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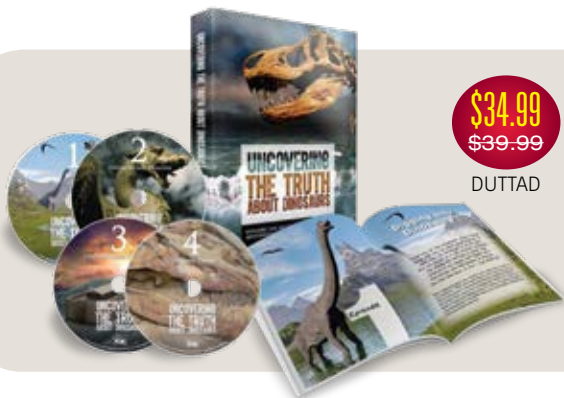
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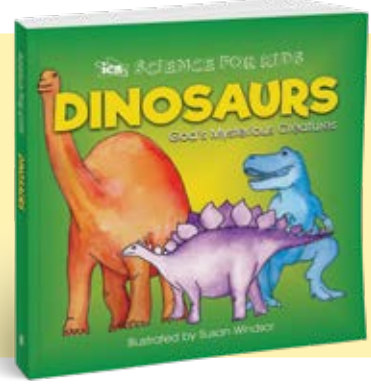
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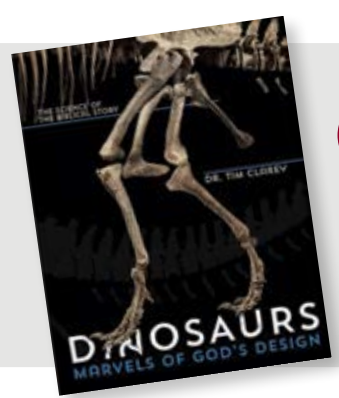
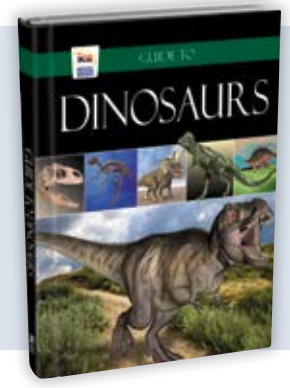
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EXECUTIVE EDITOR

Jayne Durant

SENIOR EDITOR

Beth Mull

EDITORS

Michael Stamp

Truett Billups

Christy Hardy

DESIGNER

Dennis Davidson

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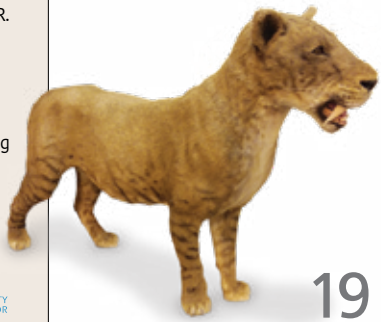
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Springtime Planning for Fall Learning

By March, educators are in the homestretch of the current school year, yet they're also busy planning for the next school year. I'd like to encourage you to consider adding ICR resources to your lineup for the fall.

I homeschooled my four children over a period of 22 years, from preschool through high school graduation. Over the years, I developed a rhythm for our school year that included March planning and attendance at spring homeschool book fairs. Many homeschoolers take the spring to map out plans for the following year's curriculum, resources, field trips, labs, group events, enrichment activities, music lessons, sports, and extracurricular activities. I can tell you, I would've loved to have the resources that ICR offers today.

If you want to take a full school year to do a multi-age-level unit study on creation, ICR provides resources for a 36-week creation unit study plan. To help you in your planning, I put together a simple one-page creation unit study outline using

ICR resources. (Download your free copy at ICR.org/homeschool.) The study outline provides a timeline and sequence of resources to help you equip not only your students but the entire family with creation science information. We've put together a pack containing these resources at a 50% discount, available March 1 through May 31, 2019 (while supplies last).

Use the resources in the order presented in the outline to build a foundation of creation basics before you tackle the more difficult topics. Throughout the year, add writing assignments, science experiments, art projects, and other activities that enhance that week's lesson and fit with your students' individual learning styles. Attend an ICR event near you, and listen to ICR podcasts to hear from our scientists and experts about the latest research (ICR.org/podcasts).

Plan to visit the ICR Discovery Center for Science and Earth History when it opens sometime this fall—you'll discover foundational creation concepts and the science that confirms biblical truth. See the latest infor-

mation about the ICR Discovery Center in Dr. Henry Morris III's feature article this month, "An Appointed Time" (pages 5-7). The Discovery Center is a field trip resource that you'll want to include in your plans many times throughout the year.

If you haven't already, subscribe to ICR's monthly *Acts & Facts* magazine. Parents and junior high (and older) students can read and explore a wide range of biblical science topics. Students can write a one-page essay per month (or each week, depending on your child's interests, abilities, and level) about one of the articles that interests them.

You certainly don't have to be a homeschooler to benefit from ICR resources. Families, churches, and small groups also use them to learn how science fits with the Bible, and we often hear about lives changed as a result of sharing them. Whatever draws you to ICR's resources, we hope you'll be blessed by the message you find!

Jayme Durant

Jayme Durant
EXECUTIVE EDITOR



AN APPOINTED TIME

HENRY M. MORRIS III, D. MIN.

article highlights

- Although God's promises often seem delayed, we can trust in His provision and timing.
- ICR is committed to teaching the next generation about biblical creation, and the Lord has richly provided for the Discovery Center under construction.
- We will not grow weary in our building effort. God is faithful and will provide.

The longer the Lord has allowed me to serve in the Kingdom, the more I have learned to trust in His sovereign timing and control over the affairs of our lives. Yes, He does insist that we “work out [our] own salvation with fear and trembling” (Philippians 2:12). But at the same time, He makes sure we know that “we are His workmanship, created in Christ Jesus for good works, which God prepared beforehand that we should walk in them” (Ephesians 2:10).

We face a troubled world. The prophet Habakkuk also lived in a turbulent time. The

northern 10 tribes had been taken captive by Assyria. Judah, where Habakkuk lived, would soon be sacked by Nebuchadnezzar and swept into exile, in fulfillment of God's warnings of judgment on His disobedient people.

But along with the warnings by Jeremiah and other prophets during those days, there were short cameos of God's promise to reestablish Israel and fulfill all His assurances of rebuilding and restoration. Habakkuk was given such an assurance, a vision of greatness and prosperity that was certainly not part of his experience. He was given a



“For the vision is yet for an appointed time; but at the end it will speak, and it will not lie. Though it tarries, wait for it; because it will surely come, it will not tarry.”

(HABAKKUK 2:3)



The ICR Discovery Center's sign is up!

promise of victory and the joy of salvation that would surely come, along with a national praise for God's glory and strength.

The vision would come, and even "though it tarries, wait for it; because it will surely come, it will not tarry." In simple terms, the promise is real, even though it seems to be delayed. God has promised it. It will come!

September 2015

My September 2015 feature article in *Acts & Facts*, "Go For It!," was written around the encouraging gift ICR received from an unexpected source. This enabled us to feel the Lord was verifying we should proceed to build the ICR Discovery Center for Science and Earth History that is now nearing completion. At that time, we had nothing much but a vision to build something that would reach many over several generations with the foundational message of a recent creation by an omniscient and omnipotent sovereign Creator.

I noted in the article that I had been hesitant to move forward with our hope to build a teaching museum and planetarium here in the DFW area, in spite of the desperate need, because the funding seemed out of reach. But with that unexpected gift and your response over the next three years, that dream is becoming a reality.

Foundational Commitment

Over the next several months, we began to focus our planning and build a foundational purpose to make what had been a vision of our hearts into a more concrete commitment. It became clear that we wanted and needed a teaching museum that would be a constant and growing resource for years to come. Psalm 78:4-7 became the theme for our effort:

We will not hide them from their children, telling to the generation to come the praises of the LORD, and His strength and His wonderful works that He has done. For He established a testimony in Jacob, and appointed a law in Israel, which He commanded our fathers, that they should make them known to their children; that the generation to come might know them, the children who would be born, that they may arise and declare them to their children, that they may set their hope in God, and not forget the works of God, but keep His commandments.

Those verses have been ICR's foundational commitment since our planning became clear. They have guided decisions on the shape of the exhibits, the content made available through the many touchscreens in those exhibits, and the planetarium presentations and short visual shows that will be available in the Discovery Center.

Groundbreaking—April 2017

It is hard to express the wonderful fellowship we enjoyed on that beautiful spring day of April 21, 2017, when we broke ground for the new center. Over 300 folks showed up to rejoice with us as we formally started construction on the plot of ground the Lord had provided over three years earlier. God's timing is never late, but our short view of life often pressures us to "get on with it" as the vision clarifies and the Lord begins to provide resources.

Perhaps we should never become "antsy," since the Lord tells us to not "grow weary while doing good, for in due season we shall reap if we do not lose heart" (Galatians 6:9). In fact, we are very clearly told: "Be anxious for nothing, but in everything by prayer and supplication, with thanksgiving, let your requests be made known to God" (Philippians 4:6).

Yet, as a project grows more complex, and the inevitable delays in any big project become known, it is normal to worry and fume about what we have very little control over. And the Discovery Center project has been no exception!

Almost from the very start of clearing the property and digging the various places for foundation support, we ran into drainage and sewage issues. Longer pipe runs, bigger detention ponds, geological mapping and soil samples that did not meet expectations, and exceptions (read change orders) became part of the decision process—with very little ability on our part to make any impact.

But the Lord never says "oops." We just have trouble resting in His sovereign oversight of even the little details. And of course, as things began to work themselves out, it became clear that the changes were all necessary for a stable and safe environment—not to mention the assurance that all of the new construction would be "stable and safe" for decades to come!

God's Provision

One of the most joyous reports we can give to those of you who have faithfully prayed and given to the Discovery Center project—and faithfully prayed and given to the everyday operational ministry of ICR—is that every nickel that has been needed so far has been provided for both the extra capital project of the Discovery Center and the ongoing ministry and mission of the Institute for Creation Research.

About 80% of the operational funds we need come from donations. Our income from books, DVDs, seminars, honorariums, etc. does not begin to cover the day-to-day operating costs of our work. Every penny of the millions that have been spent so far on the Discovery Center has come from those among our following who have given, some sacrificially, to cover the work the Lord has enabled us to do.

We still make *Acts & Facts* and *Days of Praise* available without subscription costs to any and all who ask. The magazine reaches over 250,000 every month, and the devotional quarterly booklet exceeds 500,000 every issue. Those carefully planned publications, our efforts to respond to supporters with timely letters of encouragement, and the ongoing budget for our staff are all met by the generosity of our readers. Thank you!

