and to hesitate to share His truth.

At the Institute for Creation Research, we seek to equip the church to be bold ministers of God's Word. ICR's resources—books, magazines, podcasts, and more—provide scientific responses to secular attacks on biblical inerrancy. As we begin this new year, we renew our mission to help pastors lead, feed, and defend their flocks in the midst of today's societal pressures.

Thank you for your support of ICR's biblical creation ministry. For over 55 years, our research has demonstrated how science truly affirms Scripture. Your financial gifts make this possible. Together, we're making an eternal difference, and we believe the best is yet to come.

Mr. Gadberry is interim director of development and donor relations at the Institute for Creation Research.



"All flesh is not the same flesh,
but there is one kind of flesh of men,
another flesh of animals, another of fish,
and another of birds."

— 1 Corinthians 15:39 —

Lateral view of mid-tail region in a surface fish of **Astyanax mexicanus** *(cavefish). Features include myotomes with muscle fibers (red), DNA in cell nuclei (cyan), and nervous connections to muscles and neuromast sensory organs (yellow).*

Image credit: The William B. Dean, MD Imaging Center of the Institute for Creation Research

JAMES J. S. JOHNSON, J.D., TH.D.

Mice That Prey on Scorpions and Tarantulas

Don't underestimate the ferocity of a humble-looking little mouse—especially if it lives inside Grand Canyon.

Although various mice inhabit Grand Canyon, the fiercest hunter among them is *Onychomys torridus*. In grasslands where grasshoppers graze and gambol, *Onychomys* mice are routinely called grasshopper mice. But in deserts where scorpions stalk and sting, they're often called scorpion mice. Grand Canyon has its share of both, and *Onychomys* mice have lots of canyonland food options that allow them to do well in either environment.[1]

Eating grasshoppers sounds straightforward. *Onychomys* mice claws can quickly grab their jumping-too-late prey. Eating scorpions, on the other hand, is a lot trickier. How has God equipped *Onychomys* mice to combat the lethal venom of Grand Canyon's scorpions such as the copper-colored Arizona bark scorpion (*Centruroides sculpturatus*)?

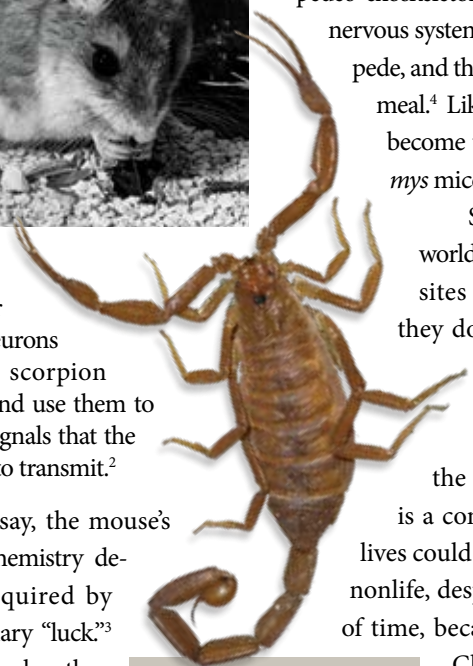
Arizona bark scorpions are the most venomous scorpions in North America. Their poison works via neurotoxic envenomation, which disrupts the nervous system by interfering with the transmission of nerve signals. This can cause mixed symptoms that include severe fiery pain, heartbeat irregularity, fever, elevated blood pressure, numbness, double vision, and difficulty breathing.

> The Arizona bark scorpion…[by] its sting can kill a human infant or young child.…Bark scorpions produce toxins that bind to sodium (Na^+) and potassium (K^+) ion channels in nerve and muscle tissue, producing hyperexcitable cells that disrupt normal physiological functioning in the neuromuscular and peripheral sensory systems.[2]

However, *Onychomys* mice are not only immune to bark scorpion venom toxins, but their bodies also amazingly convert those pain-stimulating toxins into the opposite: pain-blocking analgesic!

> Yet grasshopper mice eat [bark scorpions] with impunity.…In fact, instead of inducing pain in grasshopper mice,… the ion channels in grasshopper mice sensory neurons bind [the bark scorpion venom] toxins and use them to block the pain signals that the venom is trying to transmit.[2]

Scorpion mouse
Image credit: U.S. Department of Energy, Public domain



Centruroides sculpturatus
Image credit: Andrew Meeds, CC BY-4.0

Needless to say, the mouse's table-turning biochemistry defense was *not* acquired by mindless evolutionary "luck."[3] Only the Lord Jesus has the infinite genius and bioengineering skill to design and install that ability into those mice.[3]

