

# Creation Matters

Volume 24 Number 3  
May / June 2019

A publication of the  
Creation Research Society

## Mature Soil and Microbial Life at Day 3

by Glenn V. Wilson

Most children's Bible studies teach that plants were created on Day 3, sun and stars on Day 4, fish and birds on Day 5, animals and humans on Day 6 — but when was the ultra-important microbial life created? Genesis 1:9–10 says:

<sup>9</sup>Then God said, "Let the waters below the heavens be gathered into one place, and let the dry land (*ya-bashah*) appear"; and it was so. <sup>10</sup>God called the dry land earth (*aretz*), and the gathering of the waters He called seas; and God saw that it was good. [NASB]

Wilson and Locke (2018) pointed out that the scriptures do not say that God "created" the land on Day 3, but that the land "appeared," which is analogous to the description for the land's appearing after the flood waters receded. Gen 1:11–13 elaborates on this land by stating:

<sup>11</sup> Then God said, "Let the earth sprout vegetation, plants yielding seed, and fruit trees bearing fruit after their kind, with seed in them,



*For soil to be productive (i.e., "good"), soil macro- and micro-organisms in abundance are also required.*

on the earth"; and it was so. <sup>12</sup>The earth brought forth vegetation,

plants yielding seed after their kind, and trees bearing fruit with seed in them, after their kind; and God saw that it was good.<sup>13</sup> There was evening and there was morning, a third day. [NASB]

Given that scriptures interpret scripture, the parable of the sower in Luke 8:5–8 makes it clear that the land on Day 3 was not geologic material (bedrock) from which soil would eventually be produced by weathering, but was already "good" soil that "produced vegetation."

According to the USDA/NRCS (2019), "soil is a natural body comprised of solids (minerals and organic matter), liquid, and gases that occurs on the land surface, occupies space, and is characterized by one or both of the following: horizons, or layers, that are distinguishable from the initial material." This definition reflects the results of soil formation processes by stating that soil is "distinguishable from the initial material," which assumes that it is formed by weathering of a parent material. Soil

... continued on p.3

## Why Geology Matters

by  
Michael J. Oard, MS and  
John K. Reed, PhD

We have pointed out that origins and natural history are world-view issues, that an atheistic worldview dominates culture, and that the atheistic worldview can be traced to the 18<sup>th</sup> century Enlightenment. An early major offensive was the replacement of Noah's Flood as the primary explanation for the

## Is Uniformitarianism a Sound Principle?

rocks and fossils with a convoluted uniformitarianism, complete with the pithy maxim, "the present is the key to the past."

Though the principle was assumed by secularists throughout the 18<sup>th</sup> century, it was formalized by the comparatively minor amateur naturalist, James Hutton (1726–

1797), first in a 1785 article and then in his 1795 book. In the following years, his disciple, John Playfair (1748–1819) sanitized Hutton's view of its deistic theology, allowing Charles Lyell (1797–1875) to reformulate it as a secular theory in his three-volume book, *The Principles of Geology* (1830–1833).

*Uniformitarianism*, a term coined by William Whewell in 1832, became the fetish of modern geology, and despite mountains of contrary knowledge and a history of logical and empirical inconsistency, geologists still cling to its fading

... continued on p.4



# Dragonfly Wings and Other Things

The wing surface of many insects displays a delicate pattern of small adjacent cells. It resembles a honeycomb structure, with veins as cell boundaries. Similar to our fingerprints, no two wings are exactly alike in their cell shapes. The structure follows a pattern called a Voronoi tessellation, named for the Russian mathematician Georgy Voronoy (1868–908).

Voronoi diagrams can be generated manually or by computer. Interactive internet sites are available (see Figure 1 and (Beutel, n.d.)). The simplified diagram shown here is the result of following the voronoi algorithm. One begins with a number of random dots or nodes. Then straight lines are constructed midway between each of the neighboring points, two at a time. A line ends when it intersects another line. The result is that any point within an enclosed cell or region is closer to its own internal node than to any external node.

Continuing the simplified diagram with many additional nodes results in the detailed

dragonfly wing pattern (see Figure 2 and Hoffman et al., 2018). In this way, the wings are constructed following the complex geometric pattern according to their DNA instructions.

Similar Voronoi patterns also appear in leaf surface structures, convection currents in liquids, and even the patchy skin pattern of giraffes. Soap bubbles further extend the voronoi pattern to three dimensions. Mathematics is the language found throughout creation and dragonfly wings provide elegant examples.

## References

Beutel, A. n.d. *Interactive Voronoi Diagram Generator with WebGL*. Retrieved May 9, 2019 from <http://alexbeutel.com/webgl/voronoi.html>  
Hoffman, J., S. Donoughe, K. Li, M.K. Salcedo, and C.H. Rycroft. 2018. A simple developmental model recapitulates complex insect wing venation patterns. *Proc. Natl. Acad. Sci. U.S.A.* 115(40): Published online September 17, 2018. doi:10.1073/pnas.1721248115.

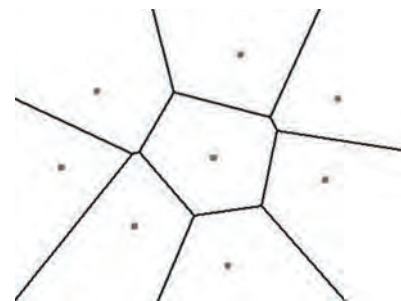


Figure 1

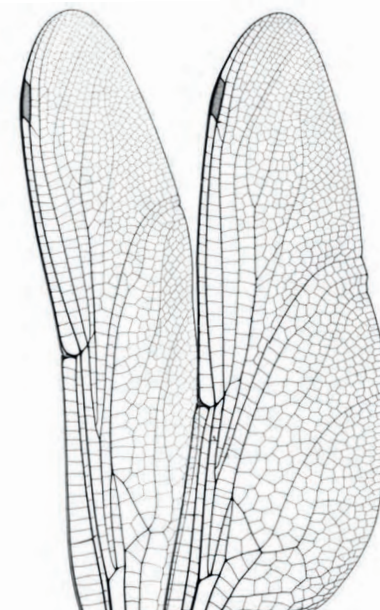


Figure 2



## Contents

**Mature Soil and Microbial Life at Day 3** .....1

**Why Geology Matters: Is Uniformitarianism a Sound Principle?**.....1

**Math Matters: Dragonfly Wings and Other Things** .....2

**Matters of Fact: Adaptation in Sticklebacks**.....7

**Speaking of Science**

Superlative New Hubble Deep Field Shouts “Awe”.....8

Natural Selection: Darwin’s All-Purpose Magic Wand.....8

Humans Are Still Evolving, All Right.....9

Inserting Darwin Where He Doesn’t Belong.....9

Designed Selection Is Not Evolution.....10

**Letters**

Superlative New Hubble Deep Field Shouts “Awe”.....11

**Annual CRS BOD Meeting Photos**.....10–11

**All by Design: Bats Play “Good dop” ... “Bad dop”**...12

## Creation Matters

ISSN 1094-6632  
Volume 24, Number 3  
May / June 2019

Copyright © 2018 Creation Research Society  
All rights reserved.

