

Creation Matters

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Clifford Burdick: Unjustly Expelled Twice (Part 2)

by Jerry Bergman, Ph.D.

Part 1, published in the previous issue, presented Burdick's early educational background and the events surrounding the rejection of his first attempt to earn a Ph.D. In this issue Dr. Bergman describes Burdick's second attempt to obtain a Ph.D. and documents the status of Cambrian palynology at the time of his controversial publications.

Some time later Burdick signed on at the University of Arizona to work with Gerhard Kremp (1913–1994), one of the world's foremost palynologists, one who studies contemporary and fossilized spores, pollen, and similar structures. Under Dr. Kremp, Burdick began a study of pollen microfossils in the petrified forest at the Grand Canyon. Later Kremp asked Burdick to analyze some of his own samples to attempt to identify their pollen content.

Pollen is extremely resistant to dete-

rioration and therefore is often preserved in rocks that contain no evidence of other plant material. For this reason, pollen and spores provide much more fossil evidence for the existence of certain kinds of plants. Burdick became very "skilled in separating these tiny objects from the rocks in which they were embedded" (Numbers, 2006, p. 291). After a full year processing the hundreds of samples, Burdick (1979) found evidence of

...pollen in samples from the top canyon rim to the Precambrian at the bottom in Hakatai shale many feet below the Precambrian/Cambrian division. Angiosperm spores were later found there also. This was a shock to evolutionist scientists who contended that angiosperm plants did not evolve until the Cretaceous.

Burdick sent some of the samples to Dr. Walter Lammerts, who had them analyzed at the University of California, Berkeley palynology laboratory. The pollen samples were identified by the lab as conifer (Burdick, 1979). Numbers (2006, p. 290) described what happened next:

One of the geologists at Arizona received a copy of John C. Whitcomb, Jr., and Morris's *Genesis Flood* as a Christmas present in 1964 — and noticed the credits to Burdick for providing pictures of giant human tracks and for reviewing the manuscript. The ensuing furor convinced Burdick that his days at the university were finally over, but he somehow managed to

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The 2nd Annual CRS Conference

by Lindsay N. Harold, M.A.T.

The 2nd Annual Creation Research Society Conference was held July 23–24, 2010 on the campus of the University of South Carolina–Lancaster. The CRS conference, as the meeting of a professional society in which ongoing research projects are presented, differs in scope and purpose from most other creation conferences. This year, as was the case last year, most talks dealt with research projects or ideas that were works in progress rather than polished presentations on completed research or well-accepted concepts.

Thus, the conferences provided presenters with a valuable means of airing ideas and receiving feedback, while giving others an opportunity to hear about the cutting edge of creation research. Many talks generated significant discussion, some rather animated or even controversial. The informal nature of the CRS Conference provided a valuable and unique forum for the exchange of ideas while also availing Society members an opportunity to fellowship and discuss creation science with their peers.



Left to right: Doug and Lindsay Harold, Matthew and Christa Speights. Photo by Danny Faulkner.

The 80 attendees at this year's conference included many who had attended last year, as well as some new faces. It was a pleasure not only to renew acquaintances, but also to meet others for the first time. Last year's conference was surprisingly successful in bringing together fellow creationists — Doug and Lindsay Harold, and Matthew and Christa Speights met their respective spouses at the 2009 conference and returned this year as newlyweds.

The unofficial kickoff for the conference was a cookout Thursday evening on campus. Danny Faulkner manned the grill

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Burdick Expelled (Part 2)

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stay on unofficially by telling his professors ... that he “was just the free-lance photographer who chanced to sell the pictures to Morris.”

Burdick (1965b) wrote that Kremp was very

...satisfied with my work in Palynology in the Petrified Forest, and wants to turn it into a thesis. Dr. Lacy ... was pleased to hear Dr. Kremp's good report on me. Dr. Lacy offered to try to get it accepted, but then ... Some well-meaning friend made a Christmas present to Dr. McCollough of the local geology Dept. of the Morris book, THE GENESIS FLOOD. When he saw my name mentioned as the one who took the track pictures, he hit the ceiling, and showed it to Dr. Kremp and the boss of the Geochronology Dept. Mr. Smiley. They note that I reviewed the manuscript, but what they did not know was that I gave a critical review ... for parts of it.

About this time (Burdick, 1979) the results of Burdick's study were published in the CRSQ

...as negative evidence for the evolution-uniformitarian model. News of this discovery struck the scientific world like a bomb, and the University began to receive complaints. Dr. Kremp then wrote a letter to the University Administration [falsely]

accusing me of careless laboratory work in allowing the samples to become contaminated. The pollen study project was dropped and I was told to keep quiet about my finding.

Alleged contamination

In a letter to Dr. Ted Smiley, Kremp openly stated that the reason for Burdick's university troubles was because of his doubts about Darwin. Kremp cited an article that Burdick had written titled “Microflora of the Grand Canyon” (Burdick, 1966b) in which Burdick endeavored, according to Kremp (1967),

...to prove a strange opinion of his on time and the great deluge, basing his conclusions on a contaminated palynological material macerated from Grand Canyon sediments,... the news reached us that he was not wanted in the Geology department—and we can see now clearly the reasons.... I told him when I saw his slides that they were contaminated.... Also I want to stress that I did not see at all his manuscript which he obviously wrote after he was excluded from our laboratories.