Going Forward to the Grand Opening

As the increasing complexity of the Discovery Center became more apparent, it was clear we would move well into 2019 before we could complete the exhibit displays and certify the many informational sources made available through the exhibit hall touchscreens. For several months we had been feeling the impact of the two axioms of capital projects: 1) It costs more than initially thought, and 2) it takes longer than initially planned.

We had hoped to be finished with



Exterior wall panel of an Archaeopteryx

the new construction by August 2018. Although it's essentially now complete, as of this writing we won't have a final conditional operational permit for the new portion—including the planetarium, resource center, and auditorium—until February. That portion is functional, and we have had and will have presentations to special groups over the next few months. But we won't have full use of the Discovery Center with all of the exhibits complete and functioning until this summer.

It will then take three to four weeks for vendors to provide the necessary training for us to “debug” everything and make sure there are no hiccups after we open to the public. That means that any official grand opening cannot take place until sometime in the fall. That's the best we can forecast from where we stand today.

Needs Yet to Be Realized

The Lord has brought in donations from well over 20,000 *Acts & Facts* and

Days of Praise readers to pay for all but about \$3,500,000 of the entire cost of this magnificent ICR Discovery Center for Science and Earth History. Please pray with us about these needs. So far, we have not had to borrow one dime. I would love to be able to open the Discovery Center without any debt. That would give us far more freedom to staff properly, open generously, keep entry and membership fees within reach of most of the Lord's family, and continue to grow as the Lord provides the guidance.

And as ever when we do the work of God's Kingdom, we must keep in mind the admonition of 1 Corinthians 15:58: “Therefore, my beloved brethren, be steadfast, immovable, always abounding in the work of the Lord, knowing that your labor is not in vain in the Lord.” ✉

Dr. Morris is Chief Executive Officer of the Institute for Creation Research. He holds four earned degrees, including a D.Min. from Luther Rice Seminary and an MBA from Pepperdine University.



MARCH

5-8

Sun Valley, CA | Shepherds' Conference at Grace Community Church (Booth only) | shepherdsconference.org

MARCH

6

Houston, TX | Houston's First Baptist Church | (T. Clarey) 713.681.8000

MARCH

9-10

Newcastle, OK | Woodland Hills Baptist Church | (T. Clarey) 405.392.5500

MARCH

22-23

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MADE IN HIS IMAGE
A Creation Apologetics Conference



Randy J. Guliuzza, P.E., M.D.



Jeffrey P. Tomkins, Ph.D.

Rush Creek Bible Church
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MARCH

24

West Olive, MI | Harvest Bible Church | (R. Guliuzza) 214.615.8325

SAVE THE DATE

JUNE

21-23

Rapid City, SD | Black Hills Creation Conference | (R. Guliuzza)
214.615.8325 | InstituteForBiblicalAuthority.org

For information on event opportunities, call **800.337.0375** or email Events@ICR.org

Subduction Was Essential for the Ice Age

Creation meteorologist Michael Oard has written extensively about what it takes to make an ice age. The first requirement is much warmer oceans than we have today, which would provide the extra evaporation needed for heavy winter snowfall. The second requirement is cooler summers that allow snow to build up from year to year and eventually transform into thick ice sheets.¹

But what would warm the oceans? And what could cause cooler summers for many years in a row? Catastrophic plate tectonics provides the answer for both warmer oceans and cooler summers. Such tectonic activity was apparently the mechanism God used to implement the global Flood.^{2,3} During the Flood, plates rapidly subducted into Earth's mantle and formed hot new seafloor at the ocean ridges. The result was a peak in ocean heating and volcanism at the same time.

If an explosive volcanic eruption is large enough, it can cool Earth by blocking out sunlight. For example, the 1815 eruption of Mount Tambora in Indonesia caused the “year without a summer” across Europe in 1816. Michael Oard refers to this temporary cooling of Earth as the “anti-greenhouse” effect.⁴ However, that particular cooling resulted from a single large explosive eruption. An ice age needs sustained eruptions of that kind over many decades or even centuries.

Not just any volcanism would accomplish this. Volcanoes are not all the same. The most common types of volcanoes across most of the ocean basins have basalt-rich magmas and are less capable of producing the explosions necessary to generate sun-

article highlights

- The Ice Age required years of warmer oceans combined with cooler summers.
- Tectonic plate subduction during the Flood resulted in new ocean crust that warmed the oceans and stratovolcanoes that ejected aerosols into the atmosphere to cool the earth.
- Only stratovolcanoes that form above subduction zones can produce the aerosols needed to initiate and sustain the Ice Age.
- Secular science can't explain how the Ice Age started, but the unique conditions produced by the Genesis Flood provide the answer.

blocking ash and aerosols (tiny particles or droplets).⁵ That kind of explosion needs the specific, volatile, silica-rich magmas generated by partial melts at subduction zones. So, what could cause enough of this kind of volcanic activity to produce an ice age?

The answer is the rapid subduction involved in catastrophic plate tectonics. Stratovolcanoes form above subduction zones as ocean lithosphere is pulled down into Earth's mantle. The heat of the mantle causes a partial melting of the crust. The first minerals to melt are those with the lowest melting points, such as quartz, feldspar, and biotite—the main components of granite—resulting in a granitic (silica-enriched) magma.

Stratovolcano eruptions often emit large amounts of sulfur dioxide gas. Chemical reactions in the atmosphere form sulfu-

ric acid droplets, which can remain in the stratosphere for two to three years. Subduction also introduces a lot of water into the melt, increasing the volatility of the magma. Granitic melt then rises and erupts catastrophically, sending ash and aerosols high into the atmosphere. The explosive volcanoes that accompanied subduction during the Flood, as well as their continued eruptions through the early post-Flood period, provided the aerosols needed for many years of summer cooling.

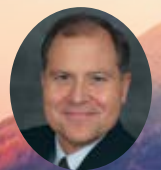
The two conditions that result in an ice age must be met simultaneously—centuries' worth of silica-rich volcanism to produce aerosols to cool Earth, and heating of the ocean to cause higher evaporation rates and the snowfall necessary to make the massive continental ice sheets. Together, these factors created the perfect conditions for the Ice Age. Then, as the ocean crust and the water above slowly cooled and volcanic activity diminished during the centuries after the Flood, the Ice Age ended.⁴

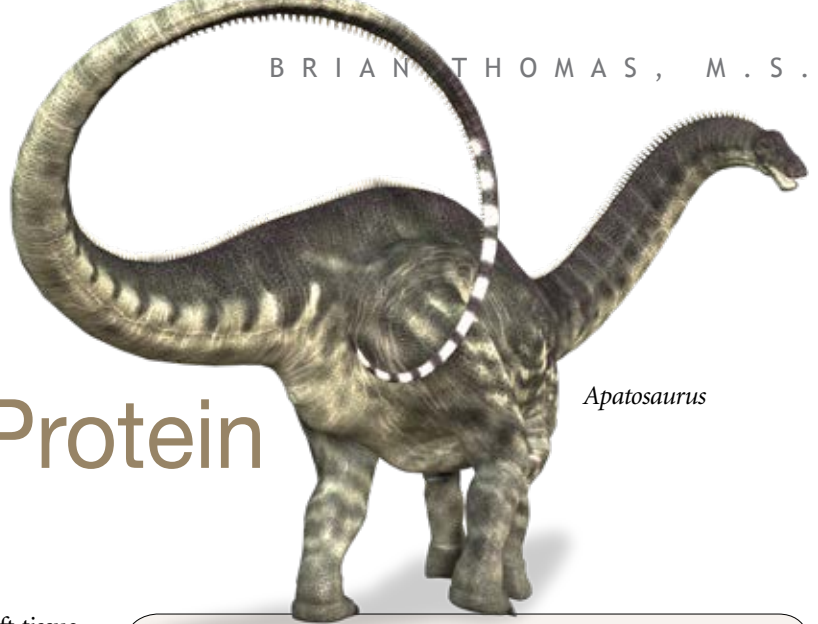
The subduction process and its results were no coincidence or accident. Secular science struggles to explain the Ice Age. But for those who affirm the historicity of God's Word, it's no mystery. The Flood described in Genesis provides the framework we need to decipher Earth's past. ✎

References

1. Oard, M. J. 1990. *An Ice Age Caused by the Genesis Flood*. El Cajon, CA: Institute for Creation Research.
2. Clarey, T. 2016. Embracing Catastrophic Plate Tectonics. *Acts & Facts* 45 (5): 8-11.
3. Hebert, J. 2017. The Flood, Catastrophic Plate Tectonics, and Earth History. *Acts & Facts* 46 (8): 11-13.
4. Oard, M. J. 2004. *Frozen in Time: The Woolly Mammoth, the Ice Age, and the Bible*. Green Forest, AR: Master Books.
5. Raymond, L. A. 1995. *Petrology: The Study of Igneous, Sedimentary, and Metamorphic Rocks*. Dubuque, IA: William C. Brown Communications.

Dr. Clarey is Research Associate at the Institute for Creation Research and earned his Ph.D. in geology from Western Michigan University.





Apatosaurus

Does the Toast Model Explain Fossil Protein Persistence?

About 10 years ago, I began tracking reports of soft tissue discoveries in fossils. By 2013, I had compiled a list of around 40 secular technical journal articles that describe either literal soft tissues or tissue remnants that include protein fragments and original biochemistry in very old fossils.¹ Real Science Radio host Bob Enyart and I continue to curate that growing list online.² In November 2018, it surpassed 101 journal articles. We think of this list as “101 reasons to reconsider deep time.” Each article reinforces a dilemma that a recent paper published in the online journal *Nature Communications* (*NComms*)³ claims to resolve—why are the tissues still there when artificial decay experiments show tissues can last thousands of years but not millions?

Yale News reporting on the *NComms* study compared the newly described preservation model to the color changes that happen when toast burns.⁴ So, we’ll call this new explanation the toast model. Do the authors’ published details support their claim that toasted proteins somehow resist microbes and molecules for millions of years? We offer two merits and five refutations of this claim. The refutations leave original tissue fossils just as mystifying to secular thinking as ever.

Track Record of Soft Tissue Fossil Rescuing Devices

The toast model study authors summarized the core issue: “The maximum longevity of original proteinaceous matter in vertebrate hard tissues has been estimated at 3.8 million years, although molecular remnants have been reported from older rocks.”³ The best protein decay estimates derive from artificial experiment decay curves that indicate best-case scenarios for protein survival.⁵ The *NComms* authors justified their 3.8 million-year (My) figure with studies that did not rely wholly on decay experiments.