**Editor:**  
Glen W. Wolfrom  
**Assistant Editor:**  
Jean K. Lightner

For advertising rates and information for authors:

Glen W. Wolfrom, Editor  
Creation Research Society  
6801 N. Highway 89  
Chino Valley, AZ 86323-9186

Email: [CMeditor@creationresearch.org](mailto:CMeditor@creationresearch.org)  
Phone: 928.636.1153

**Creation Research Society Website:**  
[www.creationresearch.org](http://www.creationresearch.org)

Articles published in *Creation Matters* represent the opinions and beliefs of the authors, and do not necessarily reflect the official position of the CRS.

## Day 3 ...continued from page 1

scientists claim that it takes 100s to 1000s of years to form soil by natural weathering processes at today's rates, yet God's word implies that "good" soil existed on Day 3.

Two other aspects of this definition appear to be inconsistent with scripture, but instead reveal God's creative ability. For the land on Day 3 to be able to "produce vegetation," especially vegetation that "bears fruit," necessitates that (1) the soil mineral fraction included clays, and (2) the organic fraction included microorganisms.

### First inconsistency

Based on its texture, the mineral fraction of soil can be separated into its particle size fractions of sand (2 mm to 0.05 mm), silt (0.05 to 0.002 mm), and clay (<0.002 mm), according to the USDA classification system (USDA, 2017). Sand and silt are primary minerals derived directly from physical weathering of rock. Sands and silts are primarily composed of silicon and oxygen atoms (predominately quartz, SiO<sub>4</sub>) or calcium carbonates, and are rather inert (non-charged) particles.

In contrast, clay particles are fine-grained (typically < 0.002 mm), hydro-plastic (expand and contract) particles that harden when dried. Clays are thought to form over long periods of time by chemical weathering of rocks into basic chemical constituents that reform into secondary minerals. Clay formation predominately involves dissolved oxides (primarily aluminum, but also magnesium and iron) combining with silica oxides to form phyllosilicate minerals (SiAlO<sub>4</sub><sup>-</sup>). This process is typically by isomorphic substitution of Si<sup>4+</sup> by Al<sup>3+</sup>, which results in a negatively charged particle.

Clay particles also shrink and swell as they absorb and desorb water molecules within and along their edges. Anyone who has seen cracks in the surface of dry soil is seeing the evidence of these secondary clay particles, and oftentimes people have experienced the effects of swelling when driving down a highway that is uneven and bumpy. Because clays are negatively charged, they are highly reactive with cations (positively charged ions) in soil. They adsorb and desorb cations or nutrients. Thus, the clay-sized fraction is predominately responsible for the cation exchange capacity (CEC) and water holding capacity (WHC) of soil. Clays have 10 to 100 times greater CEC, depending

upon the clay mineral, than do sands and silts, and twice the WHC.

Plant growth on Day 3 required the presence of clays for storage of water and nutrients to be available for plant growth (Carroll, 1959; Ankus, 2019). As a result of weathering into dissolved chemicals, and then reforming into secondary clay particles, clays take longer to form from bedrock than do sand and silt particles. The research by Price et al. (2005) at Coweeta watershed led to the conclusion that it takes "tens of thousands to hundreds of thousands of years" to form clay assemblages. Yet, for soil on Day 3 to be productive, as described in Gen. 1, an appreciable abundance of clay in the soils is required. Thus, on Day 3 God created the land with the appearance of age.

### Second inconsistency

The second apparent inconsistency is that soils include "organic matter." This does not require that the decomposition of plant and animal material had to have already occurred on Day 3 to produce organic matter. Instead, it implies, even requires, that soil microorganisms (that is bacteria, actinomycetes, fungi, algae, protozoa, and viruses) were created on Day 3.

Soil can exist and even be somewhat productive without decomposed plant and animal material, but not without microorganisms. "Soil isn't an inert growing medium, but rather is teaming with billions of bacteria, fungi, and other microbes" (USDA/NRCS, 2019). The top six inches of "good soil" (healthy) contains over 2,500 pounds of organisms such as microorganisms, nematodes, earthworms, ants, mites, etc. per acre. Expressed another way, one teaspoon of healthy soil contains as many as 1 billion bacteria alone (Johns, 2017), not to mention the many other organisms.

Soil microorganisms are responsible for decomposition, sequestering carbon and nitrogen, transforming nutrients such that they are available for plant uptake, fixing nitrogen from the atmosphere, soil structural development (aggregation), soil aeration, and many other critical functions that enable soil to produce the plant life described on Day 3. The importance of microorganisms to plant growth has been recognized for decades, as evidenced by the practice since the 1950s of inoculating seed with bacterial cultures (Jacoby et al. 2017).

Only recently has the dependence of plant growth on microorganisms been recognized; advances are being made in assembling synthetic microbial communities to

manipulate favorable microbial functions for enhancing plant growth (Jacoby et al., 2017). Much research is being conducted on plant growth-promoting bacteria and their role in producing hormones that regulate plant growth (Ortiz-Castro et al., 2008, 2009; Jacoby et al., 2017). While scriptures do not explicitly state when microbial life was created, microbial activity is required for soils to function; therefore, it is strongly implied that this occurred on Day 3.

### Summary

For plant life created on Day 3 to be productive as stated in Gen 1:11–13, the land is required to include secondary minerals (clays), which by today's rates and conditions take a long time to form. This demonstrates that on Day 3 God created the soil with the appearance of age.

It is now widely recognized that for the soil to be productive and fully functional, it was necessary that microbial life was also created on Day 3. So, as we teach our children the chronological order of the creation of life as explained in the Genesis account, we should include the creation of microbial life in the soil in addition to plant life on Day 3.

### References

- Ankush, J. 2019. Cation exchange: factors & importance. *Soil Management India!*. Retrieved April 15, 2019 from <http://www.soilmanagementindia.com/soil-properties/chemical-properties/cation-exchange-factors-importance-soil-science/15748>
- Carroll, D. 1959. Cation exchange in clays and other minerals. *Bull. Geol. Soc. Am.* 70:749–780.
- Jacoby, R., M. Peukert, A. Succurro, A. Koprivova, and S. Kopriva. 2017. The role of soil microorganisms in plant mineral nutrition—Current knowledge and future directions. *Front. Plant Sci.* 8:1617. <https://www.frontiersin.org/articles/10.3389/fpls.2017.01617/full>
- Johns, C. 2017. Living soils: The role of microorganisms in soil health. In *Strategic Analysis Paper. Future Directions International: Dalkeith WA 6009, Australia.*
- Ortiz-Castro, R., E. Valencia-Cantero, and J. Lopez-Bucio. 2008. Plant growth promotion by *Bacillus megaterium* involves cytokinin signaling. *Plant Signaling Behav.* 3-4:263–265.
- Ortiz-Castro, R., H. A. Contreras-Cornejo, L. Macias-Rodriguez, and J. Lopez-Bucio. 2009. The role of microbial signals in plant growth and development. *Plant Signaling Behav.* 4-8:701–712.
- Price, J.R., M.A. Velbel, and L.C. Patino. 2005. Rates and times scales of clay-mineral formation by weathering in saprolitic regoliths of the southern Appalachians from geochemical mass balance. *GSA Bull.* 117(5/6):783–794.
- USDA. 2017. Soil Survey Manual: Soil Science Di-



## Day 3 ...continued from page 3

vision Staff. C. Ditzler, K. Scheffe, and H.C. Monger (eds.). USDA Handbook 18. Government Printing Office, Washington, D.C.

