

# ACTS & FACTS

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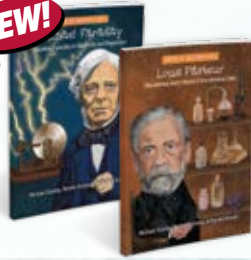
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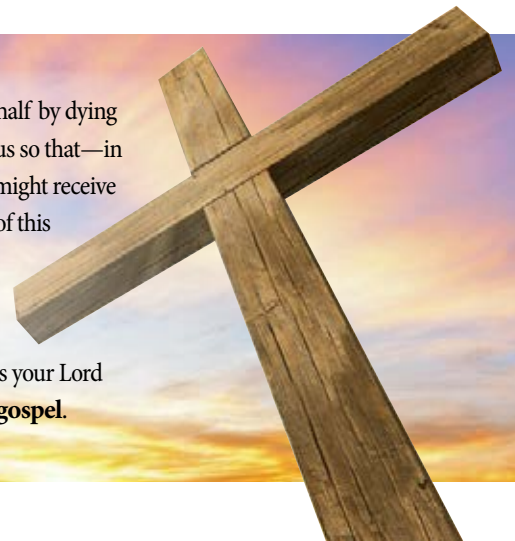


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## DESIGNER

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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Front cover: *Arabidopsis* seedling  
Image credit: Bigstock | kovalvs



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# The Transforming Influence of Genesis

## Worker Dignity and Safety

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

When Pharisees questioned the Lord Jesus about marriage, He answered by quoting Genesis 1:27: “But from the beginning of the creation, God ‘made them male and female’” (Mark 10:6). Jesus interpreted the words in Genesis as describing factual and historical events that were still applicable to His day and age. That same Word remains “profitable for doctrine, for reproof, for correction, for instruction in righteousness” for us today (2 Timothy 3:16).

Longtime readers of *Acts & Facts* will be broadly educated on why the doctrine of creation is fundamental to Christian faith.<sup>1</sup> It touches all areas of life, including our day-to-day work. Drs. Henry M. and John D. Morris wrote on the importance of human work and its origination at creation.<sup>2</sup> But another fascinating story that started

about 500 years ago and continues today demonstrates the profound influence for good that biblical doctrine and Bible-believing Christians exercise within a society’s workplaces.

### Workers and the Christian Worldview

Christian heritage and doctrine have had a remarkable effect in the workaday world of Western culture. For instance, why do Americans enjoy workplace safeties and privileges that are unheard of in other parts of the world? Why are sons no longer expected to take up the trades of their fathers? Why try to protect workers from danger in the workplace?

Some countries seem to discount these important questions. Yet wherever Christianity has spread, the establishment and recog-





nition of peoples' freedoms and rights have been foundational precepts. Quickly thereafter, however, secular leaders or organizations assumed credit and disregarded or forgot the pioneering Christian backdrop.

But creationists shouldn't forget. Heritage matters. Just as American history helps mold the beliefs and behaviors of Americans today, what we Christians believe and hold precious about ourselves is also influenced by our faith history. Our Christian ancestors did much that we should know, admire, and emulate.

Doctrine is very important, but the Bible's historical influence is often overlooked. If one reads about Labor Day on the U.S. Department of Labor website, nothing is mentioned about the biblical truths that changed how society viewed ordinary workers. But these truths provided the moral foundation for making laws to protect workers. That transformative Christian view of the inherent value of individuals goes back to Genesis 1:27, which reveals that all humans are created "in the image of God" and are not to be abused (Genesis 9:6) or misused (James 3:8–9).



### The World's View: Occupational Standing Equals Social Standing

Sometime before my deployment to Iraq as an Air Force officer, I read an astonishing headline: "Iraqi Peasant Shoots Down Apache Helicopter."<sup>3</sup> While the feat it claimed is surprising, what's stunning is that in the 2000s someone's occupational standing was still "peasant." It's possible that this person had no work-related legal protections for safety, health, or remuneration and that since the 1400s little has changed in that part of the world for people labeled peasants.

Millions worldwide still perform underappreciated and unnecessarily dangerous jobs. People given similar titles—such as peon, serf, slave, or chattel—have historically had little value given to their health or life. In some societies, the view still hasn't changed that people in certain societal castes or classes are inferior, are destined to occupy dangerous jobs, or don't deserve protection.

No culture has been exempt from these views. For centuries people considered it natural that everyone was born into a particular "station." In Europe and other places there was a class system with royals at the top. Sons of fathers who had dangerous, dirty jobs had meager hope of something better. There was also a distinction between sacred and secular work. The clerical hierarchy, monks, friars, and nuns performed what was considered the highest work while the secular realm had its own pecking order ranging from royal work, noble work, magisterial work, technical work, craftwork, on down to the work of so-called peons.

The value of people was not measured by an intrinsic quality like bearing the image of God but by their station in life. Only those of worthy pedigree were deserving of occupational protections. Unfortunately, the old belief that occupational standing equals social standing remains quite new in some places.

### How Biblical Teaching Changed Society

The respect and protections that workers enjoy today in America began with a major religious reformation in Europe in the sixteenth and seventeenth centuries. This religious awakening primarily sought to correct abuses within the established ecclesiastical order by elevating the Bible's authority personally and within the church. But its effect spread beyond the religious sphere.

Unlike many of today's secular societies, Christian religion influenced many facets of life within Europe from the 1400s to the 1700s. The Bible's authority exceeded centuries-old beliefs considered to be a natural law of society. Biblical truths even began to profoundly change views about work.

One of the first maxims to be undone by the reformers was that





## The Basis for Occupational Reforms Was Theological in Nature

Major changes in religious beliefs slowly preceded changes in society. The Bible teaches that “the image of God” that God imparted to the man and the woman on the sixth day of creation is the key distinction between humans and animals. Unfortunately, even in predominantly Christian countries many people don’t believe or act as if their fellow humans are made in God’s image. But after the Reformation, as expressed in charters and declarations going forward, a fundamental philosophical shift about the nature and value of humans occurred.

The biblical doctrine of God’s sovereignty radically modified the view of human occupations. Since all of life was God’s, daily work should be integrated with one’s religious devotion. All work could—and should—be sacred if done for Christ’s glory. The integration of God, society, and self all converged in the exercise of one’s “calling.”

Today we may use the word vocation instead of calling, but a calling entails so much more. Perkins’ treatise conveyed this biblically derived concept of calling:

God is the General appointing to every man his particular calling....God Himself is the author and beginning of callings.... Every person of every degree, state, sex or condition without exception, must have some personal and particular calling to walk in....Every one, rich or poor, man or woman, is bound to have a personal calling, in which they must perform some duties for the common good, according to the measure of the gifts that God has bestowed on them.<sup>7</sup>

Thus, all people were enjoined to seek a calling for *any* occupation. This was a serious matter that they were urged to consider after much consultation and prayer.

Since a calling to any one vocation wasn’t considered more honorable than others—honor was derived from how a job was performed and the motivations for performing it—Perkins taught that distinctions between secular and sacred work were to be shunned and not dignified.