Dr. Kevin Anderson of the Creation Research Society and I replicated similar decay studies. Our initial, unpublished results suggest that even 500,000 hypothetical years would stretch credulity for the decay of porcine bone collagen under an assumed historical temperature of 10°C (50°F). These studies do not include microbial degradation or radiation exposure, both of which damage large,

article highlights

- Dozens of fossils secularly dated as millions of years old contain original soft tissue remnants.
- Decay can be slowed but not stopped, and rates of decay demonstrate soft tissues can’t last that long.
- Researchers’ new “toast model” attempts to show that polymers can bind together and form a protective shield to preserve tissue, but it doesn’t explain nearly enough.
- Original soft tissue in fossils can’t be millions of years old. The scientific evidence fits the Bible’s timescale of just thousands of years.

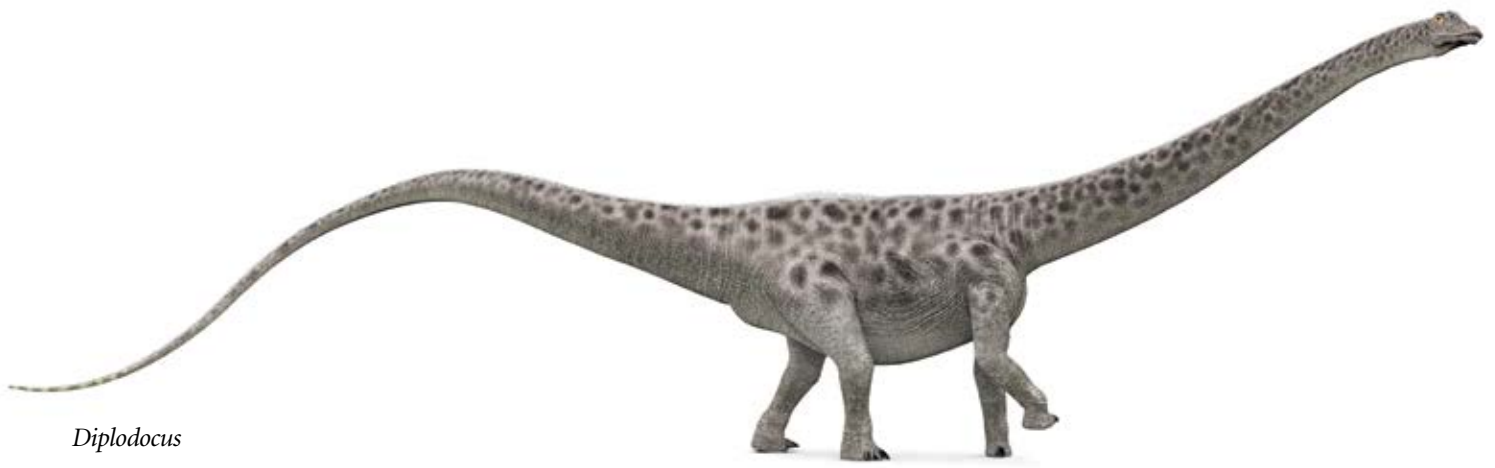
complicated molecules. In the end, any of these numbers challenge deep time. After all, original biochemicals occur in fossils that bear age assignments two orders of magnitude older than even 3.8 My. The fossil tissues’ shelf life cannot reasonably extend this far, let alone many times beyond it, so secularists look elsewhere for ways to shield their belief in deep time from the data that challenge it.

Uniformitarians have offered at least five scenarios in efforts to rescue fossil proteins from millions of years’ worth of chemical reactions that should have obliterated all original biochemistry. Table 1 outlines this history.

Rescuing Device	Promoted by	Refuted by
Modern bacterial contamination	Kaye et al, 2008 ⁶	Schweitzer et al, 2016 ⁷ ; Armitage and Anderson, 2013 ⁸
Biominerals adhesion	San Antonio et al, 2011 ⁹	Buckley et al, * 2008 ¹⁰
Clay mineral adsorption model	Edwards et al, 2011 ¹¹	Thomas, 2013 ¹
Iron preservation model	Schweitzer et al, 2014 ¹²	DeMasa and Boudreaux, 2015 ¹³ ; Anderson, 2016 ¹⁴
Modern residuals in instrument contamination	Buckley et al, 2017 ¹⁵	Wiemann et al, 2018 ³ ; Thomas 2017 ¹⁶
Toast model	Wiemann et al, 2018 ³	??

*Buckley et al indirectly refuted biominerals adhesion before its publication in 2011 by having already measured the bone collagen decay rate with biominerals adhesion included.

Table 1. Devices that were proposed to rescue original biochemicals in fossils from millions of years of decay.



Diplodocus

Peer-reviewed articles from either secular or creation science have refuted all five main attempts to explain soft tissue or original biochemistry in dinosaur and other fossils. Will the toast model be the first to escape incineration from the heat of scientific scrutiny? Below, I suggest five reasons why the toast model will prove to be the sixth failed rescuing device for original biochemistry in fossils.

What Is the Toast Model?

The *NComms* team noted dark coloration in or near soft tissues they found in their selected dinosaur bones and other fossils, as shown in Figure 1. Toasting bits of modern bone and shell on a hot plate for no more than 60 minutes darkened those proteins, too. The researchers found similarities in Raman spectra between toasted modern samples versus bone, shell, and tooth or scale tissues from fossils. Raman spectroscopy detects chemical bonds that help identify the chemistry of a sample.

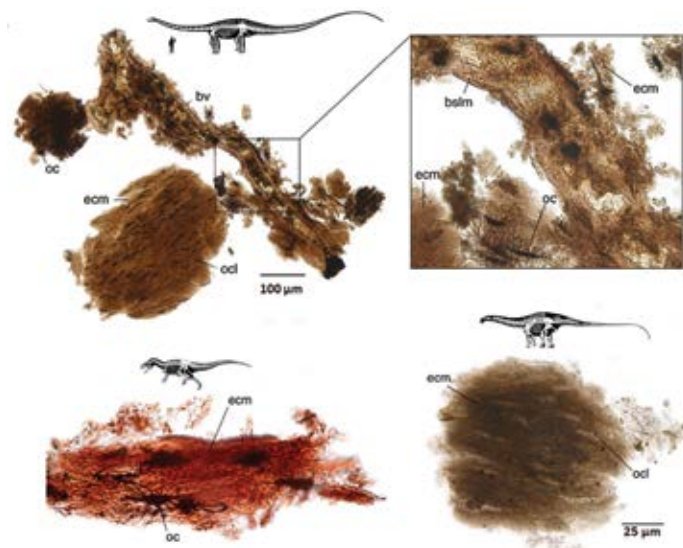


Figure 1. Partly polymerized soft tissues from demineralized *Diplodocus*, *Allosaurus*, and *Apatosaurus* bone. Images show remnants of osteocytes (oc), osteocyte lacunae (ocl), a blood vessel (bv), extracellular matrix (ecm), and basal lamina (bslm).

Image credit: Adapted from Wiemann et al., *Nature Communications*. Used in accordance with federal copyright (fair use doctrine) law. Usage by ICR does not imply endorsement of copyright holders.

The *NComms* study authors noted that proteins crosslink in both real fossils and artificial fossils (the toasted hard-tissue samples). They then asserted that fossilization “toasts” biochemicals into resistant compounds. Crosslinking refers to reactions that form covalent bonds between peptides and/or lipids. It happens daily inside cells to make a class of chemicals called *N-heterocyclic polymers*. The polymers have various sizes and configurations. They include Advanced Glycoxidation Endproducts (AGEs) and Advanced Lipoxidation Endproducts (ALEs). Healthy cells can take out this trash. After cell death, these polymers can accumulate—especially if heated. *N-heterocyclic polymers* are relatively large molecules that may last longer than the more fragile proteins from which they arose.

The *NComms* authors summarized the toast model thus:

The generation of brown-stained proteinaceous material, and subsequently non-proteinaceous AGEs and ALEs, provides an explanation for the apparent anomaly of widespread morphological and molecular preservation of soft tissues in fossil vertebrate hard tissues. Both AGEs and ALEs exhibit hydrophobic behavior due to the chemical character of their crosslinks, which in turn shield adjacent peptides from hydrolysis. Thermo-oxidatively induced, intensive crosslinking of proteins results in hydrophobic, reinforced AGE/ALE scaffolds resistant to microbial digestion. This explains the preservation of fragile soft tissues in certain chemical environments through deep time.³

They assume that *N-heterocyclic polymers* last millions of years. They further assert that the polymers shield nearby proteins for millions of years, too. No doubt, some uniformitarians will latch onto this idea as *the* explanation for what was once an anomaly but is now merely an “apparent anomaly.” Do data securely support this position?

Two Commendations for the Toast Model of Molecular Preservation

Do proteins really break down into amino acids or peptides that crosslink to form *N-heterocyclic polymers*? Yes, and this process probably receives too little attention from the literature that describes original biochemistry in fossils. Readers might think of biochemicals as decaying “downhill” from large proteins to tiny chemicals. We should instead acknowledge that at least some of the original proteins can go “uphill” when they crosslink to become more resistant polymers.¹⁷

Another merit of the toast model is that it recognizes and explains why certain fossils' soft tissues look darker than others. Oxidation during fossilization (probably very early in the process) can turn proteins into non-proteins. Similarly, it explains the change in Raman spectra between fossil and modern bone. A few years ago, I obtained Raman spectra from ancient bones (both thin-sectioned and powderized) of a range of ages (data unpublished). I noticed spectral differences between modern and ancient dinosaur bone that the toast model helps explain. Despite these commendations, problems arise with the idea that polymers can shield proteins for millions of years.

Five Refutations of the Toast Model

1. What about the light, not dark, soft tissue fossils?

In 2016, researchers described glycine, alanine, proline, leucine, lysine, hydroxyproline, and hydroxylysine in blood vessels from inside Mesozoic bones from Poland. They used other methods to detect histidine, asparagine, and either cysteine or cystine.¹⁸ More time equals more opportunity for crosslinking, toasting, and darkening. After 247 million years, why haven't all these residues oxidized into darkened decay products, including N-heterocyclic polymers, and why haven't those decay products themselves turned to dust? How does the toast model explain the obviously white *T. rex* connective tissues published in 2005 in *Science*¹⁹ or the transparent *T. rex* bone cells and *Triceratops* blood vessels published in 2007 in *Proceedings of the Royal Society B* (Figure 2)?²⁰ It explains nothing about these totally untoasted soft dinosaur tissues.