USDA/NRCS. 2019. *Soil Health: Healthy Soil for Life*. Retrieved April 15, 2019 from

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>

Wilson, G. and J. Locke. 2018. Is dry land really dry? *Creation Matters* 23(6):1.



## Uniformitarianism ...continued from page 1

allure (e.g., Miall, 2015, cp. Reed, 2018). The logical inconsistencies are described in Reed (2010; 2011), and we will further explore some of the empirical inconsistencies here.

### Uniformitarianism challenged from the very beginning

After uniformitarianism was first hailed by early geologists, it was immediately challenged by the proposed Ice Age of Agassiz in 1840. Lyell initially rejected it:

Even Lyell, the most prominent geologist to stand outside this consensus, found it an unacceptably catastrophic deviation from the “uniformity” of an earth in a steady state or at least in an extremely slow or long-wave cyclicality. ... Soon after the famous discussions of the glacial theory at the Geological Society [of London], Lyell retracted his adherence to anything like Agassiz’s Ice Age, withdrew his paper from consideration for full publication in the Society’s *Transactions*, and reverted to his earlier iceberg or “drift” explanation for erratic blocks (Rudwick, 2008, p. 517, 536, quotes by author).

The Ice Age remained controversial for about thirty years, but research in many other parts of the world turned up abundant evidence of melted ice sheets. Scientists in North America realized that much of the northern part of their continent had been glaciated. It was not only contrary to uniformitarianism, but no one knew why these areas had been recently glaciated. Most geologists grudgingly accepted the Ice Age, and in a masterful understatement, Imbrie and Imbrie (1979, p. 41) explained why:

Why did this [glacial] theory, whose

validity now seems self-evident, encounter so much resistance 100 years ago? In part, the slow acceptance of the theory may be attributed to a natural resistance to new ideas—particularly if those ideas run counter to long-held scientific principles or to religious convictions. The Agassiz theory challenged both, *although religious conviction was probably less of a factor than scientific orthodoxy* [emphasis ours].

### Continued challenges to uniformitarianism

But the Ice Age was only the first major conflict. Like a python swallowing a pig, the next “problem” took most of the 20<sup>th</sup> century to be digested. The Lake Missoula flood occurred at the peak of the Ice Age. Evidence for it was first noticed in 1923 by J Harlan Bretz.<sup>1</sup> His discovery was rejected for 40 years by mainstream geologists (Oard, 2004, 2014). So massive a catastrophe smacked of the Genesis Flood (Alt, 2001, p. 17).

Ironically, only a few of the “open-minded empiricists” actually checked the field evidence in eastern Washington, northern Idaho, and western Montana, and they only “saw” slow processes over millions of years. Forty years later, aerial photos made the evidence impossible to ignore, and they grudgingly gave in. Their reticence gave uniformitarianism forty more years to be cemented into the public consciousness.

Lessons from this episode include: (1) uniformitarianism is a faith commitment, and (2) that faith in it trumped *data* for decades. It is an insight into the minds of secular opponents of biblical history... as well as an example of their hypocrisy. It also has shown that favored belief systems can be modified as needed; today, geolo-

<sup>1</sup> “J” without a period is his actual first name.



FIGURE 1. Herschel crater and other smaller craters on Saturn’s moon, Mimas (NASA).

gists strongly affirm uniformitarianism but allow limited, minor catastrophes.

A later conflict started the divergent school of neocatastrophism, which persists today. Increasing evidence was found of large asteroid impacts, particularly the Chicxulub impact that supposedly caused the end-Cretaceous extinction of the dinosaurs (Alvarez et al., 1980). After strongly endorsing a volcanic explanation for craters, both terrestrial and extraterrestrial (Figure 1), uniformitarians were forced to admit that impacts were real (Oard, 2012; Reimold, 2007).

In spite of these spectacular failures, uniformitarianism maintains its iron grip on the minds of secular scholars, and is the axiom behind almost all interpretations of the geological observations. Reed (2011; Reed and Williams, 2012) explained this by noting that uniformitarianism functions as a necessary and inviolate presupposition for secular natural history.

### Present processes cannot explain many rocks

In addition to evidence of past processes contradicting uniformitarianism, many “present-day” processes do, too. Take, for example, sandstones. Sand is composed of particles with diameters from 1/16 to 2.00 mm. Sandstone is cemented sand. The main cements are silica (SiO<sub>2</sub>) and calcite (CaCO<sub>3</sub>). Although estimates vary, sandstones make up about 20 to 25% of the sedimentary rocks (Boggs, 2012, p. 101). This definition of sandstone rests on a size definition of the particles.

Therefore, other classifications are required to describe the composition of the

particles. There are four main types: 1) quartz arenite, 2) arkose, 3) graywacke, and 4) lithic arenite. Quartz arenites are those sands that contain more than 95% quartz particles. Sands with 25% or more feldspar with a smaller percent of rock fragments are called arkose. Those sandstones that have a fine-grained matrix of about 15% are referred to as graywacke. If a sand has a fair percentage of rock fragments, generally 25% or less, with a lesser percentage of feldspar, it is termed a lithic arenite. This classification does not include the cement for binding the sand into a sandstone.

### *The shape puzzle*

One of most noticeable contradictions to uniformitarianism is found in the large-scale morphology of sandstones; most modern-day sands form linear bodies, such as rivers and beaches, while sandstones in the rock record are large sheets:

It is noteworthy that most common modern sites of sand accumulation—the beaches and rivers—are linear features and the sand associated with them is confined to narrow zones. Yet, the sands of the past commonly occur in areally extensive stratiform sheets (Pettijohn et al., 1987, p. 7).

### *Origin of quartz arenite a mystery*

Another conundrum for uniformitarianism is the volume of quartz arenites in the rock record. These rocks, composed of more than 95% quartz grains, make up about 33% of all sandstones (Pettijohn et al., 1987). The grains are mostly well rounded and frosted, and where they outcrop there are very few interbeds of shale. Frosting is the result of many small pits or other marks in the sand grain. The formation of quartz arenites is rare and local today:

They [quartz arenites] are exceptional in the sense that modern quartz arenites are absent in temperate and northern latitudes or if they exist at all, are small accumulations derived from or formed by redeposition of an older quartz arenite. ... However, sands with over 95 percent quartz have been reported from some tropical rivers including the Congo, Niger, San Francisco, and Parana ... (Pettijohn et al., 1987, p. 184).

However, in tropical rivers such as the Amazon River, the quartz grains are not rounded, unless eroded from a quartz arenite

(Franzinelli and Potter, 1983).