How Kremp “knew” that they were contaminated, he does not tell us, except that this would “explain” — actually explain away — the anomaly. As Numbers admitted, Burdick's degree problems were due to the fact that he uncovered evidence that contradicted the then current evolutionary theory. Evolutionists believe that modern pine-like trees did not evolve “until hundreds of millions of years later,” and Burdick's evidence indicates that this con-

clusion is incorrect (Numbers, 2006, p. 291). Actually, the “discovery of spores in pre-Cambrian strata is a significant but not totally unexpected find. The existence of spores in pre-Cambrian strata had been discussed as early as 1937” (Elliott, 1990, chapter 5).

Not unexpected

As early as 1935 vascular plants have been “known with certainty” in Lower Devonian, and reports of evidence of plants that are “undoubtedly Silurian” indicate further discoveries may push the date back even farther, as has been the trend in paleontology (Lang and Cookson, 1935). In 1937 Harvard Professor Darrah also reported spores typical of pteridophytes (non-seed vascular plants including ferns that use spores to reproduce) in Upper Cambrian, and the “Cambrian spores ... are quite different from any other known Paleozoic spores” (Darrah, 1937).

Ghosh and Bose (1952) also found several types of spores from “advanced vascular plants” in Cambrian or pre-Cambrian rocks taken from India, USSR, and Swedish Kolm. They concluded that “an earlier phylogeny of vascular plants [exists], going back to the Cambrian period and not the Silurian-Devonian period as is generally supposed.” In one geological area labeled Cambrian or pre-Cambrian, researchers found angiospermous wood, conifer wood, grass cuticles, and various microfossils and, among other fossils, six types of spores (Ghosh and Bose, 1947). They commented that “a vast literature has accumulated on

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the subject.”

Jacob *et al.* (1953) found evidence of well-preserved spores and tracheid fragments of vascular plants in middle and upper Cambrian zones, possibly Gymnosperm. They noted that “in view of the prevailing skepticism regarding the advent of vascular plants as early as the Cambrian, all possible precautions were taken against contamination and the results obtained by us were repeatedly checked.” It is now recognized that the “early fossil record was surprisingly richer and easier to unearth than anyone dared imagine” (Schopf, 2000).

Another early study found a “small but varied assemblage of primitive lower plants” including fungi and algae in pre-Cambrian rocks (Tyler and Barghoorn, 1954). The researchers concluded that “these plants are the oldest structurally preserved organisms that clearly exhibit cellular differentiation ... in pre-Cambrian sediments.” Even from an evolutionary view, this finding supports the possible existence of plant spores in the Cambrian.

Furthermore, the existence of ancient fossil pollen was also indicated in 1956 by the work of paleobotanist Suzanne Leclercq (1956), who wrote that the discovery of spores in the Cambrian “supports the view that a more varied and advanced type of flora existed than the plant impressions have so far suggested.”

University of California professor Daniel Axelrod (1959) wrote that almost “60 Cambrian spore-genera” had been documented, and that “the report of spores ... in the Cambrian is not at all surprising.” Axelrod concluded that the “future discovery of a Precambrian vascular land flora of complex nature should therefore not amaze us.” He also pointed out that evidence for vascular-containing woody fragments of land plants dates back to the Cambrian. Axelrod (1959) noted that at least six different types of vascular plants have been identified in Cambrian samples, including ferns and gymnosperms.

Many other examples of seeds or spores existing in very early fossil strata could have been found in the literature at the time, including in both *Nature* and *Science* (Sigels, 1971; Coates *et al.*, 1945; Ghosh and Bose, 1952; Bose, 1947; Doher, 1980; Sahni, 1944). If Kremp had done a careful literature search, he would have found these

and many other similar research studies that were published before he made his judgment about Burdick’s claims.

Evaluation of the spore affair

There appears to be no valid reason for Kremp to conclude that Burdick’s finds had been contaminated. The reason Kremp excluded Burdick from his lab, as Kremp openly admitted, was Burdick’s doubts about Darwinism, not his competence. Kremp had concluded earlier that Burdick’s results “could not have been a contamination,” but later changed his mind and argued that his results were due to contamination (Burdick, 1966a). Burdick wrote that Ghosh and Bose (1947) identified the same spore or pollen type from the Devonian in the Salt River Canyon as Burdick had found, and wondered how Kremp would respond when he saw the microphotographs. He wrote (Burdick, 1966a),

Burdick’s degree problems were due to the fact that he uncovered evidence that contradicted the then current evolutionary theory.

...it is preposterous to say they are all contaminations. I failed to find a single conifer in all the other formations, Tapeats sandstone (Cambrian), Bright Angel Shale (Cambrian), Muav (Cambrian), Redwall (Mississippian), Supai (Permian) or Hermit shale (Permian), or Bass limestone (Precambrian). If they are contaminations why should they all be concentrated in the Hakati? The contaminations are from present day plant life and mostly colorless. All these conifer spores are reddish in color, indicating long burial.

In another letter, Burdick (1966c) added that the problem was that Kremp was fearful his reputation could suffer if some anomalous fossil pollen and spore data were published, and

...his scientific standing will be impaired and perhaps his job endangered. He did admit, however, if continued macerations of Hakati samples still show up conifers and angiosperms, then he will have to admit they belonged there ... If he does not like my publishing the data

I have worked so hard to gather at my own expense, he will just have to lump it ... As I have explained so many times, I don’t think one in a hundred of the spores I found could be contaminations, and that lone one would not upset the trend.