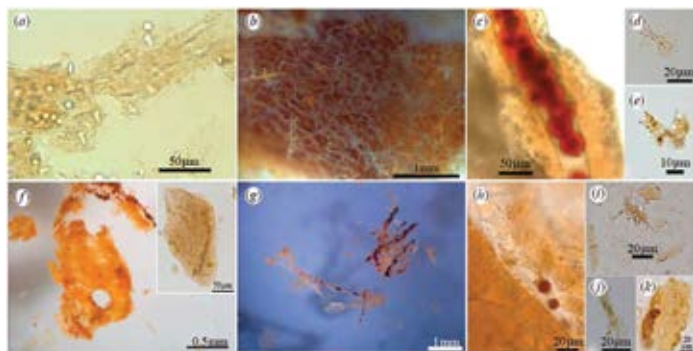


Figure 2. In the image above, (b) shows an interconnecting network of transparent vessels taken from a *T. rex* bone sample, while (g) shows transparent *Triceratops* blood vessels.

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2. Microbes versus molecules

For the sake of argument, let's assume polymer shields protect nearby proteins from "microbial digestion" for millions of years. Even so, no objective evidence supports the contention that such imagined shields could also protect nearby proteins from hydrolysis, a chemical breakdown due to reactions with water molecules. Chemistry happens relentlessly. Even a polymer shield strong enough to resist

microbes would soon develop cracks. It cannot block chemicals like oxygen, which also readily reacts with fragile molecules even underground. Indeed, tougher man-made polymers begin to break down within one human lifetime, so why should anyone believe that relatively flimsy AGEs can last even one million years? Microbes are only part of the problem. One can imagine ways to keep germs at bay for a while, although even they consume polymers,²¹ but how can oxygen be kept away? Geochemistry knows no way.

3. A contradictory result

The *NComms* study included a figure that summarized Raman spectral changes and color darkening alongside illustrations of increasing degrees of crosslinking in ancient and artificially aged samples. Their Figure 2c shows a strange result: A 3,000-year-old Egyptian *Psammornis* (an extinct ostrich-like bird) eggshell showed more crosslinking than a supposedly 66 million-year-old *Heyuannia* (oviraptor) eggshell from China. The study authors wrote a confusing non-explanation for this result:

Oxidative crosslinks are already present in *Psammornis rothschildi* (3 ky, Fig. 2), and were prominent after experimental maturation at 60°C for 10 min, suggesting that oxidative crosslinking is an early diagenetic process, dependent on chemical conditions in the depositional environment as well as later diagenetic processes, rather than increased temperatures due to burial.³

So, should we attribute the crosslinking to increased temperature, chemical conditions, early diagenetic processes, late diagenetic processes, or what? If the toast model works, then older samples should look *darker* than younger ones—the opposite of this result.

4. Missing: a longevity experiment

It's one thing to make a claim but another to defend it. Color and Raman spectral changes indicate chemical changes in fossil bone proteins. Proteins can crosslink to become resistant polymers. However, what data support the story that these polymers "shield adjacent peptides... through deep time,"²³ or even that microbes don't consume them? The researchers reason that molecular shields preserve nearby proteins for millions of years because the protein-bearing fossils are millions of years old. That's circular reasoning, not good science.

Can experiments test the longevity of these toasted-protein polymer shields rather than having to resort to assuming the conclusion? Yes, but the *NComms* paper shows no such experiment. It offers data for crosslinking but not for molecular shielding—and certainly not for molecular shielding that could last millions of years.

The toast model calls for oxidation to crosslink peptides into polymers. However, oxidation breaks down biomolecules, including peptides, more often than it might build them into larger structures.¹⁴ A proper decay experiment would undoubtedly confirm the oxidative decay of polymers.²² Then the polymer shield would be toast.

5. Too little brittle

Last, the toast model does not explain flexible tissue. It has most of the original proteins crosslinking into a crusty shrink-wrap around protein remnants. How does that explain wholly soft, pliable tissue? For example, North Carolina State University paleontologist Dr. Mary Schweitzer recorded a video of *T. rex* connective tissue being pulled and stretched and flexing back into shape.²³ Similarly, Figure 3 shows a still image from the DVD *Echoes of the Jurassic*.²⁴ In it, a worker's forceps pull pliable connective tissue from inside an untreated *Thescelosaurus* vertebra from Cretaceous system sediments.



Figure 3. *Thescelosaurus* (GDFM07.003, Glendive Dinosaur and Fossil Museum) vertebral flexible connective tissue remnants show almost no sign of hardening due to oxidative crosslinking.

Image credit: Kevin Anderson, Creation Research Society

Mark Armitage and Kevin Anderson published their description of a pliable sheet of soft tissue extracted from a *Triceratops* horn core excavated from near the surface of the ground.⁹ And yet, secular dating asserts an age for the horn sediments at about 70 My.

Not to be outdone, Precambrian seafloor worm sheath fossils with an evolutionary age of 551 million years were entirely flexible, with no toasting. Publishing in the *Journal of Paleontology*, the study authors wrote, “Minerals have not replicated any part of the soft tissue and the carbonaceous material of the wall is primary [not replaced], preserving the original layering of the wall, its texture, and fabrics.” They described the worm sheath as still “flexible, as shown by its soft deformation.”²⁵

Conclusion

Does the toast model explain how soft tissue can last millions of years? AGEs and the like may help shield *some* nearby protein remnants from the ravages of radiation, microbes, and relentless destructive chemistry for thousands of years. But it explains none of the features of entirely flexible, not-toasted tissue structures found in other fossils.

The way to show that AGEs last for millions of years is to perform a longevity experiment. Nobody has done that. As a result, the only way to conclude that the toast model explains protein persistence for millions of years is to first assume that fossils with proteins still in them have been sitting in the ground for millions of years, thus begging the question. For these reasons, we predict that the toast model will help explain certain fossil features but that other soft tissue discoveries will continue to fail to fit the toast model's mold.

The most practical explanation for all fossil protein persistence still lies in contracting the evolutionary timescale down to a biblical timescale. Noah's recent Flood explains the persistence of organics, including whole tissues, in fossils simply by erasing the uniformitarian requirement of deep time. With the mere several thousand years of biblical history and the Noachic Flood to explain the existence of so many fossils in the first place, original proteins in fossils fall into place. ☒

References

1. Thomas, B. 2013. A Review of Original Tissue Fossils and Their Age Implications. In *Proceedings of the Seventh International Conference on Creationism*. M. Horstmeier, ed. Pittsburgh, PA: Creation Science Fellowship.
2. List of Biomaterial Fossil Papers (maintained). Online document, accessed November 20, 2018.
3. Wiemann, J. et al. 2018. Fossilization transforms vertebrate hard tissue proteins into N-heterocyclic polymers. *Nature Communications*. 9: 4741.
4. Shelton, J. A toast to the proteins in dinosaur bones. Yale News. Posted on news.yale.edu November 9, 2018, accessed November 14, 2018.
5. Buckley, M. and M. J. Collins. 2011. Collagen survival and its use for species identification in Holocene-lower Pleistocene bone fragments from British archaeological and paleontological sites. *Antiqua*. 1 (1): e1.
6. Kaye, T. G., G. Gaugler, and Z. Sawlowicz. 2008. Dinosaurian Soft Tissues Interpreted as Bacterial Biofilms. *PLoS ONE*. 3 (7): e2808.
7. Schweitzer, M. H., A. E. Moyer, and W. Zheng. 2016. Testing the Hypothesis of Biofilm as a Source for Soft Tissue and Cell-Like Structures Preserved in Dinosaur Bone. *PLoS ONE*. 11 (2): e0150238.
8. Armitage, M. H. and K. L. Anderson. 2013. Soft sheets of fibrillar bone from a fossil of the supraorbital horn of the dinosaur *Triceratops horridus*. *Acta Histochemica*. 115 (6): 603-608.
9. San Antonio, J. D. et al. 2011. Dinosaur Peptides Suggest Mechanisms of Protein Survival. *PLoS ONE*. 6 (6): e20381.
10. Buckley, M. et al. 2008. Comment on “Protein Sequences from Mastodon and *Tyrannosaurus rex* Revealed by Mass Spectrometry.” *Science*. 319 (5859): 33c.
11. Edwards, N. P. et al. 2011. Infrared mapping resolves soft tissue preservation in 50 million year-old reptile skin. *Proceedings of the Royal Society B*. 278 (1722): 3209-3218.
12. Schweitzer, M. H. et al. 2014. A role for iron and oxygen chemistry in preserving soft tissues, cells and molecules from deep time. *Proceedings of the Royal Society B*. 281 (1775): 20132741.
13. DeMasa, J. M. and E. Boudreaux. 2015. Dinosaur Peptide Preservation and Degradation. *Creation Research Society Quarterly*. 51 (4): 268-285.
14. Anderson, K. 2016 Dinosaur Tissue: A Biochemical Challenge to the Evolutionary Timescale. *Answers in Depth*. Posted on answersingenesis.org October 20, 2016, accessed November 21, 2018.
15. Buckley, M. et al. 2017. A fossil protein chimera; difficulties in discriminating dinosaur peptide sequences from modern cross-contamination. *Proceedings of the Royal Society B*. 284 (1855): 21470544.
16. Thomas, B. Ancient Animal Biochemicals Again. *Creation Science Update*. Posted on ICR.org December 7, 2017, accessed November 10, 2018.
17. They go “uphill” with respect to longevity while going “downhill” with respect to organization.
18. Surmik, D. et al. 2016. Spectroscopic Studies on Organic Matter from Triassic Reptile Bones, Upper Silesia, Poland. *PLoS ONE*. 11 (3): e0151143.
19. Schweitzer, M. H. et al. 2005. Soft-tissue vessels and cellular preservation in *Tyrannosaurus rex*. *Science*. 307 (5717): 1952-1955.
20. Schweitzer, M. H., J. L. Wittmeyer, and J. R. Horner. 2007. Soft tissue and cellular preservation in vertebrate skeletal elements from the Cretaceous to the present. *Proceedings of the Royal Society B*. 274 (1604): 183-197.
21. Kijchavengkul, T. and R. Auras. 2008. Compostability of polymers. *Polymer International*. 57 (6): 793-804.
22. van Dijkhuizen-Radersma, R. et al. 2014. Chapter 7.4 in *Tissue Engineering*. C. Van Blitterswijk and J. de Boer, eds. Boston: Elsevier, 193-221.
23. B-Rex. *60 Minutes*. Aired on CBS November 15, 2009. Posted on youtube.com December 26, 2010.
24. Bendewald, J. 2017. *Echoes of the Jurassic: Discoveries of Dinosaur Soft Tissue* DVD. Creation Research Society.
25. Moczydlowska, M., F. Westall, and F. Foucher. 2014. Microstructure and Biogeochemistry of the Organically Preserved Ediacaran Metazoan *Sa-bellidites*. *Journal of Paleontology*. 88 (2): 224-239.