The paucity of quartz arenites today contrasts markedly with the rock record. Quartz arenite is sometimes found as thin, widespread sheets of sandstone, for example the Ordovician St. Peter Sandstone that outcrops over much of the middle USA, an area of 582,750 km<sup>2</sup> (Hoholick et al., 1984)! Other quartz arenite can be 1,000 m thick or more. For instance, the Proterozoic Roraima Formation in Venezuela is greater than 2,500 m thick and exists as erosional remnants in the form of high plateaus. The Cambrian/Ordovician Jura Quartzite, a metamorphosed quartz arenite, is 5,300 m thick (Soegaard and Eriksson, 1989)! A vast sheet of quartz arenite with a volume of 15 million km<sup>3</sup> was laid down in North Africa from the Atlantic coast to the Persian Gulf in Cambrian/Ordovician times from paleocurrents flowing north (Avidgad et al, 2005). Even Pettijohn et al. (1987, p. 509) were forced to conclude that quartz arenites violate the uniformitarian principle:

Another seeming ‘non-uniformitarian’ kind of sandstone is the extremely thick quartz arenite that seems to be widespread in the upper Precambrian. Quartzites [mostly metamorphosed quartz arenite] such as the Lorrain of Ontario, the Baraboo of Wisconsin, the Athabaska of Saskatchewan, and the Uinta of Utah are all very pure and well over 1000 m thick... (emphasis theirs, brackets mine).

### *The arkose problem*

Arkose, a sandstone with about 25% or more feldspar, forms no more than 15% of sandstones (Pettijohn et al., 1987). The majority of grains are quartz and are generally poorly rounded and cemented by calcite. Sands today can have a fair amount of feldspar, about 11% on the average (Potter, 1978). So, local arkose could be explained by uniformitarianism, having eroded from a provenance high in feldspar, such as granite and gneiss rocks that form the upper continental crust or are uplifted in mountainous regions.

Because feldspar weathers rapidly to clay and more easily disintegrates by transport, the erosion of a terrain high in feldspar and the deposition of the erosional products must have been rapid. Thus, arkose is only a local deposit today: “...the idea of arkoses being either local deposits related to block faulting or residual deposits above granitic basements is confirmed...” (Porter, 1978, p. 30).

However, the sedimentary rocks are much different. Thick, widespread arkose sandstones occur in the rock record—another example of the much larger-scale layers produced in the past than today. For instance, the Old Red Sandstone that extends over the United Kingdom and Norway is an arkose containing up to 60% feldspar (Pettijohn et al., 1987). The large scale and the millions of years uniformitarianism give for the accumulation of thick arkose is called the “arkose problem” (Pettijohn et al., 1987, p. 155–156).

### *The graywacke problem*

Graywacke is a sandstone with a matrix of finer-grained silt and mud greater than 15%. It is essentially a “muddy” sandstone, and the quartz grains are generally angular. Graywacke is considered mostly marine, often interbedded with shale containing marine fossils. Graywacke forms about 22% of all sandstones and most are found in the Precambrian and Paleozoic (Pettijohn, 1975).

The problem with graywacke is the difficulty in explaining the matrix, in other words the mixture of silt and sand sized grains, because moving water tends to separate them (Berthault, 2002):

The problem became one of explaining the simultaneous deposition of mud and sand. Normally, as a result of current action, the two part company and are separately accumulated (Pettijohn et al., 1987, p. 172).

However, graywacke is common in the rock record, similar to quartz arenite and arkose. An example is the thick, widespread Franciscan Formation in the Coast Range of California. The Torlesse greywacke in New Zealand is believed to be 15 to 20 km thick (Dickinson, 1971)! So, the existence of graywacke, especially in the volume found in the rock record, has no modern terrestrial analog of significance. Once again, uniformitarianism fails in the field.

### *Lithic arenites*

Lithic arenites are sandstones composed of a substantial quantity of rock particles of sand size with little or no matrix. Of course, quartz is the dominant mineral. Lithic arenites compose most of the remaining types of sandstone, generally around 20 to 26% (Pettijohn et al., 1987, p. 163). Most modern sands, if lithified, would probably be considered lithic arenites, so the sand for this type of sandstone *is* forming today and

can be reconciled to the uniformitarian principle. The only glitch is the much larger scale of lithic arenites in the rock record than the sands deposited today.

## Summary

Uniformitarianism must be accepted by faith. After being formalized by Lyell, it has come under heavy assault by the Ice Age, the Lake Missoula flood, and impact craters. Moreover, present processes cannot explain many rocks. We examined sandstones in particular. When we examine the properties of each of the four main types of sandstones, we discover that three out of four violate uniformitarianism on a local scale. Only lithic arenites are forming today, but not on the scale observed in the rock record. If uniformitarianism cannot explain these common lithologies in the rock record, why should we trust it to explain the rest?

## References

- Alt, D. 2001. *Glacial Lake Missoula and its Humongous Floods*. Mountain Press Publishing Company, Missoula, MT.
- Alvarez, L.W., W. Alvarez, F. Asaro, and H.V. Michel. 1980. Extraterrestrial cause for the Cretaceous–Tertiary extinction. *Science*. 208(4448): 1095–1108.
- Avidgad, D., S. Sandler, K. Kolodner, R.J. Stern, M. McWilliams, N. Miller, and M. Beyth. 2005. Mass-production of Cambro-Ordovician quartz-rich sandstone as a consequence of chemical weathering of Pan-African terranes: environmental implications. *Earth Planet. Sci. Lett.* 240:818–826.
- Berthault, G., 2002. Analysis of main principles of stratigraphy on the basis of experimental data. *Lithology and Mineral Resources* 37(5):509–515, 2002.
- Boggs, Jr., S. 2012. *Principles of Sedimentology and Stratigraphy*, fifth edition. Prentice Hall, New York, NY.
- Dickinson, W.R. 1971. Detrital modes of New Zealand Greywackes, *Sediment. Geol.* 5:37–56.
- Franzinelli, E. and P.E. Potter. 1983. Petrology, chemistry, and texture of modern river sands, Amazon River system. *J. Geol.* 91:23–39.
- Hoholick, J.D., T. Metarko, and P.E. Potter. 1984. Regional variations of porosity and cement: St. Peter and Mount Simon Sandstones in Illinois Basin. *Am. Assoc. Pet. Geol. Bull.* 68:753–763.
- Hutton, M. 1998. *Theory of the Earth; or an Investigation of the Laws Observable in the Composition, Dissolution, and Restoration of Land upon the Globe*, 1788. Reprinted by Kessinger Publishing, Whitefish, MT.
- Imbrie, J and K.P. Imbrie. 1979. *Ice Ages: Solving the Mystery*. Enslow Publishers, Short Hills, NJ.
- Lyell, C. 1990. *Principles of Geology*, Volume I, 1830. Reprinted by The University of Chicago Press, Chicago, IL.
- Lyell, C. 1991a. *Principles of Geology*, Volume II, 1832. Reprinted by The University of Chicago Press, Chicago, IL.
- Lyell, C. 1991b. *Principles of Geology*, Volume III, 1833. Reprinted by The University of Chicago Press, Chicago, IL.
- Miall, A.D. 2015. A new uniformitarianism: stratigraphy as just a set of “frozen accidents.” In D.G. Smith, R.J. Bailey, P.M. Burgess, and A.J. Frasier, (Eds.). *Strata and Time: Probing the Gaps in our Understanding*, Special Publication 404, Geological Society, London, pp. 11–36.
- Oard, M.J. 2004. *The Missoula Flood Controversy and the Genesis Flood*. Creation Research Society Books, Chino Valley, AZ.
- Oard, M.J. 2014. *The Great Missoula Flood: Modern Day Evidence for the Worldwide Flood*. Awesome Science Media, Canby, OR.
- Pettijohn, F.J. 1975. *Sedimentary Rocks*, third edition. Harper and Row, New York, NY.
- Pettijohn, F.J., P.E. Potter, and R. Siever. 1987. *Sand and Sandstone*, second edition. Springer-Verlag, New York, NY.
- Potter, P.E. 1978. Petrology and chemistry of modern big river sands. *J. Geol.* 86:423–449.
- Reimold, W.U. 2007. Revolutions in the earth sciences: continental drift, impacts and other catastrophes. *S. Afr. J. Geol.* 110:1–46.
- Reed, J.K. 2010. Untangling uniformitarianism, Level I: A quest for clarity. *Answers Res. J.* 3:37–59.
- Reed, J.K. 2011. Untangling uniformitarianism, Level II: Actualism in crisis. *Answers Res. J.* 4:203–215.
- Reed, J.K. 2018. Changing paradigms in stratigraphy—another new uniformitarianism? *J. Creation* 32(3):64–73.
- Reed, J.K. and E.L. Williams. 2012. Battlegrounds of natural history, part II: actualism. *Creation Res. Soc. Quart.* 49(2):135–152.
- Reed, J.K. 2018. Changing paradigms in stratigraphy—another new uniformitarianism? *J. Creation* 32(3):64–73.
- Rudwick, M.J.S. 2008. *Worlds before Adam: The Reconstruction of Geohistory in the Age of Reform*. The University of Chicago Press, Chicago, IL.
- Soegaard, K. and K.A. Eriksson. 1989. Origin of thick, first-cycle quartz arenite successions: evidence from the 1.7Ga Ortega Group, northern New Mexico. *Precambrian Res.* 43:129–141.



