

Creation Matters

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George McCready Price:

An Important Early Creationist

by Jerry Bergman, PhD



George McCready Price (1870-1963)

Although special creation and the global Flood have a long history in Christianity, a resurgence of biblical creation in the early 1900s largely began with the work of a Canadian, George McCready Price (1870–1963). Price, a primarily-self-taught geologist, authored 27 creationist and anti-evolution books, as well as hundreds of articles, mostly on geology. His views became common among creationists, particularly when the modern creation science movement was born in the 1960s.

His background

His education included three years (1891–1893) at what is now Andrews University, and another year at what is now New Brunswick University (Clark, 1966, p. 13). From 1907 to 1912, Price taught at what is now Loma Linda University, later at Pacific Union College, and at several other colleges, until he semi-retired in 1942 (Numbers, 2006, p. 465).

Evolution first became an issue for Price when he began teaching. A physician friend, who was a graduate of Harvard, in an attempt to convert Price to evolution

and atheism, loaned him several books on the subject. To the surprise of his friend, Price was not converted, but the books instead set him on a lifelong path of reading incessantly about evolution. At the same time, he took copious notes that he would later use in writing his 27 books (Clark, 1966, pp. 13–14).

From his fieldwork and detailed study of hundreds of scientific geological publications, Price concluded that the earth was far younger than geologists then claimed, and that geologists misinterpreted the evi-

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Matters of Fact

by Jean K. Lightner, DVM, MS

Editor's note: You may submit your question to Dr. Jean Lightner at 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 What do biologists mean by "selection"?

The word "selection" can be used in several ways by biologists. In most cases, it involves the observation of a change in traits or a pattern of characteristics that is not random and is, therefore, inferred to be the result of natural selection.

Natural selection

Natural selection is one way that the frequency of traits in a population can shift

What Is Meant by "Selection"?

over time. Essentially, those organisms with traits that are more advantageous should leave more offspring, while those with traits that are less well-suited to the environment will leave fewer offspring. Thus, in succeeding generations advantageous traits should become more common. In this way the population is said to adapt to its environment through natural selection.

Natural selection is often contrasted to genetic drift. Genetic drift is a random change in traits which is *not* correlated to better survival and reproduction in the current environment. For example, a gazelle may be eaten by a cheetah simply

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What's new in the "Q"?
See page 11.



Light Speed

One of the basic constants of nature is the speed of light in a vacuum. It was given the symbol “c” a century ago, perhaps because of its relation to the words “constant,” or *celeritas*, which is Latin for speed (Gibbs, 2004). The value can be expressed many ways, all of which are approximations:

- 0.98 feet/nanosecond
- Seven trips around the world in one second
- 186,282 miles/second
- 299,792,458 meters/second (About 3×10^8 m/sec)
- 5.8786×10^{12} miles/year (One light-year is about 6 trillion miles)

The speed of light (v) decreases to $v < c$ in materials as measured by their index of refraction (n), where $n = c/v$. Pure diamond has the value $n = 2.417$ and $v = 77,000$ miles/second. The light appears to slow because of interactions with the diamond’s carbon structure and may maintain its speed c when moving between the atoms.

The speed of light provides alternate ways to express approximate space distances outward from earth:

- Geosynchronous satellites: 0.5 light-seconds for a round trip from earth

- Moon: 1.3 light-seconds
- Sun: 8.3 light-minutes
- Mars: 4 to 24 minutes depending on the earth-Mars separation
- Big Dipper stars: 78 to 123 light-years

Radio waves travel at light speed, so when geosynchronous satellites are used for communication, a noticeable partial-second delay occurs. The longer time delay between earth and Mars places a significant communication constraint on future manned expeditions to the distant planet.

Light has many applications to creation studies. We will mention six, each meriting further discussion.

1. First, the wide spectrum of light stretches far beyond the visible colors, ranging from radio waves to gamma radiation. The variety of wavelengths displays God’s artistry and reveals the endless details of creation.
2. Secondly, light has a dual nature, having both wave and particle properties. In parallel behavior, particles such as electrons also possess a wave aspect, a characteristic that is utilized in electron microscopes.
3. Third, the gravity interaction between objects appears to travel at light speed, c . Meanwhile, in contrast to gravity, a mysterious interaction between particles called quantum entanglement, appears to be instantaneous and unlimited by light speed.
4. As a fourth application, light speed appears to be independent of the

source and observer. As an extreme example, you might be able to move fast enough to keep up with a speeding bullet. However, no matter how fast you travel, a light beam will still have the measured speed c relative to you.

5. Fifth, other than the quantum entanglement mystery, c appears to be the ultimate speed limit for the physical creation. As a proton approaches c in a particle accelerator, for example, its inertia and energy requirements both approach infinity. The passage of time also slows from the viewpoint of the particle as compared with a clock at rest. By the way, evidence is not convincing for a decaying light speed over time, a popular idea that was promoted several years ago.
6. Sixth, the challenge of how we can see distant starlight in a young universe continues to be researched. I personally prefer the viewpoint of a “mature Creation” with instantaneous starlight created in all its structural detail (DeYoung, 2010).

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Price

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dence. In 1906, Price offered \$1000 “to anyone who will, in the face of the facts here presented, show me how to prove that one kind of fossil is older than another” (Price, 1906, p. 9).