Hereby is overthrown the condition of monks and friars, who challenge themselves that they live in a state of perfection, because they live apart from the societies of men in fasting and prayer, which appertain to all Christians, every man must have a particular and personal calling that he may be a good and profitable member of some society.<sup>8</sup>

Perkins had another compelling insight into Scripture: God instituted work not to segregate people into classes but to dignify them as they completed their callings through service to society. This means

occupations were naturally separated into sacred and secular work. Consider a radically different thought about laborers from a commentary on Genesis by Martin Luther.

When a maid cooks and cleans and does other housework, because God’s command is there, even such a small work shall be praised as service of God far surpassing the holiness and asceticism of all monks and nuns....These works in connection with the household are more desirable than all the works of all the monks and nuns....Seemingly secular works are a worship of God and an obedience well pleasing to God.<sup>4</sup>

Another widely read theologian in the late 1500s with lucid and practical sermons was William Perkins, who greatly inspired Europeans and Americans. His sermon *A Treatise of the Vocations or Callings of Men, With Sorts and Kinds of Them, and the Right Use Thereof* is credited with being the most influential piece stimulating a basic change in the value of “common work” and the “common man” who did it.<sup>5</sup>

English bishop and reformer Hugh Latimer was a student of Perkins’ work. In a message that referenced Perkins’ treatise he stated,

This is a wonderful thing, that the Savior of the World, and the King above all kings, was not ashamed to labor; yea, and to use so simple an occupation [as a carpenter]. Here He did sanctify all manner of occupations.<sup>6</sup>

Before the dominating traditional social order could change, people’s thinking about truth, morality, and other people had to change.



that people were not created to serve God *within* their work, but to serve Him *through* their work. Perkins asserted,

The main end of our lives...is to serve God in the serving of men in the works of our callings....Some man will say perchance: What, must we not labor in our callings to maintain our families? I answer: this must be done; but this is not the scope and end of our lives. The true end of our lives is to do service to God in serving of man.<sup>9</sup>

Beloved preacher Richard Baxter, ministering soon after Perkins' death, urged people,

Choose that employment or calling in which you may be most serviceable to God. Choose not that in which you may be most rich or honorable in the world; but that in which you may do the most good.<sup>10</sup>

One powerful personal benefit that resulted from this perspective was contentment. The belief that one was doing exactly what Jesus desired was a hedge against occupational boasting or envy.

How Christians should work is derived from Colossians 3:23: "And whatever you do, do it heartily, as to the Lord and not to men." This spawned the so-called New England work ethic. Though maligned in stereotypical Hollywood depictions of sour workaholics hating idleness and shunning relaxation, in truth many of the concepts underlying success are embodied in it, such as diligence, high standards, frugality, and thriftiness.

These virtues are considered valuable today. And the temperament of workers may be rather agreeable if they believe the influential theologian John Cotton's teaching that

we may not only aim at our own, but at the public good...and therefore faith will not think it has a comfortable calling unless it will not only serve his own turn but the turn of other men.<sup>11</sup>

Sharing the biblical value of honesty also impacted how people worked. Everyone was expected to take up a legal and "honest trade" while serving the Lord through "an honest day's work."

The belief of heartily undertaking one's work "as to the Lord" extended further to do one's work as the Lord did His. A novel belief grew in Christian communities that people shouldn't feel shame performing so-called lowly tasks, for even God's son Jesus was a servant to many and washed His disciples' feet (John 13:1–16). In commenting on the calling to serve others, John Cotton elaborated on the extent of its application: "So faith is ready to embrace any homely service his calling leads him to, which a carnal heart would blush to be seen in."<sup>12</sup>

Tending to unseemly human needs was beautifully demonstrated by the first American pilgrims who cared for one another—and

*"Every one, rich or poor, man or woman, is bound to have a personal calling, in which they must perform some duties for the common good, according to the measure of the gifts that God has bestowed on them."*

the *Mayflower* crew members who'd abused them—during their first tragic winter in North America.<sup>13</sup> The offshoot of this Christian belief was a broad understanding that no work is really menial and neither are the people who perform it.


## A Testament to the Foundational Creation Message

In some nations, recognizing the inherent value of all workers remains a bizarre or threatening ideol-

ogy. But Western society was enriched by Christians teaching a historical Genesis whose message affirmed that humans were created to work and that each person has inherent value by bearing God's image. Added was the example of Jesus Christ and the commitment of Christians to follow Him. The lesson from Perkins is that changed beliefs always precede changed policy.

Lack of a hierarchical religious/secular distinction, the intrinsic value of good work and of laborers who complete it, growing liberties for parents who want their children free to choose occupations outside their social "class," sacrificial service—many Americans consider these to be self-evident, even when they're uninformed about the theological roots from which the concepts grew.

This is a testimony to the lingering influence of Christian doctrine. The ripple effect of laws stipulating decent working conditions, protections from hazardous occupational exposures, disclosures about dangerous work products, compensation for job-sustained injuries, and better pay happens when citizens believe there's a solid moral justification to implement them.

By following the perfect example of the Lord Jesus and the Scriptures He affirmed, our Christian ancestors were a blessing to society—and Christians today should love and repeat this. 

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Dr. Guliuzza is the 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 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.



## MAY 2-3

Cambridge, MN  
Cambridge Christian School  
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(R. Guliuzza)

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Bayside Community Church  
(J. Johnson)  
BaysideCommunityChurch.net or 813.837.6007

## MAY 31, JUNE 2-3

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June 2—North Chapter Meeting, Beautiful Savior Lutheran Church,  
Antioch, IL  
June 3—West Chapter Meeting, Ministry Center, Carol Stream, IL  
**A Theory of Biological Design: Bringing an Overdue  
Revolution to Biology**  
(R. Guliuzza)  
MidwestCreationFellowship.org or 847.223.4730

## JUNE 1

Lake Zurich, IL  
Quentin Road Baptist Church  
(R. Guliuzza)  
info@QuentinRoad.org or 847.438.4494

## JUNE 1

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Grace Community Church  
(B. Thomas)  
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## JUNE 1-2

Farmington, NY  
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## JUNE 20

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## JUNE 21-22

SeaTac, WA  
Emmanuel Reformed Baptist Church  
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## AUGUST 13-16

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## SEPTEMBER 18-21



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## OCTOBER 17-18

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## SAVE THE DATE! SEPTEMBER 1

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# DINOSAUR NATIONAL MONUMENT

# Fossil Graveyard of the Flood

T I M C L A R E Y , P H . D .

## article highlights

- Visitors to Dinosaur National Monument not only see its impressive collection of dinosaur fossils but also many stunning land features.
- Conventional scientists believe rivers and floodplains laid down the thick and extensive rocks in which already-dead dinosaurs were buried and fossilized over millions of years.
- But this story doesn't adequately explain the fossils and types of rocks that are there.
- Instead, the massive fossil graveyard, the extent of the rocks, marine features, and Split Mountain Canyon suggest the immense power of the Genesis Flood is the best explanation for the monument's origins.

Straddling the border of Utah and Colorado, Dinosaur National Monument (DNM) is one of the richest exposures of dinosaur fossils in the world.<sup>1</sup> But not just dinosaurs are on display. DNM also contains equally breathtaking rock exposures and sheer canyons.