**URGENT  
RENEWAL  
INFORMATION**

Many of you who attempted to renew your memberships ahead of schedule in April or May were unable to do so because of a software “glitch.” You were, in effect, shut out of the renewal option until your memberships actually expired. Unfortunately, this problem was not detected in time by the company we had hired to re-build our website.

The issue has been corrected. However, we are aware that many of you were unable to complete your renewals at that time.

**PLEASE go to [CreationResearch.org](http://CreationResearch.org) and try again to process your renewal.**

Thank you for your patience, understanding, and support!

Please call our office at 928-636-1135 if you have questions about this procedure.



# Matters of Fact

by

Jean K. Lightner, DVM, MS

## Adaptation in Sticklebacks

*Editor's note: You may submit your question to Dr. Jean Lightner at [jean@creationresearch.org](mailto:jean@creationresearch.org). It will not be possible to provide an answer for each question, but she will choose those which have a broad appeal and lend themselves to relatively short answers.*

### Q Do stickleback fish provide evidence for evolution?

A That depends on which definition you are using for “evolution.”

Threespine sticklebacks (*Gasterosteus aculeatus*) that live in freshwater environments today are reasonably inferred to have descended from marine populations of the same species. Investigations comparing freshwater adapted populations with their marine counterparts provide excellent evidence that God designed these fish with the ability to change and adapt to their environment. There is no evidence, however, that these fish are evolving into something fundamentally different. A relatively recent review paper highlights much of what we have already learned about the genetics underlying the phenotypic changes (Peichel and Marques, 2017).

### Big change, or many small ones?

At one time there was an intense theoretical debate among evolutionists over which is more important in adaptation: single mutations of large effect, or many mutations of small effect. Evolutionary biologist H. Allen Orr suggested that both may be important, and research in sticklebacks seems to support this. Researchers have been able to identify regions on chromosomes where differences in the DNA sequence are correlated with the trait of interest (e.g., body shape or skeletal traits).

These regions are known as quantitative trait loci (QTL). A number of different traits have now been studied, and a few QTL of large effect, and many more of small effect, were found to be involved. Further, the QTL for a particular trait were often clustered on the same chromosome(s), suggesting that linkage and/or pleiotropy may facilitate the phenotypic change (Peichel and Marques, 2017).

These results point to design on two levels. First, the fact that these traits can change in ways that allow for adaptation



The three-spined stickleback (*Gasterosteus aculeatus*).

### Obvious design

One example of adaptation by a large-effect mutation in sticklebacks is well studied and particularly interesting: the loss of pelvic spines. Pelvic spines are an advantage in a marine environment where there are large predatory fishes. Freshwater populations often lack pelvic spines, which appears to be advantageous in a lake environment, where grasping insect predators can use them to catch the fish. In most of the freshwater populations studied, the loss of spines was found to be the result of a large deletion in a regulatory region (*pel*) of the *pitx1* gene.

The *pel* (pelvic enhancer) regulatory region is tissue specific, controlling expression for the pelvic region. This allows for *pitx* expression in other regions where it is needed, even after *pel* has been disabled. While the effect was the same, the specific portion deleted in *pel* was slightly different in different populations, indicating that each arose by a different deletion event (Chan et al., 2010).

Even more interesting is the fact that *pel* has stretches of thymine-guanine (TG) repeats that make the region unstable. The intact *pel* region present in marine sticklebacks was shown to form alternative DNA structures. This characteristic dramatically increases the rate of double-stranded breaks and deletions (Xie, et al, 2019).

Thus, marine sticklebacks carry in the *pel* region a sequence designed to be easily changed by deletion. The obvious question is: are there any environmental factors that function as a trigger for these deletion events? One would expect this, as marine sticklebacks consistently carry only functional *pel* alleles.

### Awe for the Creator

For those whose hearts and minds are not blinded by naturalistic thinking, the obvious design necessary for successful adaptation of sticklebacks in just this one trait, loss of pelvic spines in freshwater populations, is truly astounding. In order for this change to take place, there had to have been a separate regulatory region specific to only the pelvic region, or the *pitx* gene would not have been able to be expressed in other regions of the body where it is essential.

suggests forethought in the design of the organism; otherwise, genetic changes would be far more likely to destroy the organism. Second, the non-random arrangement on the chromosomes would not be expected by chance. Instead, it suggests a Creator that not only created the genes, but organized them on the chromosomes in a way designed to benefit the creature. However, a creationist might wonder if mutation, that is, a change in DNA sequence from the originally created version, is really involved.

### Created diversity, or mutation?

Since creationists recognize that God created creatures according to their kinds (Genesis 1), there is reason to believe that there was a limited amount of diversity within each of these kinds at creation. Thus, an interesting theoretic debate exists among creationists regarding genetic (as opposed to physiologic) adaptation: is adaptation to specific habitats primarily the result of created alleles (i.e., versions of a gene) that have increased or decreased in populations according to how well they are suited to that environment, or is adaptation more commonly the result of genetic changes that occurred later in history?

Historically, creationists commonly argued that adaptation is usually the result of natural selection acting on created diversity. However, the examples given were hypothetical, and have not always been supported by subsequent research (e.g., hair length in dogs; Lightner, 2009). There are numerous examples where new alleles have arisen by mutation (i.e., a change in DNA sequence) and may be adaptive. Several examples were reviewed in this column in more detail several years ago. In each case they were the result of large-effect mutations (Lightner, 2016). However, it may not really be an either/or question. It is quite possible that both created diversity and mutation are important in adaptation.