His evidence

Price wrote that his fieldwork, in areas such as eastern Canada and southern Colorado, gave him invaluable “firsthand knowledge of field geology” (Numbers, 2006, pp. 106–107). As an alternative explanation of orthodox geology, he proposed Flood Geology theory and reinterpreted the apparent order of the fossils that implied ancient eras (McIver, 1989, p. 178). After studying a wide variety of geologic literature, Price deduced that the

...facts of the rocks and fossils, stripped of mere theories, splendidly refute this evolutionary theory of the invariable order of the fossils, *which is the very backbone of the evolutionary doctrine* (Numbers 2006, p. 92, emphasis in original).

Price documented instances of strata containing young era fossils lying *below* strata containing very old era fossils, the opposite of what the long-age geologists expected. He also spent a summer in the Swiss Alps studying “upside down” strata (Price, 1954). Geologists who described these layers admitted,

...one would naturally suppose that a single formation was being dealt with, were it not for fossil evidence (Numbers 2006, p. 95–96).

In contrast to the geological interpretation of his day, Price concluded that the lack of evidence for erosion between the strata implied that very little time elapsed between the two separate rock layers.

Price also discovered examples in the literature of similar strata being found in reverse order, with old rocks on top and young ones in the lower strata. Today, orthodox geologists interpret such occurrences as overthrusts, which are caused by the pressure under and against the strata’s becoming so great that the strata were pushed upward (Clark, 1966, p. 25). Price’s interpretation was, “the geological record does not prove succession of ages, but rather shows a ‘taxonomic’ series representing different but contemporaneous zones of antediluvian life” (McIver, 1989, p. 44).

His influence

Price was a pioneer. Although some of his ideas were incorrect, he was nonetheless very influential in the conservative religious community. This was true partly because his writings prominently appeared in several conservative religious periodicals (Lindberg and Numbers, 1986, p. 400). One *Science* editor described him as “the principal scientific authority of the Fundamentalists” (Price, 1926, p. 259). He gave thousands of lectures on his research, mostly to students, influencing a whole generation of creationists (Lindberg and Numbers, 1986, p. 400).

Price understood that facts were always subject to interpretation. He was confident that “inductive geology” inferred a recent creation, but acknowledged that, in the end, the debate between creationism and naturalism lay outside of science, specifically, “across the boundary-line in the domain of philosophy and theology” (Numbers, 2006, p. 108).

As naturalists interpret facts “through the colored spectacles of Darwin and Lyell,” likewise creationists interpret the natural world from their own worldview (Numbers, 2006, pp. 107–108). Price added that the creation account of origins would never have been developed as a hypothesis from the Darwinian worldview. For geology, the choice was naturalistic uniformitarianism versus creationist catastrophism.

Price’s defense of creation science and criticism of evolution achieved wide exposure in 1925 when his arguments were used by William Jennings Bryan in the Scopes Trial. Bryan and Price had known each other for some time prior to this, so Bryan appealed to Price for help in preparing for the trial. Price advised Bryan to, if possible, avoid the science evidence during the trial because Price knew that, without someone who was very well versed in the creation worldview, the challenges presented by the Darwinists would be difficult to counter. He also observed that, rather than evolution, the evidence showed biological degeneration (Clark, 1966, p. 26). Price further argued that the fossil record, which he spent much time studying, showed clear evidence of rapid burial, such as that caused by a flood.

At that time, Price was indeed part of a minority. Many well-known creationists then, including William Jennings Bryan, Harry Rimmer, and even Baptist minister William Bell Riley supported a local flood and an old earth. Price also knew that the orthodox view in science taught that the

evolution of man and of all life occurred purely by natural processes (Schuchert, 1924, p. 487). Nonetheless, a handful of professors, including Harvard Professor of Zoology Howard Parker, acknowledged that Price had proposed a set of reasonable arguments (Clark, 1966, p. 29).

In the early 1960s, Henry Morris and John Whitcomb incorporated Price’s major ideas in their book, *The Genesis Flood*, a work that evolutionist Martin Gardner called “the most significant attack on evolution...since the Scopes trial” (Gardner, 1991, p. 94). Morris added that Price’s

...tremendous breadth of knowledge in science and Scripture, his careful logic, and his beautiful writing style made a profound impression on me when I first began studying these great themes, back in the early 1940s (Morris, 1993, p. 88).

Walter Lammerts, while a University of California-Berkeley student, came across a copy of Price’s *The New Geology*, in the University library. He was very impressed with Price, and frequently corresponded with him (Clark, 1966, pp.76–77). Lammerts was later involved in founding the *Creation Research Society*. As Gardner wrote, “almost every fundamentalist attack on evolution in the last three decades has drawn its major ammunition from” Price’s writings (Gardner, 1952, p. 127).

Clifford Burdick was also influenced, and personally mentored by Price, as was botanist Dr. George Howe, a leader in the Creation Research Society (Heyes, 1987, Howe, 1999). Others influenced by Price include biologists Dr. Frank Marsh and Dr. Harold Clark, who wrote the definitive biography on Price.

His critics

A total of 15,000 copies were sold of Price’s *The New Geology*. Within a few years of its release, it “was savagely attacked by scientific journals” (Clark, 1966, p. 46). Price’s critics were numerous. Only a few examples will be discussed to illustrate what he faced during most of his career.