Lammerts (1966) then wrote he could not understand the problem, because the fact that Kremp

...trained you in palynology does not mean you are his slave. Had he been paying you to do the work I can see his reason for feeling upset. But these people will have to wake up to the fact that very respectable scientists have our viewpoint and let us all have academic freedom to publish as we see fit.

Howe (1986) wrote that from 1964 to 1965, Burdick, together with members of the University of Arizona Geochronology Department, completed an analysis of microfossils recovered from the petrified forest, rocks that had been collected by Gerhard Kremp. According to Howe (1986), Burdick

...reported that “We had especially good results with fine microphotographs of many species of Chinle formation conifers.”

Kremp, according to Burdick, had likewise secured rock samples from various other strata of the Grand Canyon, Arizona. These were also macerated and while examining the extracts Burdick surprisingly recovered spores of various land plants from late Precambrian Hakatai shale! ... Burdick noted opposition to his pollen discovery from various unnamed sources but he also named two instructors who defended his technique, one of whom was Kremp who had done the sample collecting and at this time still evidently resisted the idea that he might himself have contaminated the samples in the field or that they might have been contaminated by Burdick at the University of Arizona Geochronometry Laboratory using his (Kremp’s) own standardized techniques.

Discouraging or stopping research may slow a scientific revolution, but to oppose progress in science is futile in the long run (Kuhn, 1970). Replication is necessary in order for the validity of Burdick’s findings to be properly evaluated; replication that, as far as I am aware, has never been adequately

completed. Some creationists have openly criticized certain aspects of Burdick's work, but no creationist has tried to censor it (Chadwick, 1980, 1981; Chadwick, DeBord, and L. H. Fisk, 1973).

Burdick himself was cautious about his findings, once writing to Lammerts that "as for the Precambrian spores, I have done more work, and have recovered other comparatively recent spores — early Tertiary — from the Hakati formation, but we need to take more ... samples from those formations before we can draw definite conclusions" (Burdick, 1965a). For updated research see Howe, *et al.* (1986, 1987, 1988) and Rush (1982).

Even if his samples had been contaminated, it would in no way have justified the department's denying his degree. The proper response would have been to require him to replicate the research, or to complete another project. Many students undertake two or even three projects before successfully completing one for their Ph.D. requirements. The university's treatment of Burdick was clearly inappropriate and *prima facie* evidence of discrimination.

The University of Physical Science affair

In 1967 Burdick informed Lammerts that he had transferred his University of Arizona credits to the University of Physical Science in Phoenix, Arizona, and on May 14, 1966, they granted him a Ph.D. In March of that year Lammerts wrote to Morris, who was then CRS president, questioning the validity of Burdick's Ph.D. (Lammerts, 1967). On May 13, 1967, CRS board member Wilbert Rusch forwarded several letters from the Arizona Department of Education to Lammerts documenting that no such organization was recognized by the state (Elliott, 1990). Fearing that Burdick's Ph.D. had come from a "diploma mill," they reasoned that accepting this degree as genuine would compromise CRS' credibility as a professional organization.

Others on the CRS board shared Lammerts' concerns over Burdick's implication that he had obtained a degree from an approved, degree-granting institution (Morris, 1964). Wilbert Rusch wrote to Lammerts, questioning *all* of Burdick's college work, including his M.S. work in geology at the University of Wisconsin (Rush, 1969). Lammerts even discussed the possibility of asking Burdick to resign from the CRS board (Lammerts, 1969b). During this debate Burdick was suspended from the board

until the matter could be resolved.

The situation changed somewhat when William Rhodes, Ph.D., president of the University of Physical Sciences, explained that the university was a group of science and other professionals organized to grant academic honors to those overlooked by other institutions (Rhodes, 1969). The organization's board included Harrison Lang, Ph.D. and Donald Carter, Ph.D., both respected scientists. Morris, Lammerts and others on the CRS board finally agreed to allow Burdick to remain on the board, but listed him as having a Masters degree and not specifying his major, rather than a doctorate (Morris, 1993, p. 203). He did have a Masters from Andrews University in Michigan, not from the University of Wisconsin, as Solomon and Morgan inferred (Lammerts, 1969a). Henry Morris (1971) wrote to the entire board informing them that they owe Burdick

...an apology for the way he has been criticized and a vote of thanks and confidence for the extensive research in geology he has conducted for our

The skills of a very talented scientist were largely wasted, all because of Darwinists' intolerance toward his worldview.

Society. Various individuals have questioned not only his ability but even his scientific honesty, and yet he has continued to be gentle and gracious in his responses and has tried in every possible way to satisfy every demand. His overthrust studies, his pollen studies and his footprint studies have all been attacked, not only by his evolutionist colleagues, but even by some of us. Yet he has patiently amassed an abundance of evidence that his data and interpretations were valid, all along, in every case. Furthermore, instead of going to his assistance when the University of Arizona denied him the Ph.D. in geology which he earned there ... we instead rebuked him for listing the perfectly legal honorary Ph.D. which he was awarded in recognition of his many contributions in field geology. He has probably done more research for the Society, at greater personal sacrifice, than anyone else, all of it in areas of critical importance. I personally ap-

preciate his contributions and his attitude very much, and I hope others of you feel the same way and will let him know.