Visitors usually begin at the Quarry Visitor Center, located about 20 miles east of Vernal, Utah. Shuttle buses take them about a half mile to the Quarry Exhibit Hall where the dinosaur fossils are exposed in a steeply dipping wall of rock. About 30 miles east of this is the Canyon Visitor Center near Dinosaur, Colorado, which is the gateway to DNM's canyonlands. Overlooks along Harpers Corner Road allow visitors to view the canyon walls that rise several thousand feet above the Green and Yampa Rivers.





*The Quarry Exhibit Hall holds the park's wall of dinosaur fossils*

Image credit: NPS

Exhibit Hall allows visitors to view over 1,500 fossils still in place in an exposed sandstone wall of the Morrison Formation. Amazingly, many of the dinosaur fossils are either partially articulated (still together) or nearly complete.



*The death pose of this Camarasaurus fossil specimen indicates death by suffocation*

Image credit: Tim Clarey

the Tippecanoe). And below this stack of rocks are thick layers of pre-Sauk (Precambrian) sediments of the Uinta Mountain Group, totaling over 6,900 feet in thickness.<sup>3</sup> But how did this thick stack of sediments get here? And how did so many dinosaurs get buried in such a small area?



*Colorful rock layers exposed in Dinosaur National Monument*

Image credit: Clint Loveness



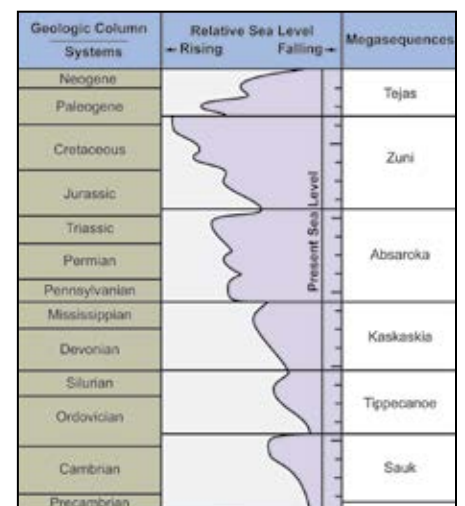
*The famous quarry wall shows a number of articulated dinosaur specimens*

Image credit: Clint Loveness

The story of DNM began on August 17, 1909, when Earl Douglass of the Carnegie Museum found eight vertebrae of an *Apatosaurus*. This discovery led to the opening of the famous Dinosaur Quarry.<sup>2</sup> In 1915, President Woodrow Wilson designated the 80 acres surrounding the quarry as a national monument. Since then, Presidents Franklin Roosevelt and Gerald Ford, with the help of the U.S. Congress, expanded the protected area to over 328 square miles (210,280 acres).<sup>2</sup>

Today, the fully enclosed Quarry

Because DNM is located on the eastern end of the Uinta Mountains, its eroded canyons expose many varieties of rocks.<sup>1</sup> Totalling about 8,000 feet in thickness, these colorful, fossil-rich sedimentary rocks include five of the six megasequences (all but



*Chart shows sea level changes during the Flood year and a progressively higher water level that peaked in the Zuni Megasequence. Higher water on the sea level curve is to the left.*

Image credit: Davis J. Werner



## The Conventional Account

The conventional explanation is that these rocks began accumulating hundreds of millions of years ago and built up slowly over vast eons. Evolutionary paleontologists believe the layer that contains the dinosaurs, the Morrison Formation, was deposited about 150 million years ago by a series of rivers and floodplains.<sup>4</sup>

Furthermore, conventional scientists postulate that hundreds of dinosaurs died in a drought, leaving their bones along a dry riverbed.<sup>4</sup> Later, rain-swollen rivers transported thousands of bones of at least 10 different dinosaur species into the deposit at Dinosaur Quarry.<sup>4</sup>

But there are some issues with this. The fossils and types of rocks in the Morrison Formation don't match the conventional story. Instead, three features observed at DNM point to an origin from the global Flood.

### 1. The Extent of the Morrison Formation

Although the Morrison Formation is only about 300 feet thick, it has a vast areal extent. It is very consistent in its layering,



*Map of the Morrison Formation's extent*

Image credit: Susan Windsor

sediment content, and color patterns, making it distinguishable across 600,000 square miles in the American West, from Canada to New Mexico. What rivers today deposit the exact same order of sand and clay beds uniformly across such a widespread expanse? Rivers carve sinuous, narrow channels within mud-dominated floodplains, not continuous sand and clay beds that correlate across 11 states.

The global Flood is a better explanation for this vast deposit and for the burial of the dinosaurs, too. Massive waves could easily deposit the same layers in the same order as wave after wave inundated the landscape. The dinosaurs were caught in one flow, similar to a logjam. The bed formed when the flow slowed and dropped its load of sediments and carcasses.

beds form by water flowing between 10 and 20 inches per second, creating ripples and thin-layered limestone beds similar to those observed at DNM.<sup>7</sup>

In addition, many distinctively marine seashells are found in the formation near DNM, including glauconite-rich sand beds.<sup>5</sup> The mineral glauconite is commonly accepted as an indicator of marine influence.

There is also a persistent chert layer in the Morrison. This single bed is about 0.5 to 3 inches thick and is referred to as the welded chert.<sup>5,8</sup> Chert, or flint, is a microcrystalline variety of quartz that is marine in origin. But what's startling is the remarkably persistent nature of this one thin layer.<sup>8</sup> This same thin chert bed has been found across Colorado, Kansas, Nebraska, New Mexico, South Dakota, Utah, and Wyoming.<sup>8</sup>



*The Morrison Formation at Dinosaur National Monument*

Image credit: Tim Clarey

### 2. A Marine Influence

The Morrison Formation reveals recognizable evidence of marine (ocean) influence.<sup>5,6</sup> For example, there are several rippled limestone layers up to 60 feet thick.<sup>5</sup> Limestone usually forms in a marine environment. And ripples indicate persistent currents were active during the deposition of these layers. Recent flume studies have shown that thin-layered, lime-rich mud

How can a single, few-inch-thick layer extend across so many states? Again, the global Flood provides the most reasonable answer. One massive tsunami-like wave with the right chemistry could spread a thin layer of chert across this vast region. Only ocean water transported by huge waves traveling across the continent can adequately explain the land and marine mixing that is observed in the Morrison. No conventional explanation has been satisfactory.



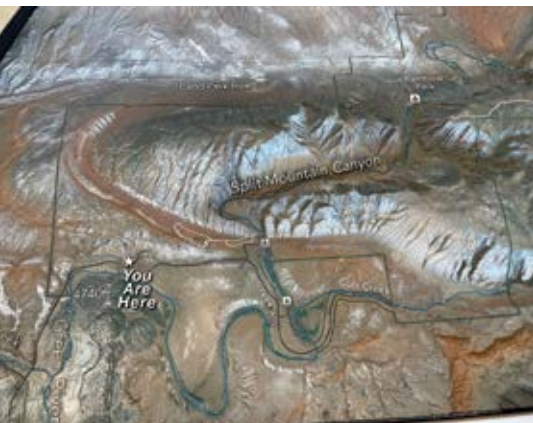


Dr. Jeffrey Tomkins studies the Camarasaurus frozen in a death pose. Its suffocation was caused by sudden burial during the Genesis Flood.