David Starr Jordan, president of Stanford University, and a leading American expert on fossil fishes, concluded in a review of Price’s book, *Illogical Geology*, that Price should not expect “any geologist to take [his work] seriously” (Numbers, 1998, p. 101). This led to correspondence between Price and Jordan lasting over twenty years, in which Price once promised “to become an evolutionist” if “the foremost ichthyol-

ogist in the world,” i.e., Jordon, could prove by empirical science and the fossil record that fish evolved from some other more primitive animal (Numbers, 1998, p. 101).

Jordan claimed Price’s views were “based on scattering mistakes, omissions, and exceptions against general truths that anybody familiar with the facts in a general way cannot possibly dispute” (Numbers 2006, p. 106; Jordan, 1906). Jordan, although impressed with Price’s “obvious intelligence and lawyer-like mind” was unsuccessful in converting him to Darwinism (Numbers 2006, p. 106). A “tireless exponent of Darwin’s work...[Jordan] served as an expert witness on the validity of evolution at the Scopes trial in Tennessee” (Black, 2009, p. 35). During the trial, defense counsel Clarence Darrow sneered, “every scientist in this country knows [Price] is a mountebank and a pretender and not a geologist at all” (Court Trial, 1925, p. 297).

Yale geologist Charles Schuchert wrote that Price was “a fundamentalist harboring a geological nightmare,” and mocked Price’s rejection of “things that have long been accepted as fundamental” to geology (Schuchert, 1924, p. 487).

His vision

Price persisted in writing and speaking until he eventually achieved a modicum of success (Numbers, 2006, p. 94). His focus was

“to clear the old evolutionary structures from the ground” so that over time a new structure explaining the origin of life, built on solid fact, can replace it (Clark, 1966, p. 82). Even though Price’s views were not perfectly aligned with creation science as we know it today, it was this goal that helped to lay a solid foundation upon which scores of others have built since.

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[Editor’s note: Photo source, public domain: <http://www.creationism.org/books/price/PredicmtEvol/PredicmtAuthor.htm>]

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“Selection” ...continued from page 1

because it was unfortunate enough to be closer to the predator when the herd was attacked, and it happened to be the one the cheetah singled out to pursue. Perhaps this gazelle had an uncommon trait that was unrelated to its actual fitness in the environment. If that trait is now less common in the herd, it would be considered a random decrease, and the change would be attributed to genetic drift.

When only these two mechanisms are considered, natural selection is assumed to be the cause of an adaptive shift in traits, and genetic drift is assumed to be the cause of a random change. These mechanisms certainly occur in the world around us. However, there are other factors that need to be considered if one wants to reach realistic conclusions about adaptive changes in a population. For example, migration

and founder effect are often lumped under genetic drift because it is assumed that they are random with respect to fitness; but there are good reasons to doubt that this is always the case (Lightner, 2015a; Lightner and Ahlquist, 2017).

Thus, when an adaptive change in a population is observed, and it is called “selection” or even “natural selection,” it is not necessarily the result of natural selection. Often, it is just assumed because only traditional neo-Darwinian mechanisms are considered.

A non-random pattern

Non-random patterns may also be detected within the genome. When working with genomic data, “selection refers to any non-random, differential propagation of an allele as a consequence of its phenotypic effect” (Vitti et al., 2013, p. 98). The challenge is to distinguish actual examples of natural selection from other events that can produce a similar nonrandom pattern; e.g., demographic events such as migrations,

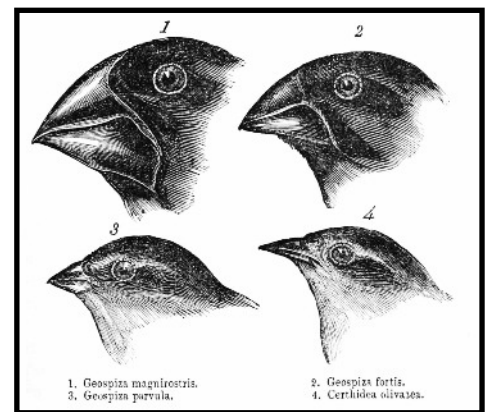


FIGURE 1. “Darwin’s finches.” Changes in beak size and shape can occur through natural selection, though if it occurs from unusually harsh weather conditions, it might not really be adaptive (see Lightner, 2015b). Hybridization, migration and various genetic factors may also contribute to adaptive changes in beak size and shape. [public domain: Darwin’s finches by Gould.jpg]

expansions, and bottlenecks (Vitti et al, 2013, p.112).

Mutations are assumed to happen randomly (Vitti et al, 2013, p.110). If muta-

tions are not random, especially with respect to fitness, then they become another confounding factor in identifying natural selection. Still another potential confounding factor at the molecular level is biased gene conversion (a form of meiotic drive, or non-Mendelian inheritance).

Currently, in keeping with naturalistic evolutionary assumptions, biased gene conversion (and other forms of meiotic drive) is assumed to be random with respect to fitness (i.e., it would contribute to genetic drift). However, if it is biased such that potentially adaptive alleles are more likely to be transmitted, then it will produce a non-random pattern like natural selection.

So, whether one is looking at an adaptive shift in traits in a population, or looking for evidence of natural selection in genomic data, the use of the word “selection” indicates that a non-random pattern has been observed. In practice, seldom is the pattern analyzed to such an extent that it is verified to be from natural selection.

An environmental exposure

Sometimes biologists speak of selection pressure, or applying selection. In this case there is an environmental condition, either naturally occurring or applied in the lab,

that is expected to affect different individuals in a population differently, depending on the traits they possess. For example, if an antibiotic is added to a culture medium containing bacteria, this would be applying selection, and only resistant bacteria would be expected to survive and reproduce. So, in this example, selection is describing the factor(s) that (may) cause natural selection to occur.