Mr. Thomas is Science Writer at the Institute for Creation Research and earned his M.S. in biotechnology from Stephen F. Austin State University.



Are Creationists Biased?



Creation critics object that creation scientists are biased. Since we seek answers to skeptical objections to the biblical account of creation, this supposedly means our research results are automatically suspect. This argument might seem reasonable at first glance. After all, shouldn't researchers be completely open-minded and approach their work without any preconceived ideas? Even some intelligent design proponents take pains to claim that unlike "religiously motivated" creationists, *their* research is purely objective and free of any prior commitments to a particular belief system.

We creationists freely admit that we are firmly convinced the Bible is the inerrant Word of God. And we affirm the book of Genesis provides a literal historical account of origins and Earth history. This conviction motivates the research we do. However, the automatic dismissal of creation research because of "bias" is both unfair and hypocritical.

Our bias is certainly *not* a license for or an indication of scientific dishonesty. In fact, we have an even stronger motivation for scientific integrity than do secular scientists. God will judge us if we exaggerate or distort the scientific evidence (Romans 14:12; 1 Corinthians 4:2-5).

The problem is not bias *per se* but *unreasonable* bias. Which is more reasonable, a pro-creation or a pro-evolution predisposition? Even evolutionists admit that living things *look* designed.¹ Despite decades of intense research, they still have no clue how

life began.² Where is the fossil evidence for evolution? Even evolutionists don't agree on the handful of supposed transitional forms usually trotted out as evidence for evolution.³ In fact, the very existence of those fossils in water-deposited rocks is *exactly* what one would expect from the Genesis Flood. So, is it creation researchers who are being unreasonable or is it evolutionists?

Furthermore, some bias is essential to science. Significant scientific results are almost never intuitively obvious. They require hard work and perseverance. And scientists will never bother to do that kind of hard work unless they already suspect that a particular line of research might be successful. But this suspicion of a potential discovery is itself a form of bias.

Creation scientists have already convincingly answered many of the toughest objections of biblical skeptics. For instance, creation researcher Dr. John Baumgardner has done world-class research in sophisticated computer modeling of the Genesis Flood.⁴ Obtaining those scientific answers

required decades of hard work and study. The only people who would even attempt such intense research are scientists already biased in favor of biblical creation.

Hence, it is simply unfair to dismiss creation research based on an accusation of bias. This is part of the self-serving "heads I win tails you lose" rules of engagement that secular scientists and other skeptics tend to impose on creation researchers. On the one hand, if we don't yet have an answer to a skeptic's particular objection,

this is seen as evidence that the creation position can't possibly be taken seriously. On the other hand, if we *do* find the answer to that question, the very fact that we searched for an answer is seen as evidence of a disqualifying bias.

Everyone has biases, including evolutionists. Rather than dismissing creationists' research because of our admitted bias, secular scientists and biblical critics need to take a long hard look at their own biases. As creationists have long pointed out, the issue isn't whether there's bias but which bias works best at explaining the evidence. ✍

References

1. Dawkins, R. 1986. *The Blind Watchmaker*. New York: W. W. Norton & Co. Cited in Catchpole, D. 2009. Dawkins and Design. *Creation*. 31 (3): 6.
2. Horgan, J. Pssst! Don't tell the creationists, but scientists don't have a clue how life began. *Scientific American Cross-Check*. Posted on blogs.scientificamerica.com February 28, 2011, accessed December 20, 2018.
3. Thomas, B. 150 Years Later, Fossils Still Don't Help Darwin. *Creation Science Update*. Posted on ICR.org March 2, 2009, accessed January 4, 2019.
4. Baumgardner, J. 2016. Numerical Modeling of the Large-Scale Erosion, Sediment Transport, and Deposition Processes of the Genesis Flood. *Answers Research Journal*. 9: 1-24.

Dr. Hebert is Research Associate at the Institute for Creation Research and earned his Ph.D. in physics from the University of Texas at Dallas.



article highlights

- Creation scientists are seen as biased because they believe the Bible's creation narrative.
- Evolutionists are also biased in their approach to science.
- Some bias is essential for science. Researchers usually follow a line of thought they believe has the most merit.
- The key question is not whether there's bias but which bias works best at explaining the evidence.

Work continues in almost every corner of the ICR Discovery Center for Science and Earth History. Every time we don hard hats and safety glasses in a search for photo ops, we're not disappointed.

The baobab tree still needs foliage and bark. Baobab trees are believed to live up to 3,000 years, and ours will soon come to life. This exhibit illustrates the diversity of habitats after the Flood.

One of the huge exterior wall panels depicts an ichthyosaur, a large extinct marine reptile that could grow longer than 60 feet. This ichthyosaur has quite a tale to tell. It's based on a real fossil of a creature that was in the midst of giving birth when it was buried during Noah's Flood. The birth is frozen in time and documents the Flood's

sudden catastrophic nature, overtaking even the most powerful swimming creatures.

The Ice Age theater is getting a... um...fresh coat of ice! A team of sculptors is "icing" the theater inside and out. The theater will feature a movie describing how the Flood's aftermath provided just the right conditions for the Ice Age to occur.

Noah's Ark is being assembled from big timbers and awaits the arrival of the animals, and artisans have been hard at work on the Grand Canyon exhibit—the colors really bring the beautifully sculpted rock faces to life. This model's base is literally below ground to showcase the canyon's depth and grandeur.

All this and more will demonstrate the evidence that upholds the accuracy

of the Bible and the truth of our Creator. We're looking forward to when we can open the doors and you can experience this for yourself!

Help Us Complete the Exhibits

We're developing the most educational and inspirational exhibits possible to point people to the truth of our Creator, the Lord Jesus Christ. Visit ICR.org/Discovery-Center to find out how you can partner with us in prayer and help us finish strong!



The baobab tree awaits its leaves



The mighty ichthyosaur



Ark timbers



Grand Canyon colors



The Ice Age theater gets frosted



Creatures' Anticipatory Systems Forecast and Track Changes

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

article highlights

- Creatures use internal predictive models of their environments called *anticipatory systems* to self-adjust to likely future conditions.
- Biological anticipatory systems refute evolutionary theory, which holds that adaptation must be “blind” with respect to an organism’s future needs.
- An engineering-based design theory like ICR’s continuous environmental tracking model can make useful predictions and guide scientific research into anticipatory systems.
- An omniscient Creator could provide His creatures with the anticipatory systems they need to adapt.

On January 1, 2019, the American spacecraft *New Horizons* gathered close-up images of a rocky object over four billion miles from Earth. *New Horizons* launched in 2006 and was guided over three billion miles to rendezvous with Pluto (less than 1,500 miles in diameter) in 2015. Then it surpassed that accomplishment by traveling another billion miles to intercept a mere 21-mile-long, snowman-shaped rock as 2019 dawned.

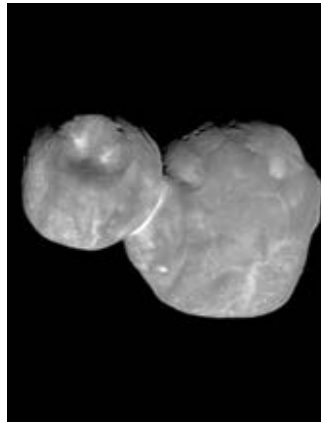


Image credit: NASA/JHUAPL/SwRI

The engineering prowess it took to achieve this is staggering. Engineers used mathematical models to anticipate the future locations of all three objects. A high-tech tracking system monitored *New Horizons* as engineers on Earth made extremely fine course corrections. The same engineering principles that govern these advanced human-engineered systems likely underlie the sophisticated *anticipatory systems* inside of creatures so they can both predict and then prepare for future environmental conditions—but through fully self-contained mechanisms.

Biological Anticipatory Adaptive Systems

Previously in this article series, we’ve considered how organisms use innate logic mechanisms to rapidly produce solutions to

environmental challenges that are so targeted they can be predicted.¹ This observation deals a serious blow to the central anti-design tenet of evolutionary theory, which holds that evolutionary change *must* be random with respect to an organism’s future needs.

Now we’ll see how many adaptations are not just reactive in real time but rather flow from logic-based systems that give creatures foresight—both conscious and unconscious—of how they ought to preemptively self-adjust to predicted external conditions. Given that biological anticipatory adaptive systems are both predictive in nature and extend the design features of reactive systems to new heights, their impact is substantial support *for* ICR’s design-based continuous environmental tracking (CET) model and *against* chance-based evolution.

A distinctive tenet of the CET model is that it predicts a tight correlation between the elements in human-designed systems with those in biological systems that perform similar functions. Therefore, if humans develop complicated models to forecast the weather or celestial motions, and if creatures are expected to continuously track changing conditions, then a design-based theory should predict that organisms would also have innate anticipatory systems.

We’ll consider the basic elements of these fascinating systems and how they fit into the CET model. But first, we need to simply observe organisms. Are there any indicators of an internal capability to forecast impending challenges and then—in clear anticipation—tailor their expression of suitable traits and behaviors? Yes!

Creatures Demonstrate Anticipatory Actions in Abundance

Tomato Plants

A report in 2018 described a study showing how tomato plants can detect snail mucus that is merely in close proximity rather than in direct contact. It stated:

New research now shows some flora can detect an herbivorous animal well before it launches an assault, letting a plant mount a preemptive defense that even works against other pest species.... “None of the plants were ever actually attacked,” [lead investigator John] Orrock says. “We just gave them cues that suggested an attack was coming, and that was enough to trigger big changes in their chemistry.”²



Orrock's paper in *Oecologia* points to innate anticipatory logic coordinating "a defensive response in plants that have not been attacked... Plants integrate the many sources of information regarding attack in their environment to optimize investment in defense... [so] that plants prioritize risk information... whereby information that is likely linked with greater imminent risk triggers a stronger defense."³

Honeybees

Insects also exhibit anticipatory behavior. A technical article on honeybee research noted:



Most organisms are constantly faced with environmental changes and stressors. In diverse organisms, there is an anticipatory mechanism during development that can program adult phenotypes. The adult phenotype would be adapted to the predicted environment that occurred during organism maturation.⁴

Developing honeybees responded in this manner when they were exposed to nutritional deprivation. An Arizona State University news release reported:

"Surprisingly, we found that short-term starvation in the larval stage makes adult honeybees more adaptive to adult starvation. This suggests that they have an anticipatory mechanism like solitary organisms do," said [lead study author] Ying Wang.... The anticipatory mechanism [is] also called "predictive adaptive response."⁵

Wang's technical article notes that anticipatory self-adjustments are not trivial, but "that adaptive phenotypic changes are induced at the physiological, molecular and behavioral levels."⁴

Cross-Generational: Sea Urchins

In one four-month experiment, a group of sea urchins was kept at average ocean temperatures and pH while another group was kept at colder temperatures and low pH conditions.