Critics and friends alike have cited inaccuracies in Burdick's background in various write-ups about him as evidence of his lack of integrity. Where the fault lies is unknown, but I have not uncovered any communications by Burdick in which he misled anyone. Admittedly, some of his published papers were justifiably criticized by Burdick's fellow creationists. The fault here lies not just with Burdick but also with the editors and reviewers involved in publishing his papers. It must be remembered that he was involved in CRS from its inception, and both the quality and number of its Ph.D. level supporters has increased greatly since then.

Burdick was also involved in some questionable projects, especially later in his life when his health was deteriorating. This reflects a pattern that is not uncommon even among well-established scientists. Nonetheless, he has received criticism from more insiders than has any other person active in the CRS since its founding in 1963. Some of it was probably justified, but much of it clearly was not.

Burdick suffered major repercussions from the intolerance to which he was subjected throughout most of his academic career. He experienced what sociologists have termed "downward drift" in his struggle to survive in science — or in any other occupation. The skills of a very talented scientist were largely wasted, all because of Darwinists' intolerance toward his worldview.

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Math Matters

by
Don DeYoung, Ph.D.



Bayes’ Theorem and the Existence of God



Thomas Bayes (1702–1761) was a British mathematician and pastor. His much-used theorem involves probability calculations. Examples are readily available elsewhere. Briefly, suppose one has a container with a mixture of white and black marbles. If one draws out a white marble, the theorem explains what can be probabilistically said about the number of remaining white and black marbles.

One interesting application of Bayes’ theorem is an attempt to derive the probability that God exists. This problem was first discussed by Pastor Richard Price

(Bayes and Price, 1763), and such efforts continue today. Philosopher Richard Swinburne, a colleague of Richard Dawkins at Oxford University, calculates the probability of God’s existence at more than 50 percent (Swinburne, 2004). He also calculates the probability of Jesus’ resurrection at 97 percent (Swinburne, 2003). Dawkins rejects these conclusions because of the assumptions made (Dawkins, 2006). That is, Swinburne assigns God’s existence an initial probability of 50 percent since there are only two choices: God either exists or does not.

The debate goes on regarding the applicability of probability arguments to God. This controversy reminds one of “prayer tests” whereby a select group of hospital cases are prayed for, then later compared with non-prayed-for persons. How patient must be the Creator of the universe as He looks down upon the silliness of mankind.

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...without excuse!

by Timothy R. Stout

THE TESTIMONY OF PHYSICAL LIFE

Can science prove that there is a living God, One who has the power to function outside of and independently of natural law and who has infinite intelligence? Technically speaking, the answer is “No.” That is because man cannot devise a reproducible experiment which controls the behavior of such a God. Since science is the study of reproducible behaviors, this seemingly makes the proof of God outside the scope of science.

Yet, this is not the end of the story. For instance, if we consider issues related to the origin of life, we find that science reveals to us reason after reason, principle after principle, observation after observation showing that we should not exist. Yet, we do. The only rational explanation for the existence of life is that it was placed here by a Being who is not bound by natural law. In other words, it was placed here by a living, intelligent Creator God.

What is truly noteworthy about these many reasons is their ubiquity. If a scientific principle or observation touches in some manner on the origin of life, one finds that the more carefully he studies it the more clearly it shows the impossibility of natural origins. To believe in a natural origin of life one must give up the laws of chemical equilibrium (Stout, 2009b) and the laws of statistics (Stout, 2010). One must ignore the principles of entropy and information theory (Stout, 2008a). One must ignore fundamental limitations in the capabilities of natural selection (Stout, 2008b; 2009a). Indeed, almost every article in the entire “...without Excuse” series in *Creation Matters* touches on some aspect of this observation. Beyond this, one could pick almost any issue of *CM* at random and find within its pages a number of other articles which show the implausibility of natural origins.

From a scriptural perspective, this is exactly what we should expect. God designed His Creation to give testimony of Himself. In Psalm 119:1 we read, “The heavens declare the glory of God; and the firmament shows His handiwork.” In this verse God clearly states that the things that He made reveal Him and His greatness (His glory). From this passage, we would expect that if God designed the universe and the

things in it to glorify Him and reveal knowledge about Him, then the deeper and more carefully we study these things, the more clearly they should reveal His existence and His glory. This is exactly what we find.

Yet, the story does not stop here. In Romans 1:20 we read, “For since the creation of the world His invisible attributes are clearly seen, being understood by the things that are made, even His eternal power and Godhead, so that they are without excuse....” This verse goes beyond Psalm 119,



specifically stating that God made the creation in such a manner that it reveals not only that He created it, but also reveals many of His personal characteristics or attributes. Furthermore, He has made this revelation so clear that *He* considers a person “without excuse” who refuses to see it.

However, the story goes even beyond this. Isaiah 43:9 reads, “Let all the nations be gathered together, and let the people be assembled. Who among them can ... show us former things? Let them bring out their witnesses, that they may be justified; or let them hear and say, ‘It is truth.’”

In this passage God is taunting those who reject Him. He is asking them to declare accurately what took place in the past, knowing that they *cannot* do this. I believe the creation account is contained within the scope of this verse. So, in effect God is challenging a person either to describe accurately what happened in the days of creation or to believe Him and say that He is the Creator and that His account is truth.