What is generally ignored is whether these environmental conditions might actually be inducing non-random, potentially adaptive mutations. Horizontal gene transfer may also be taking place. So, while natural selection can certainly occur when antibiotics are applied to a culture of bacteria, other significant factors may also be involved.

Ironically, though, if all the bacteria die from the antibiotic, natural selection has not occurred. Similarly, if all the bacteria are resistant and none die, natural selection has not occurred. Unless there is variability in a trait that affects survival and reproduction, natural selection cannot, by definition, occur in the population.

Conclusion

“Selection” is a term commonly used by

biologists, but its precise meaning can vary. The term is often applied when a non-random or adaptive change is detected. In this case, natural selection is one possible mechanism, but other factors can also produce this pattern. Selection can also refer to an environmental condition that may cause natural selection to occur. In any case, one should not automatically assume that natural selection has actually occurred when the word “selection” is used.

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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.

Amazing Preservation Fails to Shock Evolutionists

The first question ought to be, how can such things survive hundreds of thousands or millions of years? When the first dinosaur blood vessels, proteins, and skin cells were discovered, many creationists thought the fix was in for those holding to millions of years.

It turned out, though, that evolutionists are like the man who thought he was dead. His doctor asked if dead men bleed. He said, “No, dead men don’t bleed.” The doctor proceeded to poke him and red blood started coming out. The man responded, “Well, I’ll be. I guess dead men do bleed.”

Evolutionists used to state adamantly that proteins, cells, and DNA could not last for ten thousand

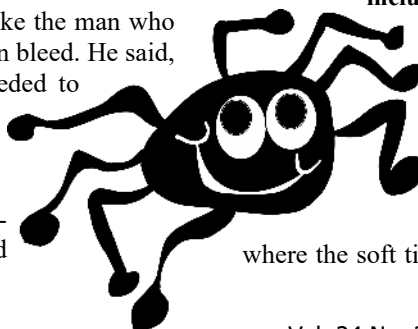
years, let alone a million. Any biological material would become permineralized and turn to stone in short order. But when soft tissues started turning up in fossils from the age of dinosaurs and earlier, they began saying, like the dead man, “Well, I’ll be. Soft tissue *can* last for tens and hundreds of millions of years.” Watch them do it right here.

Glowing Spider Eyes

A spider found in shale is claimed to be 100 million years old, and yet the back of its eyeballs still reflect light.¹ *Live Science* explains:²

Spider fossils are rare, the researchers wrote in a paper published online Jan. 28 in the *Journal of Systematic Paleontology*. **Their bodies are so soft that they typically decay entirely soon after death, leaving no trace unless they happen to end up trapped in amber. But 11 spiders from the Cretaceous period have turned up preserved in shale on the Korean Peninsula. And two of the fossils included the still-shiny traces of sparkling eyes.**

Glowing retinas are found in many organisms. What causes the phenomenon? Cells in the retina contain reflective layers called *tapetum lucidum*.³ In other words, the spider eyes still glow because remnants of cellular proteins are still working. And this was found not in amber, but in shale, a rock where the soft tissues of a spider should “decay entirely soon



after death.”

That’s not all. “[T]he rocks where the spiders were found **also contained the remnants of tiny fish and crustaceans.**”¹ Spiders do not typically live with fish and crustaceans, do they? Were the evolutionists ashamed to have said these rocks were 100 million years old? No; they were glad! Dead men do bleed.

“These spiders were doing things differently. ... **It’s nice to have exceptionally well-preserved features of internal anatomy like eye structure. It’s really not often you get something like that preserved in a fossil,**” Selden said in his statement.

Frozen Ecosystem

As Arctic ice retreats, a long-preserved landscape is becoming visible once again.⁴ Evolutionists claim the ecosystem has been under the ice for 120,000 years, including

...tiny Arctic plants and mosses were last alive when the ice enveloped the land. As the ice melts, Pendleton said, it exposes this **ancient, delicate vegetation. Wind and water destroy the long-lost plants within months,** but if researchers can get to them first, they can use radiocarbon dating to determine the age of the vegetation. .

Aren’t the researchers concerned that radiocarbon should all be gone by then? With a trick of storytelling, they stretch the timeline by 80,000 years:

They found that all of their samples were at least as old as the oldest age that radiocarbon dating can detect: 40,000 years. That’s a direct indication that the plants had been under ice for at least that long, the researchers reported.

In short, what they measured gives a 40,000 year radiocarbon age (not necessarily the true age, because of assumptions in the method), but the ice cap was three times older than that, they claim. And yet many of the “delicate plants” were found in “growth position,” they say. To believe they are that old, they have to believe that the ice never moved or melted before now, even though they admit that the ice has grown and shrunk over different time periods.

Keep poking the evolutionists and showing the blood. Maybe they will finally get the point that the evidence shows they are not physically dead, but just spiritually so.

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Darwin Debate Heats Up

The debate about Darwin vs. Design may be heating up again. Michael Behe’s new book *Darwin Devolves*,¹ coming out last month, has already gotten a trashing by three AAAS evolutionists, Lenski, Lents and Swamidass.² If *Science* would just print the responses to the review by Brian Miller,³ John West,⁴ and Behe himself at the Discovery Institute’s Center for Science and Culture, Darwin might be pleased. Pleased? Yes, because he himself said,

A fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question. [C. Darwin, *The Origin of Species* (1859), Introduction.]