Image credit: Clint Loveness

### 3. River Through Split Mountain

Just north of the Quarry Visitor Center, Split Mountain is over 7,600 feet high. Oddly, the Green River cuts diagonally through it to form Split Mountain Canyon, which has walls of rock that rise over 2,500 feet from the river level. Why does the river run through the large uplifted block of rock instead of flowing around it?



3-D diorama in the Quarry Visitor Center showing the landscape of Dinosaur National Monument, including Split Mountain Canyon. "You Are Here" refers to the visitor center's location.

Image credit: Tim Clarey



Drs. Randy Guliuzza and Tim Clarey studying Split Mountain

Image credit: Clint Loveness

Some conventional scientists think these water gaps were carved by stream piracy, a unique process involving headward erosion.<sup>9</sup> This is very tricky because it requires two streams flowing in opposite directions to meet at the exact same point and then somehow erode away enough for one stream to take over the other—hence the piracy. But this explanation doesn't solve the problem. Even if the headwaters did touch at some time in the past, there is still a major drainage divide between the two rivers. Water would still flow away from the divide in opposite directions like it does all along the Continental Divide today.

A better explanation is that water once covered Split Mountain as the Flood reached its maximum height. Later, during the receding phase, sediments composing Split Mountain were folded upward into a cylinder shape.<sup>10</sup> As the fold rose, vertical cracks formed, cutting across the folded layers. Water draining off North America at the end of the Flood ripped into the cracks, eroding and deepening the canyon through Split Mountain. The rather small Green River resides in this canyon today.

### Conclusion

The features we observe at Dinosaur National Monument are reminders of the

immense power of the Flood in depositing vast layers early in the process, then eroding great quantities in the later phase. The mass collection of dinosaur bones and many other fossils, the extent of the Morrison Formation and its marine influence, and the deep canyon through Split Mountain are best explained by the global Flood. 🌊

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# Genomic Tandem Repeats Where Repetition Is Purposely Adaptive

J E F F R E Y P . T O M K I N S , P H . D .

**T**andem repeats (TRs) are short sequences of DNA repeated over and over again like the DNA letter sequence TACTACTAC, which is a repetition of TAC three times (Figure 1). In the early days of genomics, these tandem repeats were originally designated as nonfunctional or junk DNA. With the exception of a few cases of tandem repeats being involved in human disease, this type of repeat variation was often believed to be neutral in its effect on the organism.

However, over the past several decades scientists have shown that TRs are functional and designed DNA features. And contrary to initial declarations of them being nonfunctional, researchers have found that TRs and their variability in length have useful consequences in the biology, growth, and development of an organism

toward adaptive outcomes.

There are two different types of TRs.<sup>1</sup> One type called a micro-satellite consists of repeats in which the basic repeated unit consists of one to nine DNA letters (nucleotides). The second type are called minisatellites and consists of units that are greater than nine nucleotides (see Figure 1).

The variability in TRs consists in different lengths of the repeats such that one variation might contain 12 repeat units while another might have 13. Repeat variability can exist within the same genome on homologous chromosomes (one from the father and one from the mother) or between individuals of the same created kind, allowing for adaptive variation within a population.



1 unit = CTGA

...TCATCAG CTGA CTGA CTGA CTGA CTGA CCTAGCG... 5 units

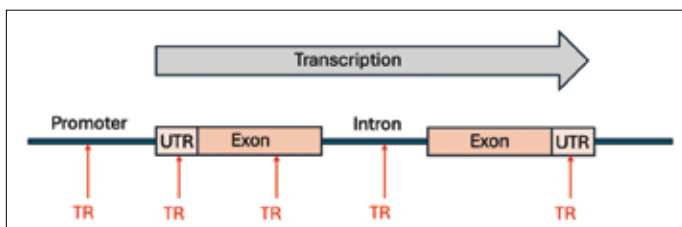
...TCATCAG CTGA CTGA CTGA CCTAGCG... 3 units

**Figure 1.** Illustration of a variable TR in the same stretch of DNA on two different chromosomes

The mechanisms for altering repeat lengths of a TR are still largely unknown, although there has been speculation concerning how this might occur. Some researchers have suggested it occurs during DNA replication and cell division or recombination, which takes place during meiosis (production of sperm and egg cells).<sup>1,2</sup>

The mere fact that TRs are a ubiquitous feature of genes points to their functionality and importance. The region at the beginning of a gene is called a promoter (gene regulatory feature). It has been determined that as many as 10% to 20% of eukaryotic gene promoters (found in creatures with a cell nucleus) contain TRs that function as regulatory switches.<sup>3</sup> But before we can delve into the phenomena of TRs in genes, we need to review how a gene is structured in a eukaryotic genome.<sup>4,5</sup>

First, it is important to understand that genes are in pieces. They contain regions called exons that code for a protein or functional RNAs (Figure 2) with intervening sections called introns between exons that do not code for proteins or functional RNAs. The introns contain many important signals and features but are spliced out of the RNA copy of the gene (messenger RNA or transcript). As noted above, regulatory TRs can be found in gene promoters, but they can also be found throughout the other parts of the gene (Figure 2).



**Figure 2.** Illustration of a gene with two exons (coding segments) and one intron (noncoding intervening sequence). The untranslated regions (UTRs) at the beginning of the first exon and last exon contain specialized codes that are not translated into proteins but carry signals that start and help terminate the production of a protein at the ribosome. As noted in the diagram, TRs (red) can be found throughout every part of a gene.

### Nonrandom Adaptive TRs in Gene-Coding Sequences

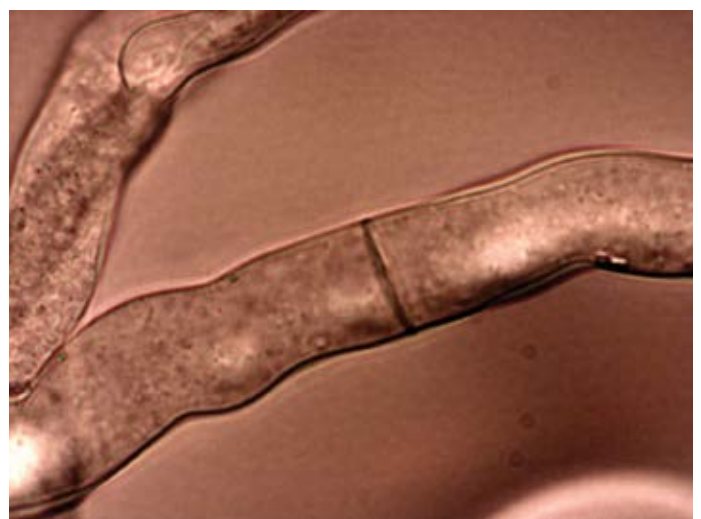
The first evidence that TRs cause adaptive and useful variation in the protein-coding regions of genes was found in several different types of bacteria in which the variable-length TRs would switch off

### article highlights

- Genomic tandem repeats (TRs) were once thought to be non-functional junk DNA, but recent studies show they are a key part of an organism's physiology, growth, and development.
- Research demonstrates that genomic TRs create genetic variation in bacteria, fungi, fish, fruit flies, plants, and shrubs. They are clearly nonrandom.
- Located in all major features of eukaryotic genes, TRs play a vital role in gene expression, which contributes to creatures' ability to rapidly adapt to changing environmental conditions.
- These incredibly complex design features in both plant and animal genomes facilitate adaptation. TRs can't be explained by random mutations but instead must be the work of the Creator, Jesus Christ.

or on the production of a cell membrane protein.<sup>3</sup> This in turn had significant effects on other proteins in the cell membrane. The end result was that the bacterial populations contained what was termed phase variation that facilitated rapid adaptation to a broad range of environmental conditions.