Meanwhile, you should also pity the deadly, venomous Arizona desert centipede *Scolopendra heros* when it has the misfortune to encounter a night-hunting *Onychomys* mouse. In the ensuing battle, the mouse continuously tracks and quickly dodges the centipede's clawing movements. Evading the centipede's waving forcipules (fang-like, venom-injecting appendages), the mouse repeatedly bites into the centipede's exoskeleton, demolishing its central nervous system. This paralyzes the centipede, and the mouse can then finish its meal.[4] Likewise, hunting tarantulas become the hunted when *Onychomys* mice attack.[2]

Scripture tells us that this world is *fallen*. That's why parasites and predators do what they do. But one day predation and death themselves shall die (1 Corinthians 15:26). Until then, the fallenness of this world is a constant reminder that our lives could never have evolved from nonlife, despite an imagined infinity of time, because only the Lord Jesus Christ can give or sustain life in this world.[3]

And that's true even for the humble-looking, fierce mice of Grand Canyon's inner gorge.

article highlights

- The scorpion mouse lives in Grand Canyon and hunts—you guessed it, scorpions.
- This ferocious predatory mouse possesses a remarkable biochemical ability: ion channels in its sensory neurons bind a scorpion's toxin and render it harmless.
- The mighty mouse's menu also includes dangerous centipedes and tarantulas.
- These unique hunting abilities require profoundly complex traits that could not have evolved through chance processes.

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Dr. Johnson is the associate professor of apologetics and chief academic officer at the Institute for Creation Research.

My teens did the eye roll when I told them we were going to a museum while we were visiting Dallas. They walked out of the ICR [Discovery Center] museum awestruck and talked about how wonderful it was for days.

— T. F.

Editor's note: We invite you to visit the ICR Discovery Center if you'll be in the Dallas area. It's an experience you won't want to miss. Go to **ICRDiscoveryCenter.org** for more information.

I read and enjoy *Days of Praise* daily. I have read other devotionals, but they all seem to fall short. *Days of Praise* always delivers an uplifting message that blesses my heart and encourages my walk. I thank you from the bottom of my heart for this light which shines in the midst of the great darkness. May God give you strength and perseverance to continue faithfully to proclaim the Lord Jesus Christ in truth.

— D. L.

Many, many thanks for all you do. ICR is impacting three generations in this family! Praise the almighty King.

— S. R.

ICR is a ministry worth supporting! Love *Acts & Facts*. Have kept all my magazines. They are rich with truth and reasons to be in awe of God almighty, Jesus, [and the] Holy Spirit forever.

— L. L.

I am so thankful to be able to support ICR even in this small way. Your recent letter of thanks was a wonderful reminder of how creation itself speaks of God and praises the Lord Jesus Christ. I don't know how all the enemies of Christ and ICR online cannot see and know the presence of God and His Word in the universe. Thank you, and God bless the continual labor of your minds, hands, feet, and mouths proclaiming Him to the uttermost parts of the earth.

— D. B.

Editor's note: We appreciate your support of ICR's work. God has been so faithful to provide through people like you. God bless.

I love hearing these testimonies [on *The Creation Podcast*]. Dr. Henry Morris came to our little college in the fall of 1974…and spoke every evening for a week. I attended every session, and it was like light bulbs going off. I'd only been a Christian for a few months and hadn't really thought deeply yet about the implications of evolution as I'd learned it in the public schools as contrasted with the Bible account. But Dr. Morris's presentations made me think about it, and it greatly strengthened my walk with the Lord.

— K. A.

These podcasts are some of the most worshipful discussions I ever listened to.

— M. B.

Editor's note: To tune in to ICR's regular podcasts, visit **ICR.org/podcasts**.

Thank you, ICR, for your witness for Jesus Christ and the verity of His Word. ICR has played a huge role in shaping my view of the Creator and His creation since the days of [Drs.] Henry Morris and Duane Gish. And your voice for truth is stronger than ever. You are on the winning team.

— C. V.

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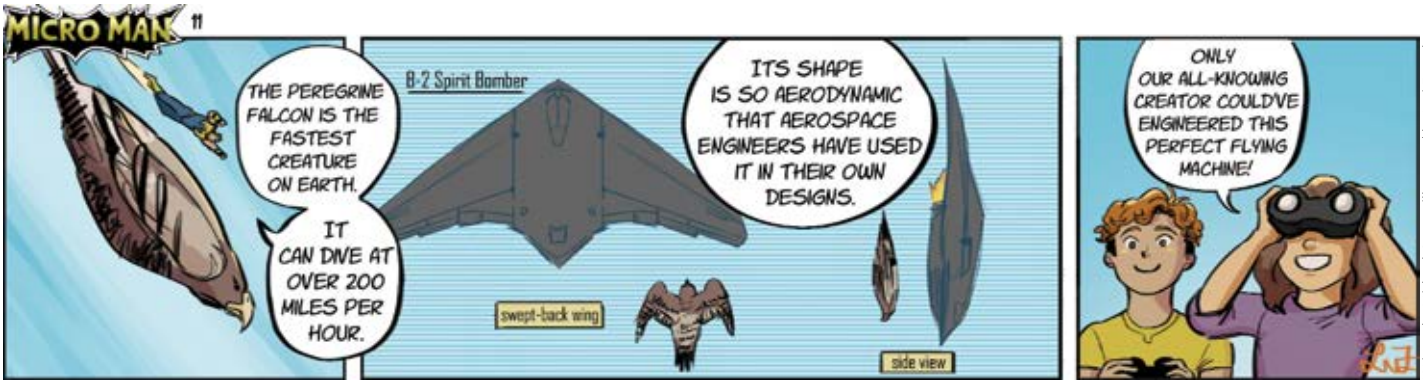