The Darwinians claim that Behe has not responded to critiques by other evolutionists refuting his science. John West shows in his rebuttal that responding to critics is exactly what Behe has done, repeatedly. In fact, the evidence for his replies is so clear, and the claims of Lenski, et al. that he has not, are so blatantly false, that West accuses them of either sloppy research of the literature, or of outright fraud. It appears that the Darwinians and their enablers at the AAAS want to head Behe off at the pass by influencing readers of *Science* to ignore the book when it hits the press, or even, in hopes of awakening rabid Darwinian attack dogs in social media, to spread it far and wide.

By making a pre-emptive strike two weeks before Behe’s book came out, *Science* clearly has failed to fully state and balance the facts and arguments on both sides. If the past is a guide, they will certainly ignore any rebuttals submitted by Behe, even though he is a tenured biochemist at Lehigh University. But Dr Behe has made another run around the academic censors: he has published a 41-unit course on intelligent design and evolution.¹ Now anyone can hear him fully state and balance the facts and arguments on at least his side of this important question. In the process, viewers will also hear Behe give a fair hearing about what all the leading Darwinists say, from 1859 to the present. In his mild-mannered, matter-of-fact, non-threatening style, Dr Behe does what he is good at: teaching.

Behe’s section on Darwinism and neo-Darwinism is so non-sectarian, in fact, that watchers might think he agrees with it. In the next segment, “The Extended Evolutionary Synthesis and Beyond,” cracks start to appear. Behe mentions many leading Darwinians who are not satisfied with neo-Darwinian theory. This is all before Behe even discusses the science of intelligent design in any depth. If neo-Darwinism were the solid edifice it is made out to be in the press, where it is taken for granted as obvious, why would so many knowledgeable biologists be admitting its severe weaknesses and looking for alternatives?

The Discovery Institute announced another milestone that shows the debate may be heating up. Recently their “Dissent from Darwin” list surpassed 1,000 scientists who publicly agreed with this statement:⁵

We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged.

As David Klinghoffer explains, this number is most likely just the tip of the iceberg.⁶ Many in academia know that their careers are at stake if they were to express agreement with Behe

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Why Geology Matters

by

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

Editor's note: This series of articles emphasizes the unique role that geology plays in establishing a creation model of origins. Our goal is to encourage the study of geology, especially by those who are beginning their careers in creation science.

The Principle of Multiple Working Hypotheses

Truth is becoming an increasingly rare commodity. The West was built on the consensus that Christianity provided a foundation for truth and of truth in everything. The term “university” is derived from combining the terms “unity” and “diversity,” and is based on the idea that a unified truth underlaid the diversity of disciplines. So the decline of Christianity has not simply resulted in replacing its truth with another truth, as the early secularists envisioned, but with the corresponding unraveling of any truth.

Science is not immune to this trend and is seeing a decline in credibility. Strident demands that scientists be automatically accepted as authoritative fall on increasingly deaf ears. If there is no truth, how can scientists claim to have it?

History is full of examples of incorrect ideas, strongly affirmed at the time, but shown later to have not only been wrong, but to have caused physical, social, or psychological disasters. Though strongly affirmed by most scientists, evolution and deep time (the millions of years) have numerous obvious problems (Carter, 2015; Denton, 2016; Sanford, 2005) and have resulted in multiple deleterious effects on the culture and within Christianity (Bergman, 2014, 2017).

Only Christianity was able to generate science, and only Christianity can save it. One foundation it provides is the certainty that objective truth exists and can be discovered in the working of the natural world. Science per se does not guarantee truth; it is a method that rests on truth, testing ideas in such a way as to minimize human subjectivity and fallibility. The essence of this method has a biblical foundation:

But examine everything carefully; hold fast to that which is good. 1 Thessalonians 5:21 (NASB)

The basis of this principle is twofold: first, the careful examination or testing of



FIGURE 1. Illustrated proverb “The Blind Men and the Elephant” (Pawyi Lee, 2004. Wikimedia Commons, public domain).

ideas; and secondly, the implied ability to discard those that do not measure up. In science, that corresponds to the method of repeated, public, experimental examination. It requires a confidence that truth exists and that it can be found by this method. The most difficult part of this is the ability to suspend judgment while the method is working.

The principle

The idea of examining multiple sides of a theory, or multiple competing theories, was advocated by geologist Thomas Chamberlin (1843–1928) and became known as the principle of multiple working hypotheses. Chamberlin was the founder of *The Journal of Geology* and was its editor for many years. He encouraged this principle in a paper published in the journal *Science* in the late 1800s (Chamberlin, 1890), and in 1897 in *The Journal of Geology*.

The article has been reprinted many times in scientific journals, including as an historical essay in *The Journal of Geology* in 1995 (Chamberlin, 1995). It was controversial when first published, as it still is today (see below). Although a theory is a well-substantiated hypothesis, Chamberlin often used hypothesis and theory interchangeably.