In another, more complex eukaryotic single-cell microbe, brewer's yeast, TRs are found in up to 22% of the coding regions of all genes.<sup>3</sup> And like bacteria, these variable-length TRs create adaptive population diversity that allows them to rapidly adjust to the conditions around them, e.g., generating dynamic protein interactions on the yeast's cell surface for optimized air-liquid interfaces. Other common yeast TRs occur in regulatory proteins (transcription factors) that have a broad effect upon the cell's genetic networks and circuits and even affect the epigenetic states of chromosomes.



*Filaments of Neurospora crassa*

Image credit: Roland Gromes, CC BY-SA 3.0

Circadian clock systems function in creatures to keep cells, organs, and the whole organism in sync during the day/night 24-hour

cycle.<sup>6,7</sup> In multicellular eukaryotes, variable-length TRs in coding regions have been shown to act as fine-tuning mechanisms for circadian clocks.<sup>3</sup>

Proteins are chains of amino acids. In the fungus *Neurospora crassa*, a gene encoding a transcription factor named White Collar-1 (WC-1) has a TR tract that codes for a repetitive string of glutamine amino acids in the WC-1 protein. Its variability in length acts like a fine-tuning knob. The population variability in the TR length enables the fungus to rapidly adjust its circadian clock to the environmental inputs of both the light cycle and temperature.

In the fruit fly, the *per* (period) gene has a six-base repeat that codes for a repetitive sequence of two amino acids, threonine and glycine. The two most common TR length variants in fly populations have either 17 or 20 repeats. The 17-repeat TR enables the flies to adjust their circadian clock under cold temperatures, while the 20-repeat TR allows clock adjustment under warm temperatures.

And a recent study showed that polyglutamine repeats in regulatory proteins derived from a TR of cytosine-adenine-guanine in two different genes (*CLOCK* and *BMAL1*) help regulate circadian clocks in several species of pelagic seabirds. This confers fine-tuned local adaptation to latitude and helps adjust breeding time.<sup>8</sup>

### Nonrandom Adaptive TRs in Regulatory Sequences

In addition to gene promoters that regulate gene expression, another important type of gene regulatory sequence is called an enhancer element, which can be hundreds of bases away from the gene or even embedded inside the gene. Both promoters and enhancers are activated by DNA-binding proteins called transcription factors that bind to specified target sequences within them. In these types of regulatory sequences, TRs have been found to play crucial roles in a

variety of biological processes with functional implications.<sup>9</sup> Certain TRs in promoters and enhancers themselves regulate gene expression by acting as binding sites for transcription factors.

When TRs occur in gene promoters, the variability in repeat length has been associated with a wide host of traits related to adaptability. In tilapia, an important aquacultural fish, variable repeats of CA have been found to occur in the promoter of an osmoregulatory gene called *PRL1*.<sup>3</sup> These TR variations confer a range of adaptability to water salinity. These variations are also associated with the size of the fish.

### Plants and Their TR-Based Adaption

Plants are tethered to the soil (sessile) and cannot get up and move to places that might be more favorable with fewer environmental challenges. As a result, they rely heavily on robust adaptive systems to prosper where they are planted, and their copious adaptive use of TRs in the genome is no exception.



*Nile tilapia*

Image credit: Germano Roberto Schuur, CC BY-SA 4.0



*Arabidopsis seedling*

Image credit: BigStock | kovals



In a recent study of the small weedy plant *Arabidopsis*, researchers analyzed many TRs in the genome, revealing that the TRs clustered near genes were involved in development, stress responses, and plant hormone pathways.<sup>10</sup> The data also demonstrated that the closer a TR is to a gene, the more likely it is to influence expression of that gene.


A surprising discovery was that TR sites in protein-coding sequences that encode repeated amino acids, as discussed above, also affect gene expression. For one protein in particular, it was experimentally verified that TR variation in the protein-coding region also created variation in the binding of transcription factors in the gene's promoter. Additionally, TR variation was found to be associated with multiple adaptive traits including root morphology, biotic stresses, abiotic stresses, and plant cell immune receptors.

employed a transcriptome—the set of all RNA transcripts present in a cell—to analyze gene expression across the whole genome for 12 different *Caragana* species across diverse locations in China. Their result was a large database of TR variations connected to active genes that were significantly linked to functional traits related to climate, altitude, and soil conditions (salinity and water availability).

The specific conclusion was that the variation of 264 gene-based TRs significantly controlled the expression of the genes in which they were located. Additionally, another 2,424 TRs were located in genes that had variable expression amongst *Caragana* species. Statistically, the expression of these genes was correlated with 19 different environmental adaptations and 16 different functional traits across the various habitats.

## Conclusion

Until the past several decades, TRs were considered to be nonfunctional DNA that had no purpose—so-called “junk DNA.”<sup>12</sup> While a number of variable-length TRs were initially shown to be connected to some heritable human diseases, a broad range of new studies discussed in this article are showing that TRs are clearly important design features of the genome that are involved in animal and plant adaptation.

Instead of being leftover evolutionary junk DNA, TRs demonstrate precise function and intricate engineering that could never arise through random means or natural processes. Once again, such a clever genetic mechanism points to the all-wise Creator, the Lord Jesus Christ. 

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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.



*Caragana arborescens*, weeping Siberian Peashrub

Image credit: Jonathan Teller-Elsberg, CC BY-SA 3.0

Another recent study was done with the Siberian peashrub *Caragana*, which is widely known for its remarkable adaptability to harsh environments across Siberia and China.<sup>11</sup> *Caragana* plants have very distinctive geographical distribution patterns that reflect a wide variety of adaptive trait variations in plant morphology, physiology, and biochemistry. This amazing array of innate biological diversity has made *Caragana* an ideal plant system for studying how TR variability may play a role in adaptation.

In this particular study, researchers identified variable TRs in a large number of genes in both coding and noncoding regions. They



# ICR Publishes University-Level Earth Science Textbook

**D**r. Richard Bliss, the former chair of ICR's department of science education, authored a pioneering study demonstrating that students who were taught both sides in the creation-evolution debate exhibited a greater mastery of the material than students who were only exposed to the evolutionary position.<sup>1</sup> This led ICR to adopt the two-model approach for teaching the creation-evolution controversy.<sup>2</sup> In that same spirit, ICR recently published an introductory college-level textbook, *Earth Systems: An Introduction to Earth System Origins, Structures, and Processes*.

This soft-bound, beautifully illustrated, full-color book discusses the worldview conflict between uniformitarian and creation thinking while providing an introductory survey of geology. It also addresses the most obvious point of contention between these worldviews as it relates to Earth science: the age of the earth. And although written for Christian college students, the uniformitarian position is treated respectfully.