Written by Michael Stamp, illustrated by Lori Fausak

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Neptune

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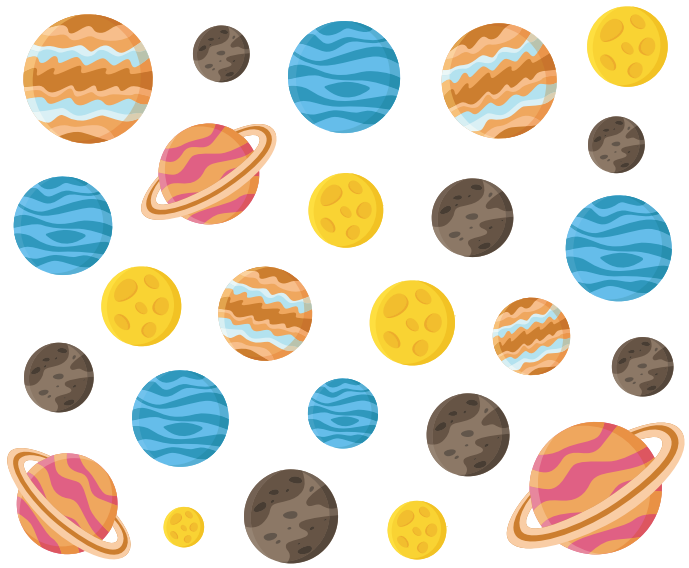
Far, far away is a planet big and blue. The farthest from the sun, it's the one and only Neptune! This freezing "ice giant" is the eighth planet in our incredible solar system. The average temperature of Neptune's gas surface is below -300°F. But believe it or not, its interior is hot! This heat is easy to explain if Neptune is only thousands of years old. Did you also know...

- God made Neptune on Day 4 of the creation week.
- It takes around 165 years for Neptune to orbit the sun.
- Neptune's methane gas absorbs red light and reflects blue, giving the planet its color. It's surrounded by rings, like Saturn, but they're very faint.
- Neptune has the strongest winds in the solar system. They can reach 1,300 miles per hour!

Count the planets. How many do you find of each?

a ☐ b ☐ c ☐ d ☐ e ☐

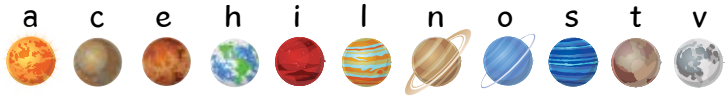


Fill in the Blanks

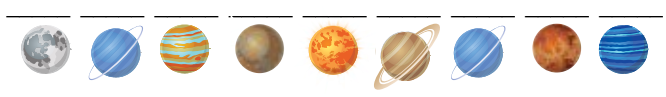
"When I consider Your _____, the work of Your fingers, the moon and the _____, which You have ordained, what is man that You are _____ of him, and the son of man that You visit him?" (Psalm 8:3–4)

Use the key below to find the answer.

a c e h i l n o s t v



What's special about Neptune's largest moon, Triton?



Answers to Count the planets: a. 3, b. 5, c. 4, d. 6, e. 7; Fill in the Blanks: heavens, stars, mindful; Code puzzle: it has volcanoes

BY RENÉE DUSSEAU AND SUSAN WINDSOR

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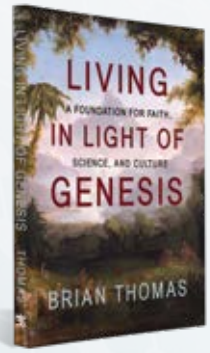

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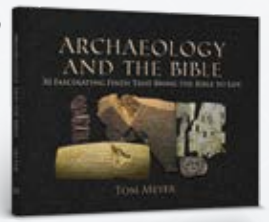

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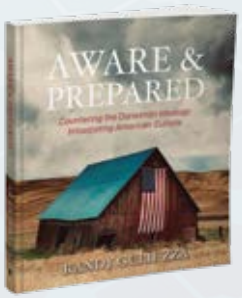

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