This separate regulatory region had to be designed to undergo change, and the repetitive sequences it contains have equipped it to do so. Yet interestingly, it does not seem to do so in marine environments. Why not, since the mutation is recessive, meaning that pelvic spines develop in fish carrying a mutation in only one of their two *pel* alleles? Further scientific research is likely to reveal even more awe-inspiring components of this incredible adaptation.

Praise the LORD, all his works everywhere in his dominion.  
Praise the LORD, O my soul.  
*Psalm 103:22 NIV*

## References

- Chan, Y.F., M.E. Marks, F.C. Jones, G. Villarreal, M.D. Shapiro, et al. 2010. Adaptive evolution of pelvic reduction in sticklebacks by recurrent deletion of a *Pitx* enhancer. *Science* 327:302–305.
- Lightner, J.K. 2009. Hairy new findings in dog variation: a different coat is as simple as one, two, three. *Answers in Depth*. Retrieved May 14, 2019. from <https://answersingenesis.org/genetics/animal-genetics/hairy-new-findings-in-dog-variation/>
- Lightner, J.K. 2016. Created versus mutated: how do we know? *Creation Matters* 21(3):7–8.
- Peichel, C.L. and D.A. Marques. 2017. The genetic and molecular architecture of phenotypic diversity in sticklebacks. *Philos. Trans. R. Soc. B* 372:20150486.

Xie, K.T., G. Wang, A.C. Thompson, J.I. Wucherpennig, T.E. Reimchen, et al. 2019. DNA fragility in the parallel evolution of pelvic reduction in stickleback fish. *Science* 363:81–84.

# Renew now!

## Speaking of Science

### from the Creation-Evolution Headlines

by David F. Coppedge

*Editor's note: These S.O.S. (Speaking of Science) items have been selected from "Creation-Evolution Headlines" by David F. Coppedge at <http://crev.info> and are used by permission. Unless otherwise noted, emphasis is added in all quotes. Content may be edited for style and length.*

### Superlative New Hubble Deep Field Shouts "Awe"

How many galaxies can you fit in a piece of sky the diameter of the full moon? Keep reading.

The Hubble Telescope team has been busy. For years, they have been collecting photons of light from a small area of sky, the apparent diameter of the full moon. On May 2, they released their latest mind-boggler. The Hubble team tells the history that led up to their biggest deep field yet:

The Hubble Legacy Field combines observations taken by several Hubble deep-field surveys.

- In 1995, the Hubble Deep Field captured several thousand previously unseen galaxies.
- The subsequent Hubble Ultra Deep Field from 2004 revealed nearly 10,000 galaxies in a single image.
- The 2012 Hubble eXtreme Deep Field, or XDF, was assembled by combining ten years of NASA/ESA Hubble Space Telescope observations taken of a patch of sky within the original Hubble Ultra Deep Field.

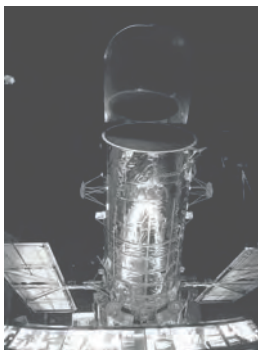
The new set of Hubble images, created from nearly 7,500 individual exposures, is the first in a series of Hubble Legacy Field images. The image comprises the collective work of 31 Hubble programs by different teams of astronomers. Hubble has spent more time on this small area than on any other region of the sky, totaling more than 250 days. The team is working on a second set of images, totaling more than 5,200 Hubble exposures.

And so here as the answer to "How many galaxies can you fit

in a piece of sky the diameter of the full moon?" Incredibly, the team believes they can see 265,000 galaxies, according to Space.com.<sup>1</sup> The new Hubble Legacy Field will probably hold a record for years to come. But one never knows; there are still many, many more galaxies to see out there.

Bored? Need some awe in your life? Meditate on these images for a while and think about Psalm 8 and Psalm 19. Then think about the Creator of all this stooping to become a man, and living with and teaching his creatures. Then ponder what they did to Him. Then think about His triumph over death and sin. Then think of His free gift of eternal life to all who believe. Then think about heaven. **Nobody should ever be bored again!**

1. Mathewson, S. (2019, May 24). This epic Hubble Telescope mosaic is a cosmic 'history book' of galaxies. *Space.com*. Retrieved May 24, 2019 from <https://www.space.com/hubble-telescope-photo-galactic-history-book.html>



"Hubble Space Telescope" licensed under CC BY-NC 2.0

### Natural Selection: Darwin's All-Purpose Magic Wand

If it exists, it evolved. How? By natural selection. How does that work? It makes things evolve. That's all you need to know.

Darwin's "Stuff Happens Law" (natural selection) persists in the media. Why? It has to; Darwinists and their willing accomplices in the media and academia have outlawed every other explanation, including logic. (Note: If logic evolved, it isn't logical.)

**Island lizards are expert sunbathers, and researchers find it's slowing their evolution.**<sup>1</sup> Evolution is fast, except when it is slow. Don't sunbathe too much, or your evolution might slow down, too. And you know what they say; evolve or perish.

**Is one toe really better than three? How horse's legs evolved for travel rather than speed.**<sup>2</sup> Evolution evolved five digits, except when it evolved three or one. Horses evolved to be fast, except when they evolved to travel distances. Humans can outrun horses in endurance running, but they have evolved to have five toes, not one. So you see, evolution explains everything.

**Evolution from water to land led to better parenting.**<sup>3</sup> "The evolution of aquatic creatures to start living on land made them



into more attentive parents, says new research on frogs led by the Milner Centre for Evolution at the University of Bath.” Fish must be terrible parents. Whales, too, because they evolved to go back into the water. But what does “better” mean to an evolutionist? Nothing; whatever happens, it evolved.

***Bird Evolution: Convergence Fits the Bill.***<sup>4</sup> Daniel J. Field explains, “disparate bill shapes evolved repeatedly throughout bird evolutionary history.” Of course they did. In “evolutionary history,” stuff happens, right? If it’s not divergent Stuff Happens, it might be convergent Stuff Happens. They’re as different as Tweedle-Dee and Tweedle-Dumb.

1. Virginia Tech. (2019, April 22). Island lizards are expert sunbathers, and researchers find it’s slowing their evolution. *Science Daily*. Retrieved May 24, 2019 from <https://www.sciencedaily.com/releases/2019/04/190422105000.htm>
2. Univ. of Bristol. (2019, April 17). Is one toe really better than three? How horse’ legs evolved for travel rather than speed. *Science Daily*. Retrieved May 24, 2019 from <https://www.sciencedaily.com/releases/2019/04/190417111429.htm>
3. Univ. of Bath. (2019, April 10). Evolution from water to land led to better parenting. *Science Daily*. Retrieved May 24, 2019 from <https://www.sciencedaily.com/releases/2019/04/190410141823.htm>
4. Field, D.J. (2019, February 18). Bird evolution: convergence fits the bill. *Current Biology*. Retrieved May 24, 2019 from [https://www.cell.com/current-biology/fulltext/S0960-9822\(19\)30020-X](https://www.cell.com/current-biology/fulltext/S0960-9822(19)30020-X)

## Humans Are Still Evolving, All Right

**H**umans are still evolving? “Yes, we’re still evolving.”<sup>1</sup> Believe it...the caption says so! Author Hurst says that evolution happens by natural selection, except when it doesn’t. He’s exhibit A, evolving into an expert, just-so storyteller.