Like most Earth science introductory texts, *Earth Systems* covers the basics—geology, mineralogy, oceanography, meteorology, and climate. Unlike most such texts, however, it does not hesitate to point out difficulties confronting the old-earth interpretation, such as the Cambrian Explosion, incorrect ages obtained from radiometric dating techniques, original soft tissue found in dinosaur and other fossils, and the absence of convincing evidence for the conventional Ice Age theory. The book also unashamedly quotes Scripture in every chapter!

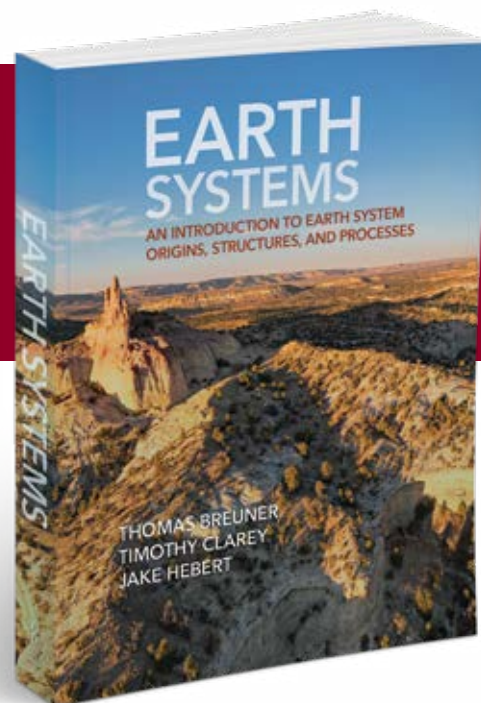
*Earth Systems* is the brainchild of Liberty University instructor and longtime creationist Thomas Breuner. He has a long

## article highlights

- Liberty University professor Thomas Breuner teamed up with ICR scientists Drs. Tim Clarey and Jake Hebert to develop a new textbook, *Earth Systems: An Introduction to Earth System Origins, Structures, and Processes*.
- This book includes the latest creation geology research on Flood layers, plate tectonics, oil creation, the Ice Age, and radiometric dating.
- Its data and explanations dismantle conventional old-earth geological interpretations and confirm the truth of biblical history.
- Through this textbook, students will learn about the harmony between science and the Bible.


relationship with ICR, having attended a class on coal stratigraphy taught by creation geologist Steve Austin at the ICR Graduate School in 1982. Tom requested that ICR be involved in this project, and ICR President Dr. Randy Guliuzza agreed. So Dr. Tim Clarey and I had the privilege of contributing to the writing of the book.

All three authors have past experience that helped prepare us for the task. Breuner has a master of science in geology and a master of arts in teaching. He was also a Fulbright exchange teacher to Hungary and the recipient of several awards for teaching excellence at Liberty University. Dr. Clarey earned a Ph.D. in geology, worked for over eight years as an exploration geologist, and taught geology classes at the college level for 17 years. My Ph.D. is in physics from the University of Texas at Dallas. Perhaps more importantly, I taught a college-level conceptual physics



class for five years, which gave me considerable experience in explaining technical concepts in easy-to-understand ways.

*Earth Systems* is designed for non-science majors, but it is sufficiently rigorous for college and even high school levels. Although equations are kept to a minimum, the book explains qualitatively, but in detail, the reasoning that uniformitarians use to reach their conclusions and why creationists dispute the assumptions underlying that reasoning. The book includes a thorough discussion of plate tectonics (including catastrophic plate tectonics), Flood geology, and the Ice Age.

In perusing the chapters written by my coauthors, I came across some information that I either didn't know or had forgotten, so even longtime creationists may find *Earth Systems* beneficial. Copies are available for purchase at both [ICR.org/store](http://ICR.org/store) and the ICR Discovery Center gift shop. 

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## The Pillars of Creation

Image credit: NASA, ESA, CSA, STScI

# Credit Only Our Creator

**H**istory was my favorite subject as a young kid. But it always puzzled me when my teachers said, “We study history so that we don’t repeat it.” Surely, I thought, we wouldn’t fall back into the same mistakes made thousands of years ago. Yet I later realized how easily humanity clings to old ideas, repackaging them in modern language. One of the clearest examples today is how evolutionists continue to deify nature—just like the “prescientific” civilizations did with their gods.

Many ancient peoples tried explaining existence by attributing natural occurrences to divine beings. The Greeks worshiped idols as representations of false gods that ruled the sky, sea, earth, and various aspects of life. One Norse god wielded his hammer to produce storms, while the Egyptians revered a sun god, among many others. Each culture built myths around their own deities, believing they controlled the forces of nature.

As technology advanced, this folklore gave way to scientific explanations. Thunder was no longer caused by a god but resulted from superheated air rapidly expanding. Seasonal changes weren’t due to a goddess’ grief but to Earth’s axial tilt. However, even as early modern scientists learned more about the universe, they didn’t view their findings as proof of nature’s will but as evidence of God’s design.

For example, Johannes Kepler, the founder of modern astronomy, agreed with the psalmist that “the heavens declare the glory of God” (Psalm 19:1). His laws of planetary motion described the mathematical order of the solar system as a reflection of divine craftsmanship.


Matthew Maury, the pathfinder of the seas, researched and made discoveries concerning ocean currents, wind patterns, and navigation because he was inspired by Psalm 8:8 referencing “the paths of the seas.”

And Michael Faraday, one of the greatest experimental scientists in history, discovered the principles of electromagnetism, which laid the groundwork for modern electrical technology. Faraday was a devout Christian who saw his work as uncovering the laws that God had set in place. He rejected the idea that nature operated on its own and instead believed that studying the natural world was a way to help understand the Creator’s wisdom.

While science today is considered to have replaced the old mythologies, many people still

speak of nature as if it possesses intelligence or will. Phrases like “Mother Nature” or “natural selection” suggest an intentional force at work. Evolutionists treat nature as an active agent that shapes creatures over time. That’s why scientists at the Institute for Creation Research are developing a new theory of biological design, illustrating how our Creator Jesus Christ engineered creatures to adapt to changing environments. Through this important research, ICR is equipping believers with scientific responses to combat anti-Creator evolutionary claims.

1 Corinthians 13:11 says, “When I was a child, I spoke as a child, I understood as a child, I thought as a child; but when I became a man, I put away childish things.” As a child clings to simple explanations and fairy tales, ancient civilizations used divine personalities to explain what they didn’t understand about nature. As adults, however, we should put away childish thinking. Immaturity and ignorance repeat history, deifying nature through attributing creative power to a mindless evolutionary process. This worldview also robs the Lord Jesus of His glory.

ICR stands firm on the Bible’s authority. Our vital mission is to expose false narratives and proclaim the scientific and scriptural evidence that indicate Christ’s handiwork. Thank you for your unwavering prayer and support. Together, we’re making history—not repeating it. 