During that time, females in both groups reproduced. Embryos then developed in either high or low pH levels. Researchers examined every gene activated during early development to see if traits suitable to the anticipated conditions were expressed. Principle investigator Gretchen Hofmann said of the study's results:

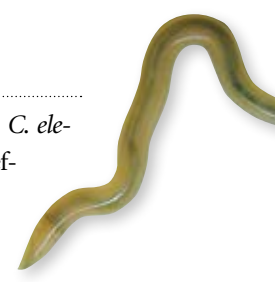
It was more dramatic than we expected... It's almost like the female could sense that her progeny were about to be released into some challenging conditions for early-stage development. In response, she primed her offspring and gave them tools to face stressful conditions. It's like she packed them a backpack of tools.⁶

Hofmann's scientific report infers "that transgenerational plas-

ticity in situ could act as an important mechanism by which populations might keep pace with [i.e., track] rapid environmental change."⁷ This anticipatory mechanism certainly functions in line with the purpose expected by the CET model.

Cross-Generational: Round Worms

A Duke University study on the tiny worm *C. elegans* uncovered "a genetic network that mediates effects of a mother's diet on the size and starvation resistance of her offspring," a network that functions "to transmit information about her diet to her offspring."⁸ Study leader L. Ryan Baugh said, "These animals are able to anticipate adverse conditions based on their mothers' experience" and believes that "mom somehow provisions the embryo, or programs it."⁹ The technical report surmised that "such effects of diet across generations is likely relevant to human diseases related to nutrient sensing and storage."⁸



Another recent paper documented multiple examples where "changes in the parental phenotype can act as a signal to offspring about the future environment that they will encounter and these parental cues can induce adaptive plasticity in offspring characteristics (adaptive transgenerational phenotypic plasticity or adaptive parental effects)." Therefore, anticipatory mechanisms appear to be widespread, as "maternal stress can play adaptive roles across a wide variety of animal taxa if stress-induced phenotypes better prepare offspring for a stressful postnatal environment."¹⁰

Cross-Generational: Humans

The relevance of anticipatory systems to human diseases is real. This may occur when the predicted conditions that offspring prepare for in development don't match the conditions they face in adulthood. A recent study compared the health status of residents in a Chinese city who had prenatal exposure to the severe 1958–1962 famine (about 35 million lives were lost) to those who were not exposed.¹¹ A protective anticipatory trait in children born to starving parents was the tendency to "horde" extra nutritional calories by storing them as fat. However, after the famine they grew up in a more abundant caloric environment. Unfortunately, prenatal exposure to famine was associated with increased risk of weight gain, type 2 diabetes, and hyperglycemia as adults. The odds of developing hyperglycemia were about 2:1 in both children and grandchildren. The probability of type 2 diabetes in the children of starved parents was about 75% higher. The risk of developing disease was higher if both parents were starved.



Design-Based Models Can Predict Key Elements in Biological Anticipatory Systems

The details of how biological anticipatory systems work are poorly understood. This is where a framework for biological design theory proves beneficial. If an engineering-based theoretical assumption is valid that there will be a tight correlation in system elements between poorly understood biological systems and well-understood man-made systems, then it should guide research by predicting what to look for.

Foremost—and in sharp contrast to all selectionist notions—we should expect that anticipatory capacity is fully internal to creatures. The formal definition of an anticipatory system provided by Robert Rosen and his student Aloisius Louie, pioneers in conceptualizing biological anticipatory systems, captures its internalistic nature:

An anticipatory system is a natural system that contains an internal predictive model of itself and of its environment, which allows it to change state at an instant in accord with the model's predictions pertaining to a later instant.¹²

All the examples above point to internal mechanisms. Additionally, recent research on behavioral flexibility conferred by “foresight” derived from anticipatory systems within arthropods said they “seem to use *internal models* of the surrounding world to tailor their actions adaptively to predict the imminent future,” but later the researchers candidly added, “We currently have *no information* about the circuitry that underpins the imagination of possible future states or problem solutions.”¹³

But human-engineered anticipatory models are well understood. From an engineering standpoint, such models could give clues to system elements that are likely to be discovered in biological anticipatory mechanisms. For example, models that forecast weather assimilate a minimum of:

1. Mathematical equations characterizing the physics of natural phenomena,
2. Data from diverse sensors of current conditions,
3. Stored data on weather trends, and
4. Additional equations to “[step] forward in time” the established “initial conditions.”¹⁴

The CET model would predict that biological anticipatory systems likely have key elements comparable to these four. The outputs of weather models serve as inputs for people to plan outdoor activities. Similarly, after biological foresight emerges from anticipatory mechanisms, it's an input for other systems that guide developmental or physiological and behavioral actions.

We know that biological systems can model natural phenomena. Through experiments on astronauts catching a ball on Earth and in zero gravity, scientists found evidence for internal modeling of gravitational effects on moving objects. They said:

We conclude, therefore, that when catching a falling ball, the ner-

vous system uses a second-order internal model [the ratio of the size of the object's retinal image (r) to its rate of change (dr/dt)] of gravity to estimate TTC [Time To Catch].¹⁵

The location(s) where and exactly how this logic is modeled is unclear.

Given essential performance parameters, the engineering-based CET model would predict that an interface exists within organisms to facilitate rapid switches between anticipatory and purely reactive mechanisms to enhance adaptive responses. In addition, there should be a mechanism akin to human-engineered artificial intelligence to self-modify the entire anticipatory mechanism. This would enable it to “learn” from prior experience, refine responses, and not necessarily produce cookie-cutter actions even if exposed in the future to the same conditions.

Conclusion

Biological anticipatory systems are real, and creatures use them to closely track environmental changes. Not only do they fit perfectly within the CET model, an engineering-based theory of design shows its scientific value by making useful predictions to guide scientific research into these poorly understood mechanisms.

What can we say about systems that enable creatures to act preemptively, provision for the future, prime their young, or allow a mother to “pack” her offspring with “a backpack of tools”? For those with eyes to see, they burst with such purpose-driven activity that both the genius and tender provision of their Creator, the Lord Jesus Christ, are clearly seen. ✎

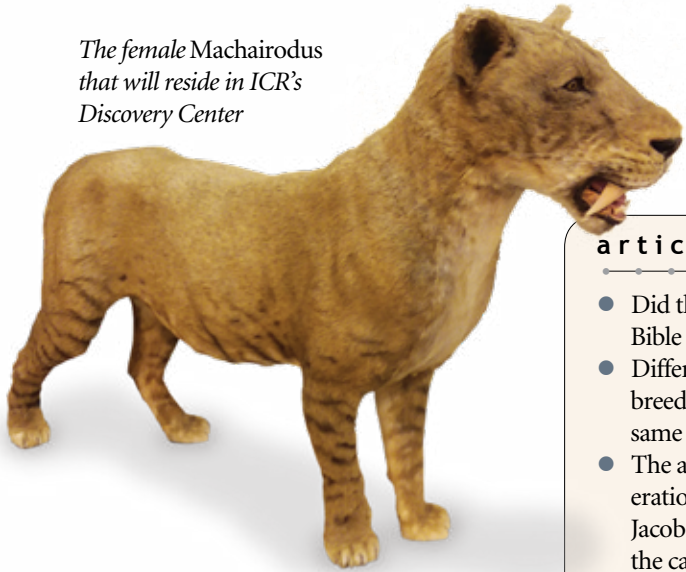
References

1. Guliuzza, R. J. 2018. Engineered Adaptability: Adaptive Changes Are Purposeful, Not Random. *Acts & Facts*. 47 (6): 17-19.
2. Tennenhouse, E. 2018. Watchful Plants. *Scientific American*. 318 (5): 16-17.
3. Orrock, J. L. et al. 2018. Plants eavesdrop on cues produced by snails and induce costly defenses that affect insect herbivores. *Oecologia*. 186 (3): 703-710.
4. Wang, Y. et al. 2016. Starvation stress during larval development facilitates an adaptive response in adult worker honey bees (*Apis mellifera* L.). *Journal of Experimental Biology*. 219: 949-959.
5. Starvation as babies makes bees stronger as adults. Arizona State University news release. Posted on campus.asu.edu March 30, 2016, accessed January 1, 2019.
6. Cohen, J. Rapid Adaptation: Biologists discover that female purple sea urchins prime their progeny to succeed in the face of stress. University of California Santa Barbara news release. Posted on news.ucsb.edu March 26, 2018 accessed June 20, 2018.
7. Wong, J. M. et al. 2018. Transcriptomics reveal transgenerational effects in purple sea urchin embryos: Adult acclimation to upwelling conditions alters the response of their progeny to differential pCO₂ levels. *Molecular Ecology*. 27 (5): 1120-1137.
8. Hibshman, J. D., A. Hung, and L. R. Baugh. 2016. Maternal Diet and Insulin-Like Signaling Control Intergenerational Plasticity of Progeny Size and Starvation Resistance. *PLOS Genetics*. 12 (10): e1006396.
9. Smith, R. A. Underfed Worms Program Their Babies to Cope With Famine. Duke Today. Posted on today.duke.edu October 27, 2016, accessed December 16, 2016.
10. Sheriff, M. J. et al. 2018. Error management theory and the adaptive significance of transgenerational maternal-stress effects on offspring phenotype. *Ecology and Evolution*. 8 (13): 6473-6482.
11. Li, J. et al. 2017. Prenatal exposure to famine and the development of hyperglycemia and type 2 diabetes in adulthood across consecutive generations: a population-based cohort study of families in Suihua, China. *The American Journal of Clinical Nutrition*. 105 (1): 221-227.
12. Louie, A. H. 2010. Robert Rosen's anticipatory systems. *Foresight*. 12 (3): 18-29. Emphasis in original.
13. Perry, C. J. and L. Chittka. 2019. How foresight might support the behavioral flexibility of arthropods. *Current Opinion in Neurobiology*. 54: 171-177. Emphasis added.
14. Durbin, S. What are weather models, exactly, and how do they work? *The Washington Post*. Posted on washingtonpost.com May 18, 2018, accessed January 2, 2019.
15. McIntyre, J. et al. 2001. Does the brain model Newton's laws? *Nature Neuroscience*. 4 (7): 693-694.

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.