The important thing about the above verse is that it indirectly teaches that a

person who rejects God’s testimony of what took place in the past will be incapable of offering a reasonable alternative. Thus, all of the contradictions and inconsistencies inherent in the evolutionist’s alternative explanation of origins are to be expected. God designed His creation to result in the failure of any attempt to offer an alternative to His own testimony. This is to force an honest person to say concerning His word, “It is truth.” A similar passage is found in Isaiah 41:21–22.

We can make an important observation: God offers an essentially unlimited amount of evidence revealing that He is the Creator. Science is significant in that it provides tools to uncover much of this evidence. The deeper one looks at the issues, the more evidence he finds. Do you want more evidence? It is there, ready for you to receive it. Just go look for it.

A person can harden his heart such that no amount of evidence can convince him. How strong an argument would it have taken for Stephen to convince the Pharisees and chief priests that Jesus was the Messiah when they were plugging their ears (Acts 7)? Such an argument does not exist. It does not matter how strong an argument is when a person plugs his ears so he won’t hear it.

We see the same situation in dealing with evolutionists. God deliberately made the evidence concerning Him and the truth of His word clear and unlimited in quantity, even as science confirms. If a person does not see this, the problem is with his heart, not with the evidence.

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Speaking of Science

Editor's note: Unless otherwise noted, S.O.S. (Speaking of Science) items in this issue are kindly provided by David Coppedge. Opinions expressed herein are his own. Additional commentaries and reviews of news items by David, complete with hyperlinks to cited references, can be seen at: www.creationsafaris.com/crevnews.htm. Unless otherwise noted, emphasis is added in all quotes.

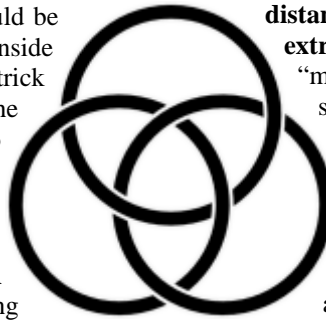
DNA Performs the Linking Rings Trick

Those who love a good magic show should be aware of a world-famous trick going on inside their own bodies. The “Chinese linking rings” trick is done by a team of protein magicians in the cell — but it’s not for entertainment, it’s to repair damage that could lead to cancer.

*PhysOrg*¹ echoed a press release from UC Davis about a team of proteins named Sgs1, Top3, and Rmi1. This magic team makes DNA strands pass through one another when repairing double-stranded breaks. The team has to get the information from the matching chromosome, so “a sophisticated repair process is activated that uses the same DNA sequence on the matching chromosome,” the article explained. “One of the strands is stripped back, leaving an exposed single strand. The matching chromosome is brought alongside and partly unwound, and acts as a template to repair the broken piece.”

Aside from the wonder at how protein machines can find a matching strand on another chromosome, when the chromosomes separate at points called Holliday junctions, the real magic happens. “To finish the process, the chromosomes have to separate — like the magician’s interlocking rings, one has to pass through the other.” Stephen Kowalczykowski, microbiology professor at UC Davis, remarked, “This protein complex does what magicians do.”

1. UC Davis (2010, October 11). DNA and the ‘magic rings’ trick. *PhysOrg*. Retrieved October 18, 2010, from www.physorg.com/news/2010-10-dna-magic.html



In any case, by examining **samples within a small window of well-constrained depositional ages from across the length of the Himalayan range**, our data not only indicate **extraordinary transport distances**, but a **high degree of sediment mixing and homogenization**.

They emphasized it again: “In this regard, both **transport distances** and **sediment mixing** within early Gondwana are **extraordinary for the geologic record**.” It likely applies to “much, if not the whole of Gondwana” (the hypothetical supercontinent that broke up into today’s continents).

The Himalayas are not the only location. They referred to evidence published earlier that assigns the origin of many of the Grand Canyon sediments to the Appalachian mountains thousands of kilometers to the east. Again, extraordinary long-distance transport mechanisms must have been in operation. What could possibly do it? Their short list of possible mechanisms omits one that creation geologists would probably be saying is intuitively obvious: a global flood.

The **causes** of such a pattern **might be unique to time and place**, and may include a **combination** of (1) **lack of continental vegetation**, (2) **clustering of continents** near the equator, (3) **increased continental weathering rates**, (4) widespread **uplift** and **erosion** associated with **regionally extensive and relatively synchronous orogenesis** [mountain-building] recording **supercontinental amalgamation**, and (5) **production of significant relief**, providing **stream power for large-scale river systems**.

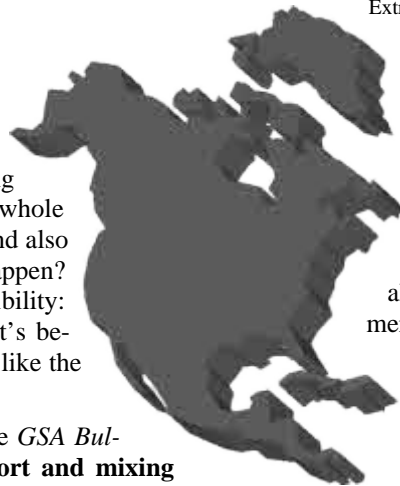
A closer look reveals that none of those mechanisms contradicts a global flood; in fact, they would each appear to be consequences of one. What else would produce any one or a combination of those causes?