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



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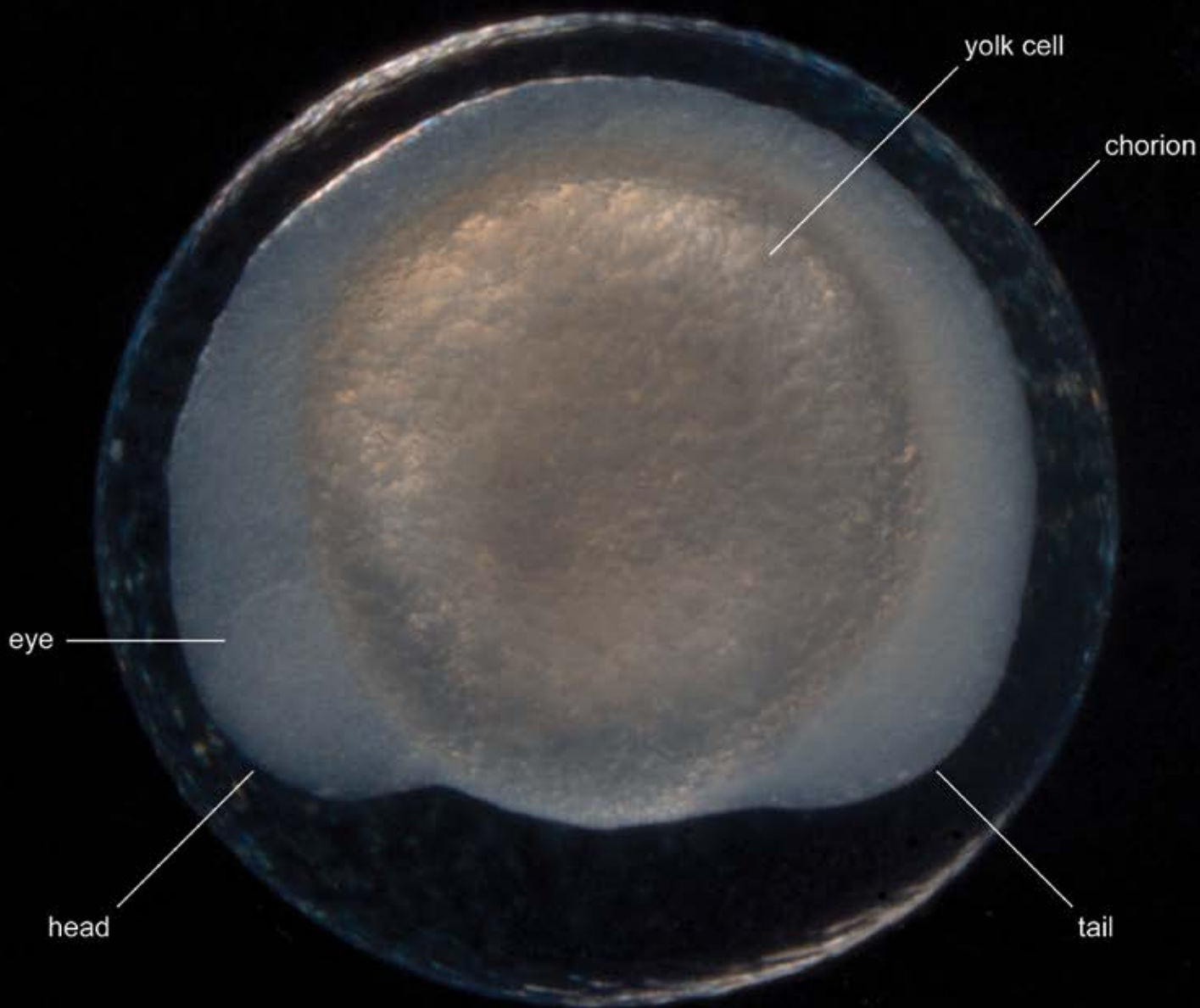
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*“So God created great sea creatures and every living thing that moves,  
with which the waters abounded, according to their kind, and every winged bird  
according to its kind. And God saw that it was good.”*

— G E N E S I S 1 : 2 1 —

*The embryo of a surface fish of *Astyanax mexicanus* at 12 hours of development. A spherical, semitransparent egg envelope (chorion) surrounds the embryo. At this stage, the developing fish is visible as a white band of cells and tissues wrapped around a central source of food (yolk cell).*

Image credit: Micrograph captured and edited by Michael J. Boyle, Ph.D., The William B. Dean, MD Imaging Center of the Institute for Creation Research

God's multifarious and marvelous designs for basic creature needs are so innovatively clever and providentially purposeful that Christ's workmanship is repeatedly and ubiquitously demonstrated.<sup>1</sup> Little furry mammals clearly display that Christ is the best chess master who understands every aspect of His creation and the best moves for every part of it.

How does someone master chess? Among other things, (1) thoroughly understand the pieces. (2) Plan strategically for both long-term and immediate goals. (3) Maintain positional awareness and calculate moves in advance. (4) Thoroughly know chess principles and how the game works.

Christ is the infinite chess master. With His infinite wisdom, He understood the specific needs, abilities, and vulnerabilities of the creatures He created and equipped them for the environments they'd occupy and the challenges they'd face. Our Creator designed and orchestrates all big and small creatures as they fill their respective ranges and niches on planet Earth.

Consider two basic animal needs: (a) eating useful food and (b) keeping safe from hostile weather and predators. God did not apply a one-size-fits-all solution to those challenges because He values variety.<sup>1</sup> Con-

## Playing Chess with Little Furry Critters



Image credit: Adrian Askew, CC BY 2.0

sider three small mammals with distinct abilities Christ provided for them to acquire suitable food and seek safety.<sup>1</sup>

### Rabbits

Rabbits are herbivores. Grasses, flowers, and seeds can't flee from hungry rabbits. However, many plants are not very digestible, so God equipped rabbits for coprophagy ("double digestion" systems). Rabbits benefit from hard-to-access plant nutrients by eating and digesting, then defecating, and then re-ingesting and re-digesting their food.<sup>2</sup>

What about safety? Rabbit hindlegs are powerful, allowing them to jump with speed and might. They can also evasively zigzag or circle to avoid capture—if they see the danger coming. Noticing predators is critical. Christ designed rabbits with almost full-circle horizontal fields of vision, and rabbit eyes can also scan some sky to have early warning of danger from above (e.g., hawks). A rabbit's vision is an invaluable part of its ability to speedily recognize and respond to hazards by making specific escapes.<sup>2</sup>

### Bats

Bats mostly eat flying insects—moths, midges, mayflies, mosquitoes, etc. Each furry prey is a tiny protein packet, so myriads must be captured and eaten to fuel the de-

manding metabolism of bats.<sup>2,3</sup> As Dr. Frank Sherwin has reported, bats are equipped to use in-flight echolocation to locate (and relocate multiple times with precision and speed) their "meals-on-wings" prey.<sup>4</sup>

Bats are also vulnerable to freezing winter conditions because keeping warm is costly and their favorite food is unavailable. God designed them to travel to warmer climates or to warmer dwellings inside caves or mines before winter.<sup>2</sup>

### Skunks

#### Skunks

are versatile omnivores, eating what is available. They mostly hunt small animals (mice, voles, earthworms, bird eggs, bugs) nocturnally and eat plant food (seeds, nuts, berries).<sup>2</sup>

For safety, however, skunks usually don't need to flee. Fight, not flight, is often their confrontational response to unwelcome intruders. Beware! Skunks are mustelids whose anal glands produce an oily and pungent (stinking!) spray that is aimed and projected with accuracy and repetition up to 15 feet!<sup>2</sup>

Earth's animals, including small furry mammals, display the Lord Jesus Christ's workmanship. The proof of His creatorship is so irrefutable that failing to glorify Him for His work in creation is inexcusable.<sup>5</sup>

#### References

1. Johnson, J. J. S. 2012. Valuing God's Variety. *Acts & Facts*. 41 (9): 8–9.
2. Tekiela, S. 2005. *Mammals of Minnesota Field Guide*. Cambridge, MN: Adventure Publications, 92–119 (bats), 200–207 (skunks), 208–219 (rabbits).
3. Bats have high-maintenance metabolism requirements. Lactating *Myotis lucifugus* bat mothers may eat their entire weight, nightly, in insects!
4. Sherwin, F. Bat Echolocation Defies Evolutionary Explanations. *Creation Science Update*. Posted on ICR.org January 31, 2022.
5. Romans 1:19–21; Job 12:7–9. These well-equipped animals cannot have originated from some kind of mystical animistic natural selection. Nor were these wee critters generated from imaginary entropy-conquering evolutionary luck.