The female *Machairodus* that will reside in ICR's Discovery Center



Q: Have Lions Always Been Lions?

article highlights

- Did the lions mentioned in the Bible look like modern lions?
- Different cat varieties can interbreed because they are all of the same cat kind.
- The approximately 165 cat generations between the Flood and Jacob allowed plenty of time for the cat kind to diversify into a wide variety of species.
- Lions have always been lions.

“Can you hunt the prey for the lion, or satisfy the appetite of the young lions, when they crouch in their dens, or lurk in their lairs to lie in wait?” (Job 38:39-40)

A When God spoke to Job and his friends, He referred to animals they all knew. Did the animal He called a lion look the same as what we call a lion today? A historical sketch of lions helps show how such studies can confirm the Bible.

During the creation week, God created each animal to reproduce “according to its kind.” Much later, Noah’s family brought two of every kind onto the Ark.¹ Are lions their own kind, or are they part of a larger reproducing group?

Unexpected cat varieties can interbreed, especially in captivity. For example, a lion crossed with a tigress produces a liger. A tiger crossed with a lioness produces a tigon.² Ligers and tigers share genetic and physical features of both parents. Sometimes they have both tiger stripes and faint lion spots. The fact that lions and tigers are interfertile shows that they belong to a single animal kind. Do other cats also belong in the group?

Many different cats can interbreed.³ When added together, they form a string of

breeding varieties that includes all cats. This means that today’s lions, tigers, jaguars, leopards, and even house cats descended from just a few generic-looking cats.⁴ And those must have descended from the two cats on board Noah’s Ark.

Could cat varieties such as lions have established themselves in the time between the Flood and Jacob’s comparison of his son Judah to a lion?⁵ Jacob died in 1859 BC according to a biblical timeline.⁶ I estimate a date for Noah’s Flood at about 2518 BC.⁷ Subtracting, we find 659 years from the Flood until Jacob’s mention of lions. It takes about four years before a lion reaches the proper size to take over a pride and sire cubs. Smaller wildcats like the ocelot and lynx take about 2.5 years between generations, and caracals only one. Using the longer lion generation time gives $659/4 = 165$ cat generations between the Flood and Jacob. This is plenty of time for the cat kind to be fruitful, multiply into a range of cat varieties, and fill the rapidly changing post-Flood earth.

Long after Jacob, lions still lived in Israel during Samson’s lifetime, and one of King David’s top warriors won fame for killing a lion.⁸ Over 1,200 years after Jacob, Nebuchadnezzar, the Babylonian king who

destroyed Jerusalem in 587 BC, constructed his grand processional way at the entrance to Babylon. The Louvre in Paris holds one of its lion panels. Lions no longer inhabit the Middle East. Changing climates and run-ins with people reduced their numbers. Lions and their habitats continue to shrink today.



Lions once roamed the Middle East—so say both the Bible and archaeology. Cats had plenty of time to separate into lions, bobcats, *Smilodon*,⁹ and others by the time God spoke of lions to Job.¹⁰ Yet, they all remain cats to this day, just like Genesis said. The lions of Job’s day probably looked like today’s African lions. Studying these great cats helps us see the Bible’s reliability. ✎

References

1. Genesis 1:24; Genesis 7:8-9.
2. Thomas, B. Lions, Tigers, and Tignons. *Creation Science Update*. Posted on ICR.org September 12, 2012, accessed January 14, 2019.
3. Pendragon, B. and N. Winkler. 2011. The family of cats—delineation of the feline basic type. *Journal of Creation*. 25 (2): 118-123.
4. Driscoll, C. A. et al. 2007. The Near Eastern Origin of Cat Domestication. *Science*. 317 (5837): 519-523.
5. Genesis 49:9.
6. Steinmann, A. E. 2010. *From Abraham to Paul*. St. Louis, MO: Concordia Publishing House.
7. Thomas, B. 2017. Two Date Range Options for Noah’s Flood. *Journal of Creation*. 31 (1): 120-127.
8. Judges 14; 2 Samuel 23:20.
9. Likely these saber-toothed tigers took some generations to migrate from the Ark, cross the land bridge that rising sea levels later covered to form the Bering Strait, and spread into the Americas before they went extinct sometime in the post-Flood Ice Age.
10. If the Eliphaz named in Job was the same Eliphaz mentioned in Genesis 36, then Job may have lived during the early part of Israel’s sojourn in Egypt, the 18th century BC.

Mr. Thomas is Science Writer at the Institute for Creation Research and earned his M.S. in biotechnology from Stephen F. Austin State University.

Ecosystem Engineering Explanations Miss the Mark

The ancient Philistines were embarrassed when Dagon, their chief idol, fell on its face before the Ark of the Covenant, so they propped it back up again.¹ Maybe today’s evolutionary ecologists feel the same as they repeatedly try to fix the failings of their favorite evolution-based theories. Evolutionists assume the inanimate environment itself was the causal “origin of species.” But real-world ecological research continues to impeach the Darwinian assumption that animals are passively shaped and redefined by nonliving geophysical forces.

Ecosystem engineering, a new analytical concept, illustrates how secularists are “always learning and never able to come to the knowledge of the truth” (2 Timothy 3:7). How so? This analysis does represent an increase in learning about nature, but it simultaneously represents a failure to reach the true target—genuine knowledge.

The Darwinists’ own words betray them as they misapply the term “engineer” in their quest to comprehend nature apart from truths revealed in the Bible. Studying God’s creation with a closed Bible is like trying to assemble a 5,000-piece jigsaw puzzle without looking at the “answer” on the puzzle box cover!²

Before critiquing the conceptual defects of ecosystem engineering, let’s look at its limited usefulness for analyzing how different creatures change their habitats. Ecosystem engineering explanations were introduced in 1994 by Clive Jones and his colleagues in a seminal article titled “Organisms as Ecosystem Engineers.”³ In a later paper, he stated:

Ecologists have long recognized that organisms can have important impacts on physical and chemical processes occurring in the environment. While some influences invariably arise from organismal energy and material uptake [i.e., eating and drinking] and waste production, many organisms alter physical structure and change chemical reactivity in ways that are independent of their assimilatory [i.e., uptake] and dissimilatory [i.e., output] influence....

[But] ecological textbooks have rarely included such effects among the roster of important forces structuring ecological populations and communities or influencing ecosystem functioning; instead, they have traditionally focused on interactions such as competition and predation, or emphasized metabolically regulated nutrient [i.e., food chains and

article highlights

- Since Darwin’s time, evolutionary ecologists have often assumed that organisms are passively shaped by their physical environments.
- However, there is strong evidence that creatures possess innate abilities to proactively change and influence their environments.
- The ecosystem engineering we see in nature is intentional. God, as the ultimate Engineer, has programmed each creature with what it needs to fill the earth.

biogeochemical cycles] and energy flows.⁴

In other words, ecologists have largely discussed food chains, the water cycle, biomass production, and other topics that link to the Darwinian fascination with “survival of the fittest” competition among species.⁵ Because Darwinists assume that inanimate environments are actively shaping and sculpting organisms on Earth, they imagine organisms as primarily *passive* life forms. But organisms are quite active in pioneering and dealing with their habitats—sometimes aggressively so.⁶ Accordingly, this evolutionary blind spot has retarded Darwinists’ sensitivity to how animals impact their own environments in big and small ways.^{5,7}

Some examples are too conspicuous to ignore, such as dam-building beavers or reef-forming mollusks. But the habitat modifications produced by other creatures have often gone unnoticed because they occurred underground, or underwater, or were otherwise “hidden in plain sight.” Eventually, the activist traits of many animals were rec-



ognized by open-minded ecosystem investigators.

It was to incorporate this variety of abiotic environmental modification by organisms, along with its numerous consequences, that [Dr. Clive G.] Jones and colleagues (1994) proposed the concept of ecosystem engineering. In their first article on the topic, they defined ecosystem engineers as “organisms that directly or indirectly modulate the availability of resources (other than themselves) to other species by causing...state changes in biotic [i.e., living] or abiotic [i.e., non-living] materials. In so doing they modify, maintain and/or create habitats” (Jones et al. 1994).

This and a subsequent article...laid out the concept of ecosystem engineering, providing models, initial formal definitions, illustrative examples, postulates, general questions that needed to be answered, and a challenge to the ecological community to develop and refine these ideas.⁴

Animals Can Proactively Alter Environments

Some animals drastically modify the abiotic environments in which they live. Beavers build dams that change waterflow in freshwater streams. They also fell trees and thus remove obstacles to sunlight. Termites radically alter soil with interconnected tunnels and air columns above ground, with mounds that can reach eight feet high!

Reef-forming mollusks construct huge underwater structures that provide shelter for marine life as well as obstacles to underwater currents. Walrus disturb sea sediments as they hunt clams, reshaping large patches of seafloor invertebrate community “real estate.” Earthworms recycle nitrogen-fixed compounds in soil, increasing subsoil aeration and water drainage and forming networks of underground burrow-tunnels.

Other examples include alligators, bison, caddisflies, corvids, ghost shrimp, mole-rats, mycorrhizal fungi, periwinkles, pikas, and salmon.

Do Ecosystem Engineering Explanations Clarify Ecology?

The previous simplistic “keystone” ecological approach assumed that one super-influential animal was the essential foundation needed to facilitate a local habitat. But the ecosystem engineering approach recognizes that many organisms simultaneously play different yet interdependent roles in influencing the options and interactions of a habitat’s community of life forms. They also impact the nonliving geophysical ingredients within that given habitat.⁴ This is similar to how simplistic notions of food

chains have been replaced by analysis of complex food webs.

This new ecosystem engineering approach to examining the geophysical impacts of organisms has highlighted how animals are *not* primarily passive products of inanimate geophysical “sculptors.” Environments are not selective “potters” and animals are not malleable clay. Dr. Randy Guliuzza’s *Acts & Facts* Engineered Adaptability series has repeatedly documented how animals actively fill new and changing habitats by detecting and *self-adjusting* to new conditions.⁶

Beyond self-adjusting, creatures variously alter their habitats, from the modest effect of a bird’s nest in tree branches to the enormously influential picoplankton-filtration impact of Chesapeake Bay oysters and mussels that prevents algal bloom and low-oxygen dead zones in estuarial waters.⁷ But ecosystem engineering analysis doesn’t go far enough in its observations and explanations because it ignores God’s big-picture purposes and designs as it credits bacteria and earthworms with engineer-like wisdom.

Ecosystem Engineering Concepts Fall Short

Thus, the term “ecosystem engineering” is misleading. It distractingly treats the habitat-changing animals as if they are intelligent engineers that inventively utilize mechanical solutions that impact geophysical environments. In short, the engineering genius involved in nature is God’s, not the animals He created.