**The natural selection of words**<sup>2</sup> Authors Turney and Mohammad should be nominated for the BAH! prize, having written the most absurd, self-refuting hypothesis in recent memory. If words evolve by “natural” selection, does this imply selfish memes rule language? If so, the humans don’t mean anything they say. Words are using them to pass on their memes. Cue sound of implosion.

These are scientists and reporters on acid. Dennett said that Darwinism is a universal acid. It eats away the brains of its disciples, turning them into storytellers in fantasyland. Lock them up before they cause any more harm.

1. Hurst, L.D. [*The Conversation*] (2018, November 14). Human evolution is still happening – possibly faster than ever. *Phys.org*. Retrieved May 25, 2019 from <https://phys.org/news/2018-11-human-evolution-possibly-faster.html>
2. Turney, P.D. and S.M. Mohammad. (2019, January 28). The natural selection of words: Finding the features of fitness. *PLoS ONE* 14(1): e0211512. Retrieved May 25, 2019 from <https://doi.org/10.1371/journal.pone.0211512>

## Inserting Darwin Where He Doesn’t Belong

“**C**huck-in-the-Box” keeps popping up in scientific literature having nothing to do with his theory.

**[Note to reader:** ‘Darwin’ is being used here as a symbol or icon to represent his fundamental view about biology: specifically, his

belief that all life diversified from microbes to man by a series of mistakes without any guidance or purpose. His current disciples may dispute some aspects of Darwin’s theory, but all continue to agree on that point. Many of them openly admire Darwin and use his terminology of ‘natural selection’ to explain everything.]

As you peruse the following news items, ask yourself what on earth they have to do with Darwinian evolution. The observations neither require nor support evolution, and sometimes contradict it. Yet the authors crank their Chuck-in-the-Box toys anyway, and the Joker pops up, scaring the children and distracting the reader. Perceptive analysts may rightly ask, ‘What is Darwin doing here?’

According to Behe, “The relationship between Darwinism and real science is parasitic. The theory’s main use is for Darwinists to claim credit for whatever biology discovers. If research shows that humans are selfish, Darwinism can explain that. If science shows we are unselfish, why, it can explain that too. If we are a combination of both — no problem. If cells are simple or complex, if sexual reproduction is common or rare, if embryos are similar or different, Darwinism will explain it all for you.”<sup>1</sup>

Here are some recent examples in the news.

**Bedbugs slept (and evolved with) T. Rex**<sup>2</sup> In this article with video, Mike Siva-Jothy announces that the old story of bedbug evolution was off by 100%. His team estimates that bedbugs ‘evolved’ 100 million years ago, twice the age of the bats evolutionists used to think were their hosts. This means bedbugs must have preyed on dinosaurs like *T. rex*, which they admit seems ‘unlikely.’ Do the early bedbugs look primitive?

No; they were already specialized for feeding on individual hosts, and look just like modern bedbugs. The paper in research paper<sup>3</sup> gives no indication that they evolved from imaginary pre-bedbugs. Siva-Jothy admits,

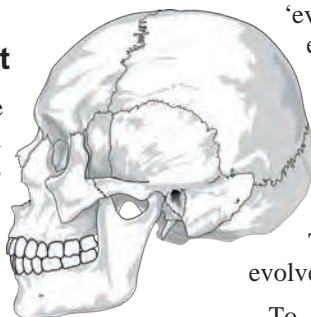
To think that the pests that live in our beds today evolved more than 100 million years ago and were walking the earth side by side with dinosaurs, was a revelation. It shows that the evolutionary history of bed bugs is far more complex than we previously thought.

But they didn’t evolve! They were bedbugs; they are bedbugs. The evolutionary story is now more ‘complex’ and incredible than it was before. Where is any repentance for having misled the public all this time?

**Hear ye, hear ye: Dolphin’s ancestor’s hearing was more like that of hoofed mammals.**<sup>4</sup> Underneath the pompous headline, we learn that echolocating dolphins have fewer spiral turns in their inner ear cochlea than do some land mammals. That’s it. CT scanning of fossil bones is fine, but even if one were to grant the tale that toothed whales (including dolphins) evolved from hoofed mammals by chance, the evidence shows devolution – not evolution – of the cochlea. Plus, it says absolutely nothing about how the irreducibly complex phenomenon of echolocation originated. What’s Darwin got to do with it?

Dolphin echolocation is a highly-complex, integrated system of many matched parts with extremely precise performance. It is beyond the reach of chance or gradual, stepwise natural selection, because if any component were missing, it would not work.

Because echolocation is useful for navigating dark waters, natural selection likely came into play with its development



in the branch that survived, one of the researchers said.<sup>5</sup>

“It’s useful, therefore it evolved.” That’s absurd. They’re using their *assumption* of evolution as *evidence* of evolution. This is the kind of parasitic Darwinism that Behe complained about, taking credit for anything and everything after the fact. Moreover, the paper appeals “convergence” in order to save Darwinism from falsification, illustrating Behe’s quip that Darwinism is so elastic it would make Sigmund Freud blush. With this in mind, watch the short video clip in the press release,<sup>4</sup> and groan over two brainwashed young biologists trained in Darwin-speak when the actual evidence opposes their belief.

1. Behe, M.J. 2019. *First Things*. Retrieved May 26, 2019 from <https://www.firstthings.com/article/2000/11/conservatives-darwin-design-an-exchange>
2. The University of Sheffield. (2019, May 16). Retrieved May 26, 2019 from <https://www.sheffield.ac.uk/news/nr/bedbugs-parasites-evolved-millions-years-dinosaurs-trex-1.843890>
3. Roth, S., O. Balvin, M.T. Siva-Jothy, et al. (2019, May 16). Bedbugs evolved before their bat hosts and did not co-speciate with ancient humans. *Current Biology*. Retrieved May 26, 2019 from [https://www.cell.com/current-biology/fulltext/S0960-9822\(19\)30477-4](https://www.cell.com/current-biology/fulltext/S0960-9822(19)30477-4)
4. Hall, H. (2019, May 15). Dolphin ancestor’s hearing was more like hoofed mammals than today’s sea creatures. *Research News@Vanderbilt*. Retrieved May 27, 2019 from <https://news.vanderbilt.edu/2019/05/15/dolphin-ancestors-hearing-was-more-like-hoofed-mammals-than-todays-sea-creatures/>
5. Racicot, R.A., R.W. Boessenecker, S.A. F. Darroch, and J.H. Geisler. (2019, May 15). Evidence for convergent evolution of ultrasonic hearing in toothed whales (Cetacea: Odontoceti). *The Royal Society Journal Biology Letters*. Retrieved May 27, 2019 from <https://royalsocietypublishing.org/doi/10.1098/rsbl.2019.0083>

## Designed Selection Is Not Evolution

When you insert mindful choice or programmed choice into a process, Darwinism disappears. The following articles repeat a common mistake: confusing artificial selection with natural selection. Natural selection is a contradiction in terms. Who is the selector?

**High performance evolution?**<sup>1</sup> The article begins by recognizing design:

Materials by design: Argonne researchers use genetic algorithms for better superconductors.