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



### article highlights

- Christ programmed a variety of traits into creatures to help them find food and stay safe.
- Always on the lookout for predators, rabbits have almost 360° vision.
- Bats possess in-flight echolocation, enabling them to catch flying prey.
- Skunks have unique glands that produce their infamous defensive spray.
- Like a chess master, Christ's provision for creatures' diet and safety needs are creative and varied. They showcase predetermined design that no natural process could accomplish.





I have received your [Acts & Facts] magazine for years and after reading your Jan/Feb 2025 issue have felt convinced to write this thank you...! The article on Theodore Roosevelt National Park and photos were superb evidence of the Flood....**The article “Courage of Conviction” by James Gadberry was heart-convicting through God’s Word and the Holy Spirit of God.**

“Mice That Prey on Scorpions and Tarantulas” proved again that our God created everything perfectly, just like [in] so many other previous articles.

— C. B.

### Darwin, Hitler, and the Holocaust, Part 3

This [episode of *The Creation Podcast*] has been an absolute blessing to listen to and such an eye-opener! As someone who was raised in a secular household and recently came to Christ almost 6 years ago, I appreciate the work ICR does! This series was such an eye-opener to



the damage [evolutionary] thinking does and how it creeps in, settles down, and takes root.

— P. P.

### A Theory Designed to Be...Anti-Design

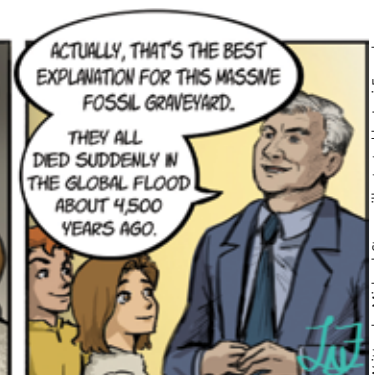
I love this ministry! **The information here has strengthened my walk in Christ.** I listen to [*The Creation Podcast*] episodes many times to memorize. As a severe dyslexic, I'd never have access to 90% of what you share.

— K. P.

Genius!

— J. S.

**Editor’s note:** You can see these episodes of *The Creation Podcast* and other online programs at [ICR.org/podcasts](http://ICR.org/podcasts). And be sure to check out our social media platforms at [ICR.org/followicr](http://ICR.org/followicr).



Written by Michael Stamp, illustrated by Lori Fausak

Along with this modest donation **we want to also mention how appreciative we are for the daily devotion booklet [Days of Praise]** we have received for years with the very well-thought-out and succinctly written messages. We have often read the small message on a certain day and shared it with someone else. **They are clear nuggets of truth which are always biblically sound.** So, please pass this note on to all the contributing writers and everyone behind the scenes who make this little publication.

— M. & L.

I love the article [Dr. Randy Guliuzza] did on Jesus [“Jesus—There’s Just Something About That Name” in the March/April *Acts & Facts*]. I made a copy and gave it to one of our associate pastors at my church. **It was so good in reference to Jesus’ name!...**I really enjoyed the article [“What Is Truth?” by Omorinsola Ajayi] as well.... Blessings on you.

— A.M.J.



Thank you for your work. We pray the Lord bless you and keep you. We pray also that your work would be valuable for the kingdom of God. Fight the big lie of Satan with Jesus, the Way, the Truth and the Life. Be strong and courageous.

— G. & C. S.

Have a comment?

Email [Editor@ICR.org](mailto:Editor@ICR.org) or write to

Editor, P. O. Box 59029, Dallas, TX 75229.

**Unfortunately, ICR is unable to respond to all correspondence or accept unsolicited manuscripts, books, email attachments, or other materials.**

Crystals are like hidden treasures the Lord Jesus placed in nature! Some are precious, like diamonds and emeralds. But the word “crystal” actually describes more than sparkly gemstones. Everything you see is made of tiny particles called atoms. When these itty-bitty units fit together in a repeating pattern, they form a crystal! Did you also know...



Amethyst

- ✓ Gemstone crystals are created by heat, pressure, and/or mineral-rich water.
- ✓ A geode is a rock that looks normal on the outside, but it's lined with crystals like amethyst on the inside.
- ✓ Other examples of crystals include table salt, sugar, and even snowflakes.

## Word Scramble

- |                  |                |
|------------------|----------------|
| 1. yslatrc _____ | 4. eoged _____ |
| 2. omat _____    | 5. tasl _____  |
| 3. ieamnlr _____ | 6. crko _____  |

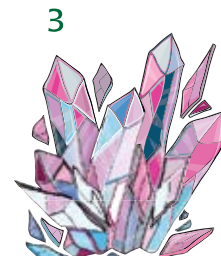
## Make-Your-Own Rock Candy

Supplies: water, sugar, a glass jar, clothespins, skewers, and food coloring and flavoring (optional)

1. With an adult's help, heat 1 cup of water and slowly add 3½ cups of sugar. Let boil for 10 minutes. Add coloring and flavoring.
2. Dip half of each skewer into the liquid, then coat with sugar. Let dry.
3. Meanwhile, pour the solution into the jar. Let cool.
4. Place the coated skewers into the jar and clamp them with clothespins. Note: the skewers shouldn't rest against the bottom of the jar.
5. Leave the jar alone for 4–5 days to let the crystals grow!



Find the two matching crystals.



Answers to the matching crystals: 2, 4; word scramble: crystal, atom, mineral, geode, salt, rock



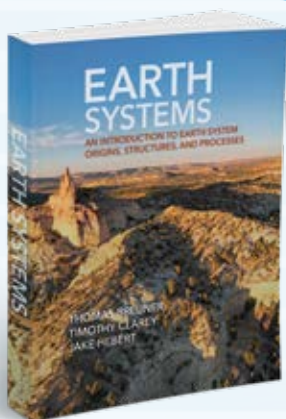
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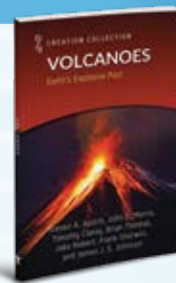
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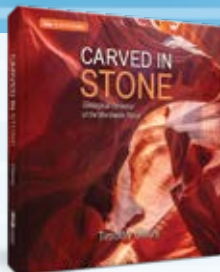
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