Chamberlin concluded that because there are often many unknowns, science advances when we have several models or hypotheses instead of just one. It is too easy for one hypothesis or theory to dominate and suppress other ideas for subjective reasons. Chamberlin called a dominant or single hypothesis the “ruling hypothesis.” In this, he anticipated Thomas Kuhn (1962), who called such ideas “paradigms,” like super assumptions that researchers do not challenge, unless many anomalies accumulate. Chamberlin (1995, p. 354) especially thought geology needed multiple working hypotheses:

The studies of the geologist are peculiarly complex. It is rare that his problem is a simple unitary phenomenon explicable by a single simple cause. Even when it happens to be so in a given instance, or at a given stage of work, the subject is quite sure, if pursued broadly, to grade into some complication or undergo some transition. He must therefore ever be on the alert for mutations and for the insidious entrance of new factors. If therefore there are any advantages in any field in being armed with a full panoply of working hypotheses and in habitually employing them, it is doubtless the field of the geologist.

Chamberlin eschewed simple answers and realized that the entrance of a new variable (mutations to him, or new factors) can totally change the interpretation.

The danger of the ruling hypothesis

Chamberlin observed that a ruling hypothesis or dominant paradigm stifles other options, to the extent that researchers are tempted to force-fit their observations into the model, whether the data fit or not, usually by advocating additional hypotheses. One of the best-known examples of this is the use of ‘epicycles’ in the Ptolemaic geo-

centric theory of long ago to explain celestial motions that did not ‘fit.’ The Ptolemaic system lasted around 1,500 years, and during that time contradictions were fit to the model by adding more epicycles. Uniformitarianism would be another example, with its devotees not even able to define the term, nearly two centuries after it was coined (Reed, 2010; Reed and Oard, 2017). A more recent example would be global warming, where data are ignored, downplayed, or subordinated to computer models (Oard, 2011).

Chamberlin is very colorful in his description of the scientist who becomes over committed to his hypothesis. He says that every human tends to “fall in love” with his own hypothesis and has a tendency to become inflexible because of that commitment, even in the face of contrary evidence or defects in the theory:

The theory then rapidly rises to a position of control in the process of the mind and observation, induction and interpretation are guided by it. From an unduly favored child it readily grows to be a master and leads its author whithersoever it will (Chamberlin, 1995, p. 351).

Chamberlin (1995, p. 351) goes on to sum up the all-too-human tendency to latch onto our ideas as facts:

Briefly summed up, the evolution is this: a premature explanation passes first into a tentative theory, then into an adopted theory, and lastly into a ruling theory. When this last stage has been reached, unless the theory happens perchance to be the true one, all hope of the best results is gone.

Scientists must resist this tendency towards promoting their favorite hypothesis or theory in the face of many unknowns.

A ruling theory can retard progress by both wasting valuable research and excluding other ideas that might yield profitable research at an early stage. Pet theories do not necessarily help us understand complex and confusing phenomena. And, as noted earlier, studying geology as a forensic history only adds complexity, because the role of scientific testing is further reduced. Forensics is the gathering of clues in the present to determine a past event, like a detective or lawyer in the courtroom. It works the same way in interpreting geological observations.

However, no scientist has all the data; because of different backgrounds, they can come to different conclusions. Forensic ge-

ology can be like the parable of the blind men touching an elephant and trying to describe it from their distinct points of view (Figure 1). Each touches a certain part of the elephant and concludes that the elephant as a whole is like that part. When they compare notes, they find themselves in total disagreement. One man touching the trunk is sure the elephant is like a huge snake. Another grabs a leg and concludes the elephant is like a pillar.

Geological interpretations of the past are not as certain as many people would like them to be, especially when so much of geological interpretation *depends* upon one’s worldview. This is why Christians use the Bible as the ultimate reference book for the past, such as Genesis 6 to 9 for Noah’s Flood. If it is truly the inspired revelation of a Being who knows everything, and is incapable of lying, it is a source of certainty far beyond fallible human effort (Reed and Kleverberg, 2015).

Secular scientists do not follow Chamberlin’s principle

Because it cuts across the grain of man’s finite, fallible, and fallen nature, the principle of multiple working hypotheses has always been poorly applied. Some believe that it cannot be applied, that hardly any scientist has actually used it, and that it can be used to make a pretense of fairness or objectivity (Johnson, 1990). The method is unrealistic in that a scientist does not have time to investigate every possible hypothesis, especially in the “publish or perish” environment of modern academia.

It is also stifled by the pursuit of grants that marks today’s scientific practice. Although admitting that he quickly runs through all possible hypotheses, chooses an interpretation, and goes about testing that interpretation, Johnson claims that making the principle of multiple working hypotheses a formal method of science is an unrealistic expectation.

Johnson certainly has a point, but others write that Johnson misunderstood the principle, and that the principle may even be more valuable today (Spencer, 1997), especially when too many scientists actually assume their conclusions when applying for research grants (Railsback, 1990). The warning of the ruling hypothesis should be a caution to all scientists.

The principle is not even used today, despite lip service, but most people still believe that most scientists are open-minded toward other hypotheses (Locke, 1990). In

that sense, Chamberlin’s principle is similar to Popper’s falsification criterion, which stirs strong reactions from some (Blewett, 1993). It appears that all “scientific methods” have difficulties, not just Chamberlin’s principle:

Of all these bases, Chamberlin’s method of Multiple Working Hypotheses cannot be supported on purely logical grounds, but neither can any other “method” when viewed from the perspective of the logic of science. Most scientific investigations ignore such difficulties, and rarely, if ever, is a method of inquiry followed as spelled out in formal terms (Blewett, 1993, p. 257).

Much of the problem stems from the desire to make science the arbiter of all truth and its inability to carry that weight.