1. Myrow, P.M., N.C. Hughes, J.W. Goodge, C.M. Fanning, *et al.* 2010. Extraordinary transport and mixing of sediment across Himalayan central Gondwana during the Cambrian-Ordovician. *Geological Society of America Bulletin* 122:1660–1670.

Did a Global Flood Move Rocks Across Continents? No, uh...

Geologists were baffled. Something moved rocks up to 3,000 miles across whole continents. They found evidence in Asia and also in America. How on earth could that happen? Their list of explanations omitted one possibility: the transporting power of water. Maybe it’s because it would have implied a global flood like the world had never seen.

An international team publishing in the *GSA Bulletin* wrote about “**Extraordinary transport and mixing of sediment** across Himalayan central Gondwana during the Cambrian-Ordovician.”¹ They found similar detrital zircon samples across a wide swath of the Himalayan foothills, covering “great distances” of at least 3000 km and perhaps as much as 5000 km. They used assumptions to rule out time as a factor, suggesting that this “**extraordinary**” transport of material occurred at one time. What does it imply?



Dino-Bird Link Confused by New Fossil

A “bizarre” new dinosaur fossil, found in Spain with a hump on its back that resembles a fin, also has quill knobs on its arms, interpreted as attachment points for feathers. For this reason, the *BBC News*¹ announced that it “may” yield clues to the origin of birds.” It has been named *Concavenator corcovatus* and was described in *Nature*.²

The fossil, however, does not provide unequivocal evidence for a dinosaur-bird kinship; *LiveScience*³ said this fossil “surprises and puzzles experts,” and even *National Geographic (NG)*,⁴ which a decade ago embarrassed itself with *Archaeoraptor*, seemed to downplay the dino-bird link, calling it a “carnivorous camel” in its headline. Whatever attachment points the bumps on its skimpy forearms provided (assumed to be quill knobs for feathers) were certainly not anything like flight feathers of birds. *NG* called them “protofeathers” but the filaments in the

artist's reconstruction (not found on the fossil) may have been merely for display, since the discoverers could not think of any locomotive or thermoregulatory function for them.

NewScientist alleged, "This pushes back the emergence of theropods with bird-like feathers by some 50 million years." *LiveScience*, however, was more cautious, stating that the idea the bumps were anchor points for feathers is "only speculation at this point...." The authors of the paper in *Nature* said only that "These bumps correspond topographically to, and are morphologically similar to, feather quill knobs, and we consider them homologous to those present in many birds." The comparison photos, though, do not show them equidistant as on modern birds. At the end of the paper, they speculated on how to interpret the bumps:

Recent findings have reported the presence of filamentous tubular integumentary structures in ornithischian dinosaurs such as the heterodontosaurid *Tianyulong* and the ceratopsian *Psittacosaurus*. **The debate about the homology between these structures and bird feathers is open.** If ornithischian tubular filaments are a kind of feather, they are an **evolutionary novelty in dinosaurs**, and their presence is expected in non-maniraptoran theropods such as *Concavenator*. **If they are not a type of feather**, *Concavenator* marks the most primitive presence of non-scale skin appendages in the theropod lineage, placing them at the node *Neotetanurae*. The simplest hypothesis about the ulnar *Concavenator* skin appendages is that they are **short, rigid filaments** (Fig. 2). However, it is **possible** that they **might** have had barb ridges, because these structures appear before the formation of the follicle. In any case, *Concavenator* shows that the combination of scale and non-scale skin appendages exhibited in present-day poultry was **already present in large theropod dinosaurs** 130 million years ago.

Another surprise is that this member of the carcharodontosaurid ("shark-tooth") family was found in Europe. "Ten or 12 years ago everybody thought that carcharodontosaurids were a group that was exclusive to South America and Africa," *NG* quoted a paleontologist as saying. Now they have to surmise that the group originated in Europe then drifted or migrated across the globe.

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Synonymous Codons: Another Gene Expression Regulation Mechanism

Some words in English have alternate spellings, but sound the same. If the sound is the same, how would a recording device tell them apart? Would it make any difference? It shouldn't, but now scientists are realizing that genetic codons spelled differently can

influence the protein formed — even when the spellings, called "synonymous codons," produce the same amino acid when translated.

Suppose you are a prompter at a spelling bee. You read the word "aneurysm" aloud as the next word to be spelled. One student spells ANEURYSM, the next spells it ANEURISM. Since both forms are acceptable according to the dictionary (though the first is more common) each student should be graded as correct. But imagine that the judge, listening to the second spelling and not as familiar with it, has to check the dictionary before announcing her decision. Now suppose that the slight time delay affects what a reporter has time to write before rushing his story to the press. The resulting story could differ substantially, even though the two spellings are, for all practical purposes, equivalent. Something like that happens in the genetic code, according to researchers at the University of Pennsylvania, publishing in *Science*.¹

There are 64 possible triplet codons in the DNA code, but they produce only 20 amino acids. Some amino acids can be coded by up to six "synonyms" of triplet codons: e.g., the codes AGA, AGG, CGA, CGC, CGG, and CGU will all yield arginine when translated by the ribosome. If the same amino acid results, what difference could the synonymous codons make? The researchers found that alternate spellings might affect the timing of translation in the ribosome tunnel, and slight delays could influence how the polypeptide begins its folding. This, in turn, might affect what chemical tags get put onto the polypeptide in the post-translational process.