Even early critics of the ecosystem engineering term faulted the phrase as implying humanlike engineering “intent.”⁴ Whenever animals modify their habitats in physical ways, Christians should recognize the engineering “intent” as God staging an ongoing drama to “fill the earth,” which has always been His purpose for His creatures.⁸ Without the big picture of God’s Word, people will continue to learn without reaching true knowledge, and ecosystem engineering explanations will continue to miss the mark. ✎

References

1. 1 Samuel 5:2-4.
2. Johnson, J. J. S. 2010. Tackling Charges of Biblical Inconsistency: Putting the Pieces Together to Form the Big Picture. *Acts & Facts*. 39 (7): 8-9. Secularists, consciously or unconsciously, don’t like to be told by God how to understand creation, so they try to solve nature’s puzzles without consulting Scripture for facts or insights.
3. Jones, C. G., J. H. Lawton, and M. Shachak. 1994. Organisms as Ecosystem Engineers. *Oikos*. 69: 373-386.
4. Wright, J. and C. G. Jones. 2006. The Concept of Organisms as Ecosystem Engineers Ten Years On: Progress, Limitations, and Challenges. *BioScience*. 56 (3): 203-209.
5. With all the Darwinist emphasis on antagonistic competition between species, the ecological realities of mutualistic neighborliness in biotic communities was downplayed and/or dismissed. Johnson, J. J. S. 2010. Misreading Earth’s Groanings: Why Evolutionists and Intelligent Design Proponents Fail Ecology 101. *Acts & Facts*. 39 (8): 8-9; Johnson, J. J. S. 2018. Grand Canyon Neighbors: Pines, Truffles, and Squirrels. *Acts & Facts*. 47 (10): 21; Johnson, J. J. S. 2017. Cactus, Bats, and Christmas Gift-Giving. *Acts & Facts*. 46 (12): 21.
6. For example, see Guliuzza, R. J. 2018. Engineered Adaptability: Fast Adaptation Confirms Design-Based Model. *Acts & Facts*. 47 (9): 18-20; Guliuzza, R. J. 2018. Engineered Adaptability: Sensor Triggers Affirm Intelligently Designed Internalism. *Acts & Facts*. 47 (2): 17-19.
7. Pipkin, W. 2018. Freshwater bivalves flexing their muscles as water filterers. *Chesapeake Bay Journal*. 28 (7): 1; Gedan, K. B., L. Kellogg, and D. L. Breitburg. 2014. Accounting for Multiple Foundation Species in Oyster Reef Restoration Benefits. *Restoration Ecology*. 22 (4): 517, cited in Virginia Institute of Marine Science. Study puts some mussels into Chesapeake Bay restoration. *ScienceDaily*. Posted on sciencedaily.com September 8, 2014, accessed December 20, 2018.
8. Genesis 1:22, 28.

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



Better, Stronger, and More Effective Ministry

The Institute for Creation Research, the first full-time organization dedicated to creation science research, has grown tremendously since its inception in 1970. Financial support was rather lean during the early years, but God was faithful to supply as believers responded to monthly updates in *Acts & Facts* and occasional appeals. Today, everyone at ICR shares my deep sense of gratitude for those who financially labor with us in ministry. Lord willing, we are prayerfully confident this support will continue.

That said, major projects rarely move forward without large gifts to underwrite them. ICR's own history bears witness to this. Significant gifts were vital to research projects such as expeditions to Mount Ararat in the '70s and '80s and our landmark RATE initiative over a decade ago. They also made two major location moves possible, the first into our own facility in San Diego and the second to our current multi-building campus in Dallas. In California, they funded new office construction and heavily underwrote our first museum. In Dallas, they enabled ICR to hire personnel, make needed renovations to our facilities, and purchase property for the ICR Discovery Center for Science and Earth History. Large gifts even made possible our quarterly devotional *Days of Praise*, an outreach offered free of charge for four decades. These significant gifts helped make ICR a better, stronger, and more effective ministry for God.

Too strong a focus on big gifts can lead to real dangers, however, so please don't misunderstand me.

article highlights

- God has provided for the Institute for Creation Research for almost 50 years.
- Unexpected significant gifts have come in and funded major creation science efforts.
- Greater financial support would open more opportunities for the unique talents and capabilities God has brought together at ICR.
- Please stand with us on the front lines in prayer and support.

Smaller gifts are essential to ICR's ministry, and we remain debt-free as a testament to God's provision through faithful supporters and our careful stewardship of the funds He has granted us. But we cannot ignore the impact that significant gifts have made in the past—and can make in the future. Frankly, large gifts are often the missing ingredient needed to unleash the full potential of ICR's capabilities.

Placed into proper perspective, consider that less than 0.05% of the gifts ICR received over the past decade were valued

at \$25,000 or more. And of these, roughly a third came from estates of long-time supporters the Lord had called home. Nearly all of these substantial gifts were unsolicited and came as a complete surprise to us, often arriving at critical times just when the ministry needed them most. God has been good to us, but greater financial resources would open more opportunities for the unique talents and capabilities He has brought together at ICR. There's so much more we can do, if God enables it.

The battle has escalated to new heights in recent years, and our adversary is "roaring" like never before (1 Peter 5:8). An entire generation is growing up in a world beset by amoral cultural norms that dispute, devalue, and disparage the most basic of biblical doctrine. ICR has the scientific muscle, intellectual prowess, and biblical commitment to combat these threats, but not without considerable help from God's people.

ICR's current initiative, the ICR Discovery Center for Science and Earth History, is poised to advance the cause of our Creator through the public display of scientific evidence that confirms the Bible is right and its message is true. We can impact coming generations with evidence that destroys evolutionary speculations—but only if God's people help us move the ministry forward in 2019. If there ever was a time to help ICR and the Discovery Center, now is that time. Pray for us, and please help if you are able. ✍

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



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ICR is a recognized 501(c)(3) nonprofit ministry, and all gifts are tax-deductible to the fullest extent allowed by law.



Thank you for your devoted posts and articles. I love to read and share them! **I've been a science nerd and live a renewed life for Jesus.** I really, really appreciate and am on fire for all ICR desires to accomplish in the Lord.

— C. A.

We've followed ICR since they started. Am ever so anxious to see the [Discovery Center] museum in Dallas!

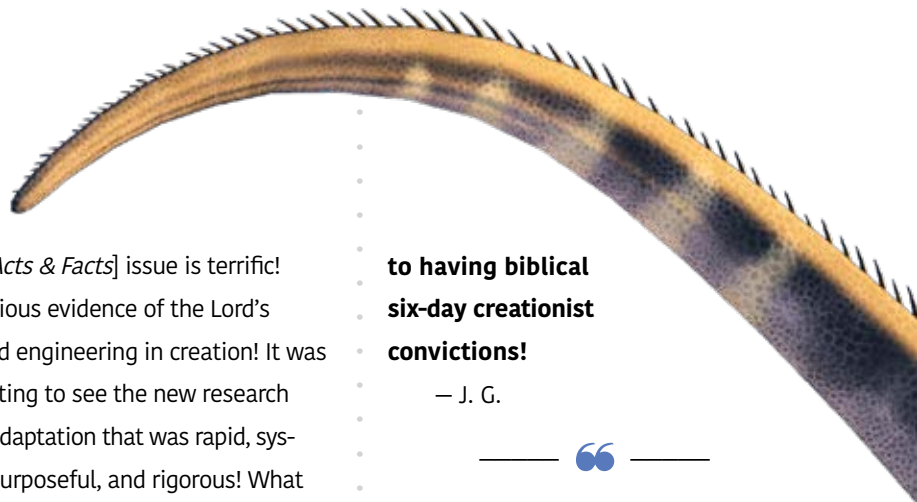
— D. L.

Mankind needs to understand the truths of creation as taught by ICR, without which mankind can easily be deceived—even the elect. **ICR is diligent to utilize all of Scripture and true science to reinforce the revealed Word of God.** Current archaeological findings and scientific discoveries in several disciplines are explained in light of Scripture by brilliant and disciplined minds who are dedicated to truth rather than a popular agenda.

— W. A.



Outstanding empirical research! The biological networks article [Engineered Adaptability: Biological Networks Feature Finest Engineering Principles] in the



January [Acts & Facts] issue is terrific! What glorious evidence of the Lord's genius and engineering in creation! It was so interesting to see the new research showing adaptation that was rapid, systematic, purposeful, and rigorous! What a joy to read Dr. [Randy] Guliuzza's wonderful article!

— M. M. G.

Nearly 30 years ago, ICR opened my eyes to true science!

— P. J. M.



I met Dr. [Henry] Morris when he was still teaching at VPI (Virginia Polytechnic Institute). He came to my college campus in Harrisonburg, VA, in the late '60s for weekend lectures. Have been with ICR ever since.

— B. P. L.



[Dr. Henry M. Morris] was certainly the father of modern creationism. **God used him so greatly with me as a new believer—a former atheist—in**

the 1970s to be transformed from evolutionary thinking



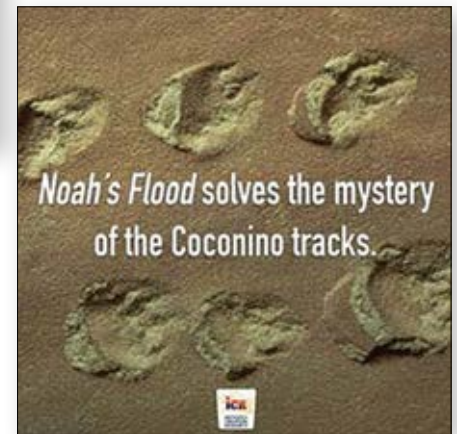
to having biblical six-day creationist convictions!

— J. G.



Thank you so much for providing the wonderful [Acts & Facts] resource for free! Much goes over my head, yet I so look forward to reading Jayme [Durant] (I'd love to meet up with her for coffee) and Dr. [Henry] Morris [III]—always edifying. You all do so much for His Kingdom and to encourage His saints.

— S. S.



I enjoy Brian Thomas' phraseology almost as much as his science.

— S. T.

Editor's note: We do, too!

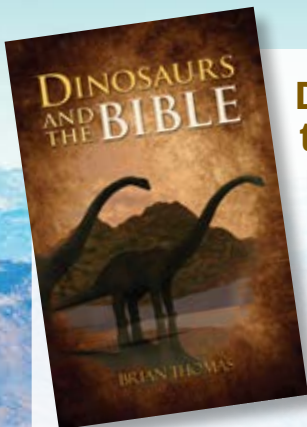
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