Spencer (1997) advocates use of multiple working hypotheses, arguing that researchers should take time to reflect on research and not rush to a conclusion. He examines several current violations of the principle that resulted in false ideas or the quick acceptance of paradigms. For instance, uniquely-shaped objects found in sedimentary rocks in southwest Washington state were hailed as coprolites with little detailed analysis, but upon further investigation are more likely natural objects.

In another example, Spencer (1997, p. 124) mentions the standard textbook representation of horse evolution and states that the sequence was established due to evolutionary bias: “The possibility exists that the data were assembled to conform to the then-prevailing Darwinian model of phyletic gradualism and orthogenesis.” He also gives the example of plate tectonics, which is too easily assumed starting right from a first course in geology:

Students come out of their first geology course spouting plate tectonics as if it is the gospel rather than the most current acceptable explanation of an observed phenomenon (Spencer, 1997, p. 128).

Creation scientists should follow the principle of multiple working hypotheses

Creation scientists must interpret a vast volume of earth-science observations within biblical earth history, recognizing the many unknown factors. These include the questionable conclusions and interpretations resting on uniformitarianism, and our lack of detailed knowledge of processes occurring during the Flood. In the face of these

unknowns, we should be those most open to the principle, especially regarding the physical mechanism of the Flood, the location of the Flood's lower and upper boundaries, the geological column, and other controversial aspects of Flood geology. Ruling theories can stifle research just as quickly in creationist circles as in uniformitarian ones.

A good example was the popularity of the vapor canopy theory, which creation scientists oversold. A thin vapor canopy could have existed, but we know very little about it (Oard and Reed, 2017). With more observations and greater understanding, creation scientists should be able to prune hypotheses, and the true hypothesis should show itself.

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Speaking of Science ...continued from page 6

or speak well of intelligent design. That a thousand are willing to come out publicly could signal the approach of a tipping point, when scientists feel safe to express their views in the open. When that day comes, Darwinism could collapse quickly, leaving many to wonder how it ever became such a dogma in the first place.

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The Best Science Imitates Nature

Biomimetics has everything science desires: inspiration, motivation, understanding, and application.

What's not to like about biomimetics? It's amazing. It's

interesting. Kids can like it. Parents can steer kids into careers in science with it. It's usually ethical and non-controversial. And we can all benefit from the discoveries that are leading to applied understanding that comes from figuring out nature's designs. Here are a few of the latest examples.

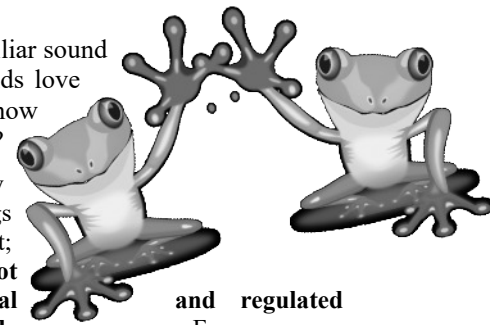
Frog-spiration

The chorus of frogs is a familiar sound on many a camping trip. Kids love to catch frogs, but do they know what scientists have learned?

If you've ever camped by a pond, you know frogs make a racket at night; but **what you might not know is how functional and regulated their choruses really are.** Frogs communicate with sound, and amid their ruckus is **an internally orchestrated system that lets information get through more clearly** while also permitting collective choruses and time to rest. Researchers from Osaka University and University of Tsukuba sought to leverage this amphibious acumen for mathematical and technological aims.¹

It seems impossible that a female could pick out a male's song from the din of croaks, but the collective regulation of sounds allows each frog to be heard, and also to take a rest. Inspired by their “amphibious acumen,” the scientists figured that network engineers could learn a thing or two.

“We found neighboring frogs avoided temporal overlap, which allows a clear path for individual voices to be heard,” study co-author Daichi Kominami explains. “In this same way, neighboring nodes in a sensor network need to alternate



the timings of data transmission so the data packets don't collide."

Robotic Muscle

The geniuses at MIT are bowing before a higher genius: the lowly spider.² The "unusual property of the ultrastrong material could be harnessed for twisting or pulling motions," they announced recently.

Spider silk, **already known as one of the strongest materials** for its weight, turns out to have **another unusual property that might lead to new kinds of artificial muscles or robotic actuators**, researchers have found.

The resilient fibers, the team discovered, **respond very strongly to changes in humidity**. Above a certain level of relative humidity in the air, they **suddenly contract and twist, exerting enough force** to potentially be competitive with other materials being explored as actuators — devices that move to perform some activity such as controlling a valve.

We all know about smart homes, smart lights, and smart grids. This newly-discovered property of spider silk might give us smart fabrics to wear. A civil engineering professor not involved with the work was impressed. Exemplifying the value of biomimetics in general, he responded,

What is particularly noteworthy about this work is that it **combines molecular modeling, experimental validation, and a deep understanding** by which elementary changes in chemical bonding scale up into the macroscopic phenomena. **This is very significant from a fundamental science point of view, and also exciting for applications.**

A Bioinspired Millirobot

A comparison of legs and feet of many animals reveals designs that allow creatures to live in almost any terrain on earth. Ask if the evolution reference in this amazing quote really helps the science, though:

Legs and/or feet are commonly found in many living animals, including both land animals (e.g., **ant, dog, cheetah**, etc.) and ocean animals (e.g., **starfish, octopus**, etc.), **after billions of years' evolution**. The legs could lift the animal's body from ground in demand manner, **leading to smaller body friction to ground, higher degrees of freedom in locomotion, less energy cost, and enhanced obstacle crossing ability**. **Thus, legged animals usually demonstrate great adaptability to complex terrain, and can probably access virtually 100% of earth's land surface.**³

Researchers Wing It

While this article claims it is "mimicking evolution,"⁴ the phrase is misleading. It's really about intelligent design. Even though the scientists randomly selected various wing shapes, they had a goal: the optimum wing. Darwinian evolution, by contrast, is unguided and aimless. It has no goal, and no scientist watching to pick out winners.