In the case of actin, the protein that forms transport highways for muscle and other things, the researchers found that synonymous codons produced very different functional roles for the "isoform" proteins that resulted in non-muscle cells — beta-actin progressing to the sites of cell movement at the membrane, and gamma-actin staying in the interior, "in dense non-branched networks and long contractile stress fibers that impart morphological stability and support cell adhesion."

Though both forms were "arginylated" with an arginine tag after translation, the beta-form appeared to start folding earlier, producing a slightly different shape that affected other post-translational modifications, thus affecting its functional role in the cell. The gamma form also got tagged with ubiquitin, targeting it for earlier degradation in the proteasome.

The authors proved that it was the different codon spellings that produced these changes by modifying the codons in both genes with their look-alike synonyms and watching the outcomes. Sure enough, the beta-actin gene produced a protein that acted like gamma-actin when spelled the gamma way, and the gamma-actin gene produced a beta-actin-like protein when spelled the beta way.

The authors extended the principle they discovered to say, in conclusion, "This **mechanism** may be **used not only with actin** isoforms but also with **other closely homologous** but selectively arginylated **proteins**." As a result, an alternate spelling difference in the DNA code can result in different functional outcomes for two isoforms of actin, even though their amino acid sequences are essentially identical (98%). This amounts to a new mechanism for regulation of the genome and proteome (the set of proteins in the cell).

Ivana Weygand-Durasevic [U of Zagreb, Croatia] and Michael Ibba [Ohio State], commenting on this finding in the same issue of *Science*,² recognized it as a fundamental



discovery: “This is **an unexpected example** of proteins whose **properties are determined at the nucleotide** rather than the amino acid level, **forcing a reassessment of what defines a synonymous change in a gene sequence.**” In their conclusion, they repeated, “Whatever the exact mechanism, the discovery of Zhang *et al.* that **synonymous codon changes can so profoundly change the role of a protein** adds a **new level of complexity to how we interpret the genetic code.**”

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Hairy Bacteria Walk and Talk

Little hair-like projections on some bacteria, nearly invisible with light microscopes, are not just for decoration. They do amazing things — as a pair of recent discoveries brought to light. They help bacteria walk and talk.

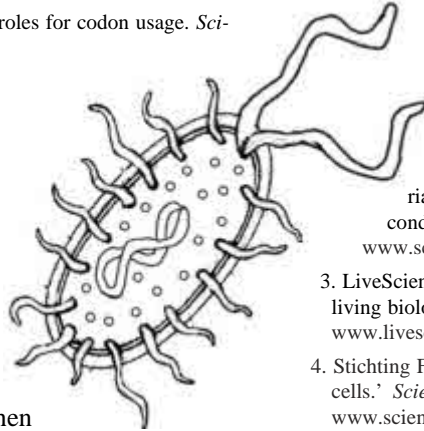
But can they dance? Bacteria swim, but they also land on surfaces — and when they do, they put out little legs and walk. This fascinating discovery, discussed on *ScienceDaily*,¹ was made at UCLA. The legs are called “type IV pili” in *Pseudomonas*, some of which cause diseases in humans. “What enables this upright walking are appendages called type IV pili, which **function as the analog of legs,**” the article said. “What’s more, walking allows *P. aeruginosa* to **move with trajectories optimized for surface exploration,** so that they can forage more effectively.”

Social network? Some bacteria are “wired” with their own electrical intranet. This was announced also by *ScienceDaily*² in an article titled, “**Bacteria Grow Electrical Hair: Specialized Bacterial Filaments Shown to Conduct Electricity.**” Tiny microfilaments extend out between bacteria to provide a means of communication and mutual support — a kind of cellular FaceBook system. These create large “**living biological circuits**” (see *LiveScience*³) made of “biological nanowires” that function just like social networks. “This is the **first measurement of electron transport along biological nanowires produced by bacteria,**” a researcher said.

*ScienceDaily*² explained, “A **bacterial nanowire looks like a long hair** sticking out of a microbe’s body. Like human hair, it consists mostly of protein.” Imagine if people communicated through their hair. For bacteria, these networks are like a lifeline. They exchange electrons, allowing bacteria to “breathe” and also communicate.

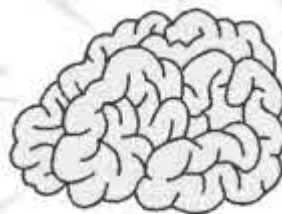
Microbes were already known to communicate with chemical signals. The nanowire networks apparently provide a faster channel. Said one of the researchers of the wired net, in stressful situations or when survival is at stake, “**You want the telegraph, you don’t want smoke signals.**” One can only guess at what they are saying. Do they speak in Morse code? “The current hypothesis is that **bacterial nanowires are in fact widespread in the microbial world,**” he added.

Humans tend to fear bacteria because of the few nasty kinds



that cause disease, but many of these mechanisms at work in the microbial world may actually be beneficial. That growing feeling extends to viruses, too. *ScienceDaily*⁴ in another article spoke of a burgeoning field of “physical virology” that might allow doctors to employ viruses as “natural nanoparticles” for targeting therapeutic agents to cells, and another article in *ScienceDaily*⁵ discussed using “friendly bacteria” to treat bone cancer. Could the germs we fear have had a function for good in the beginning? Food for thought. *Answers in Genesis*⁶ presented a lengthy article examining possible pathways by which some beneficial *E. coli* and other bacteria might have degenerated into agents of disease.