So what’s evolution got to do with it? The article creates a hopeless muddle like mixing oil and water:

Owners of thoroughbred stallions carefully breed prize winning horses over generations to eke out fractions of a second in million-dollar races. Materials scientists have taken a page from that playbook, turning to the power of evolution and artificial selection to develop superconductors that can transmit electric current as efficiently as possible.

What Argonne National Laboratory is doing has nothing to do with evolution. At every point, the researchers are the selectors. They “need to be selective” to get defect-free materials, they say. This is not evolution; it is biomimicry — the imitation of design in nature.

**Programming the forces of evolution.**<sup>2</sup> Under a big photo of Darwin, this group similarly confuses designed selection with Darwin’s error. The confusion starts in the first sentence:

The genius of evolution is rarely seen in action, so the **invisible hand guiding the direction of biological systems** is often taken for granted. However, by applying

the principles of natural selection to research questions and designing robots to carry out these tasks, scientists are creating the world’s first evolutionary machines.

It would be hard to design a more equivocal, confused, and misleading statement than that. Evolution is no genius. It is dumb! It is mindless. Such are the big lies and half-truths utilized by Darwin propagandists today in the media.

**Darwin can help your doctor.**<sup>3</sup> If you want to live healthy, kick that Darwinist out of your doctor’s office fast! History used Darwin’s ideas to murder and kill millions of people in the name of “survival of the fittest.” Darwinism treats human beings as a population no differently than a culture of bacteria in a petri dish. Here’s how to dress up an ugly idea and make it look fashionable:

Taking an evolutionary view can inspire new ideas in clinical microbiology. For example, evolutionary studies can reveal why some antimicrobial dosing regimens are better than others in preventing the development of drug resistance. Looking at microbial communities, rather than just the pathogenic micro-organisms, can also lead to new insights. That is why clinicians, bioinformaticians analysing pathogens, and evolutionary biologists should all work together.

The evolutionary biologist, like a wolf in wolf’s clothing (yes, that’s what we mean), snickers as he openly weasels his way into the group committed to the principle, “Do no harm.”

1. Argonne National Laboratory. (2019, May 24). AI and high-performance computing extend evolution to superconductors. *ScienceDaily*. Retrieved June 4, 2019 from <https://www.sciencedaily.com/releases/2019/05/190524130229.htm>
2. Van Pandon, B. (2019, May 23). Programming the forces of evolution. *Phys.org*. Retrieved June 4, 2019 from <https://phys.org/news/2019-05-evolution.html>.
3. Science LinX. (2019, April 30). Darwin can help your doctor. *Science LinX News*. Retrieved June 4, 2019 from [https://www.rug.nl/sciencelinx/nieuws/2019/04/20190429\\_devos](https://www.rug.nl/sciencelinx/nieuws/2019/04/20190429_devos)



## CRS Board Service Awards

Mike Oard, 20 years

Jean Lightner, 10 years

Rob Carter, 5 years



# Letters

## "Selection" Article Is Timely

Jean Lightner's article, What is Meant by "Selection" (*Creation Matters*, Mar/Apr 2019), was a brilliant bombshell! Science requires and thrives on precise vocabulary to explain real world features and processes. Dr. Lightner demonstrates that "selection" is a term whose diverse and conflicting meanings leave it with no value to scientists, and its logic is only tautological "survival stories" devised to honor Darwin rather than either science or God.

Dr. Lightner's expose' is quite timely, and should help creation scientists develop the precise vocabulary necessary for scientific testing of ideas about both adaptation and the objective limits to variation within kind.

Like other young creationists, I once thought that using Darwinian terms and ideas would earn respect and even interest from evolutionary colleagues, but finally discovered they were merely amused that I naively thought I could use Darwinian assumptions, processes, and "flexible" terminology to reach a different conclusion.

In uncovering the "Babelsque" confusion surrounding "selection," perhaps Dr. Lightner pinpointed the concern about Darwinian thinking W.R. Thompson expressed in his Forward to the centenary edition of Darwin's Origin: "Thus are engendered those fragile towers of hypotheses based on hypotheses in which fact and fiction intermingle in inextricable confusion."

Dr. Gary E. Parker  
Creation Adventures Museum  
1220 W Imogene St.  
Arcadia, FL 34266

GM

## The CRS Board of Directors 56th Annual Meeting



### Attendees

**Back row:** Russell Humphreys, Robert Hill, Kevin Anderson,\* Jean Lightner, Diane Anderson\*, Rob Carter, Gene Chaffin

**Front Row:** Gary Locklair, Tim Clarey, Don DeYoung, Jerry Bergman, Mark Horstemeyer, Ron Samec, Mike Oard

**Not Shown:** John Reed, Glen Wolfrom, and Danny Faulkner

\*Diane and Kevin Anderson are employees of the Society. Kevin is Director of the Research Center.





## Creation Matters

May / June 2019  
Vol. 24 No. 3

### All by Design by Glen W. Wolfrom, PhD

# Bats Play “Good dop” ... “Bad dop”

**B**ats use echolocation to track prey (flying insects) even while flying in and out of dense foliage. But they have a difficult task—avoid crashing into obstacles (leaves, etc.) in their environment that also return Doppler echoes. So, how do bats separate the good echoes from the bad echoes (noise)?

Two distinct types of pinna (ear) movement were previously discovered in at least two bat species<sup>1</sup>(2017) by Virginia Tech researchers. At the time of the first report, their purpose was undetermined.

Now it has been learned that this unique biosonar behavior is utilized by these bats to perform a trick. They “move their ears fast enough so that sound waves impinging on the ears are transformed by the motion of the ear surfaces and shifted to higher or lower frequencies,” said one of the scientists involved. Specifically, they “tune in” to the good Doppler shifts that result from the wing-motion of their prey. These good shifts uniquely distinguish flying prey from

motionless objects. The Doppler shifts produced by the bat’s own wing movements were once thought to be primarily “a nuisance” for which the bat must compensate. It is now apparent that the bats use their own ear motion to purposefully add the good doppler shifts into their own pattern of signals.

*Night flight of a California leaf-nosed bat, Hipposideros armiger. (Bureau of Land Management)*



It is anticipated that the principles learned in this biological instance could have application, for example, in drones navigating in dense foliage or complex underwater structures—another case of biological mimicry.

### Bibliography

- Virginia Tech. (2019, June 3). Bats have an ambulance in their ears. *Virginia Tech Daily*. Retrieved June 10, 2019 from <https://vtnews.vt.edu/articles/2019/06/me-dopplershift.html>
- Xiaoyan, Y. and R. Müller. (2019, June 3). Fast moving bat ears create informative Doppler shifts. *PNAS* <https://doi.org/10.1073/pnas.1901120116>
- Xiaoyan, Y., P. Qui, L. Yang, and R. Müller. 2017. Horseshoe bats and Old World leaf-nosed bats have two discrete types of pinna motions. *J. Acoust. Soc. Am.* 141:3011. <https://doi.org/10.1121/1.4982042>
- Photo: Cal. Bureau of Land Management. flickr “mypubliclands.” Retrieved June 12, 2019 from <https://www.flickr.com/photos/mypubliclands/31167324927/in/album-72157699760909522/>