"We can **simulate biological evolution in the lab** by generating a population of wings of different shapes, have them compete **to achieve some desired objective**, in this case, speed, and then have the best wings 'breed' to make related shapes that do even better," says Leif Ristroph, an assistant professor at New York University's Courant Insti-

tute of Mathematical Sciences and the paper's senior author.

They call it 'survival of the fastest' but the wings did nothing. Intelligence humans designed the starting shapes, set the goals, directed the duplication, and selected the winners. This was design all the way. And where do you think they got inspiration to understand "flapping flight"?

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ERRATUM

World Views and Poor Scholarship

In the article titled "World Views and Poor Scholarship" published in *CM* 24(1), the sentence in the second full paragraph on page 7,

First, the denial of God's sovereignty was blunted by theological and philosophical trends of the 16th and early 17th centuries.

should instead have been,

First, mankind's view of God's sovereignty was blunted by theological and philosophical trends of the 16th and early 17th centuries.

We apologize for the error.

Quarterly Research Matters

Summaries* of Cutting-edge Research from the Creation Research Society Quarterly

Creation research that engages the current scientific literature and builds the creation model is crucial; CRS exists to support and publish such research. Only through high quality research can we equip others with strong, sound apologetics arguments that show the robustness of the creation model over that of evolution.

Continued creation research is made possible by the generous gifts (time, money, and prayers) of our many supporters.
Thanks to all who have contributed!

*Summaries compiled by J. Lightner.

Pondering Pediments

Appearing in the Summer 2018 issue of the *Creation Research Society Quarterly* is part II of Michael Oard's study on Genesis Flood drainage. In this article Oard focuses on pediments: broad, gently sloping rocky regions extending from the foot of mountains. He surveys pediments and planation surfaces in Southwest Montana, illustrating the discussion with numerous photographs. He then evaluates the three most popular uniformitarian explanations for pediments, and finds them all wanting.

Oard moves on to discuss a less popular secular view, Crickmay's "superflood" hypothesis. He reviews the evidence used to support this hypothesis, as well as the problems of postulating a superflood in a secular framework. Next, he discusses details of pediment patterns at three specific sites in Southwest Montana.

Based on the evidence, he argues that these features are best explained by the currents of the late Floodwaters. His research was supported by a grant from the CRS.

Oard, M.J. 2018. Genesis Flood drainage through Southwest Montana: Part II: The formation of pediments. *Creation Research Society Quarterly* 55:24-43.

Paradise Kingfishers and Building the Creation Model

The CRS eKINDS research initiative is focused on understanding created kinds, including their dispersal and diversification following the Flood of Noah's time. Previously, Dr. Jean Lightner had teamed up with Dr. Jon Ahlquist, an ornithologist with expertise in molecular phylogenetics, to explore the founder effect.

Lightner and Ahlquist (2017) provided information critical to understanding this phenomenon within a creationary model. The Summer 2018 issue of the *Creation Research Society Quarterly* features another eKINDS publication by these authors

Now, in a follow-up paper, Ahlquist and Lightner (2018) explore kingfishers in general, and paradise kingfishers more specifically. Multiple lines of evidence were examined which suggest that the family, Alcedinidae, comprises a created kind. Details of the paradise kingfishers are discussed in the context of Ernst Mayr's formulation of the founder effect.

Findings from recent studies using molecular data, are combined with biogeography to make some initial hypotheses regarding the migration and diversification within this bird family, after they exited the Ark and spread throughout the earth. Further

studies needed for this area of creation research are outlined.

Lightner, J.K., and J. Ahlquist. 2017. Founder events: Foundational in rapid post-Flood diversification. *Creation Research Society Quarterly* 53:217-224.
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All by Design

by Glen W. Wolfrom, PhD

Designated as a threatened or endangered species, the candy spider-orchid (*Caladenia versicolor*) is subject to research intended to preserve the species. It is currently found in limited numbers in only a couple of locations in Victoria, Australia.

Until recently, it was thought that these orchids were nectarless, attracting pollinators by being “food deceptive”; i.e., by only looking and smelling like they produced nectar.

Two new findings were revealed by recent research. First, it was found that *C. versicolor* does in fact produce secretions which, by GC-MS analysis, were shown to contain small quantities of sucrose (nectar).

Secondly, it was learned that the candy spider-lily is almost exclusively (ca. 97.5%) pollinated by the males of one species of bee, *Leioproctus platycephalus*. This specialization occurs in spite of there being more than 20 bee species in the areas where this spider lily is found. Other researchers will likely investigate other lily species



Australian orchid, the Candy Spider-Orchid
(*Caladenia versicolor*)

currently thought to be only food deceptive.

It is important to account for this specialization between a flower and its, essentially, sole pollinator when plans are made to conserve the orchid — the bees also need to be conserved. But most importantly, we must marvel at the implications for origins; viz., that such specialization results from design, not chance.

...to bee or not to bee...

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