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Brain Rewires for Lost Senses

Born without vision or hearing? The brain can apparently rewire itself to accommodate the loss, reported the *BBC News*.¹ Dr Stephen

Lomber, who led research published in *Nature Neuroscience*, said:

The brain is very efficient, and doesn’t let unused space go to waste.

The brain wants to **compensate** for the lost sense with **enhancements** that are **beneficial**.

For example, if you’re deaf, you would benefit by seeing a car coming far off in your peripheral vision, because you can’t hear that car approaching from the side — the same with being to [sic] more accurately detect how fast something is moving.

Dr. Lomber’s team studied the peripheral vision of congenitally deaf cats. The general principle was that the brain does not like to let unused capacity go to waste. “Both deaf and blind people frequently say their **other senses are sharper by way of compensation.**”

1. Anonymous (2010, October 10). Deaf people ‘can rewire brains’. *BBC News*. Retrieved October 18, 2010, from www.bbc.co.uk/news/health-11501120

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Matters of Fact...

by Jean K. Lightner, DVM, MS

The Days of Genesis 1

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 I have heard that the Hebrew word for day, *yom*, does not mean an ordinary day in Genesis 2:4 and that this somehow contradicts the idea that the days of Creation in Genesis 1 can be ordinary days. Is this true?

A No. As with the English word day, the Hebrew word *yom* has several different meanings. And as in English, the context makes clear which meaning is intended.

Genesis 1 uses *yom* in two ways, both of which are introduced in verse 5. In the first part of the verse, "God called the light Day [*yom*] and the darkness he called Night." Here *yom* describes the daylight portion of a day much like in English when we use the phrase during the day. The Hebrew word is also used in this way in a few other places in Genesis 1 (vv. 14, 16, 18). In each case the context makes it very clear which definition is intended as the word for day is used in contrast to night.

The second definition is found immediately following the first in verse 5. "And there was evening and there was morning: one day [*yom*]." Although many translations will render this "the first day," "one day" is more literal. It can be understood as defining a day as a dark/light cycle. To the Jews, a day always began with evening. All of the six days of creation are clearly tied to the dark/light cycle (Genesis 1:5, 8, 13, 19, 23, 31). Ordinal numbers (second, third, etc.) are used for days 2 through 6. The context makes it clear that they refer to what we might call ordinary, 24-hour days.

In Genesis 2:4, the word *yom* is used very differently than in chapter 1. It has a preposition attached to it; the Hebrew *b^e* meaning "in" or "on." It is used before a verb (in the infinitive construct form). This construction, *b^eyom* when followed by an infinitive, carries the meaning of "when" (Gesenius, 1979, p. 341). Many translations (e.g., NIV, NET) translate it as "when" in Genesis 2:4 and in other places where this pattern appears (Genesis 2:17, 3:5; Exodus 10:28; Isaiah 11:16).

Q If the meaning of *yom* in Genesis 1 is so clear, why are there so many scholars that question its meaning? Are they just a bunch of liberals who are trying to attack the Bible?

A In answer to the latter question, the answer is usually no. Ironically, questioning the straightforward meaning of *yom* in Genesis 1 is more common among people who tend to be relatively conservative and claim to view the Bible as true and authoritative. They generally hold to the view, much like "young-earth" creationists, that if the Bible is true it will be consistent with the world around us. The difference is how they handle perceived inconsistencies.

A very enlightening quote comes from *Systematic Theology* by Charles Hodge. This was originally published back in the 1870s.

The geological objections to the Mosaic record are apparently the most serious. According to the commonly received chronology, our globe has existed only a few thousand years. According to geologists, it must have existed for countless ages. And again, according to the generally received interpretation of the first chapter of Genesis, the process of creation was completed in six days, whereas geology teaches that it must have been in progress through periods of time which cannot be computed.

Admitting the facts to be as geologists would have us to believe, two methods of reconciling the Mosaic account with those facts have been adopted. First, some understand the first verse to refer to the original creation of the matter of the universe in the indefinite past, and what follows to refer to the last reorganizing change in the state of our earth to fit it for the habitation of man. Second, the word day as used throughout the chapter is understood of geological periods of indefinite duration.

...

It is of course admitted that, taking this account by itself, it would be most natural to understand the word in its ordinary sense; but if that sense brings the Mosaic account into conflict with facts, and another sense

avoids such conflict, then it is obligatory on us to adopt that other. Now it is urged that if the word "day" be taken in the sense of "an indefinite period of time," a sense which it undoubtedly has in other parts of Scripture, there is not only no discrepancy between the Mosaic account of the creation and the assumed facts of geology, but there is a most marvellous [sic] coincidence between them.

Although Charles Hodge was a well respected, well educated, conservative theologian who made many valuable contributions, he reconciled the supposed "facts" of geology with Scripture by changing his understanding of Genesis from what the church had historically believed. To be fair, he was not a scientist and perhaps did not understand that science cannot give such definitive answers about history. However, being pressured into changing our mind about what God has said is bad news (Genesis 3; 1 Samuel 15). It is important for Christians to learn to question the so called "facts," rather than to change our views on Scripture to accommodate them.

There are many resources today that show that the "facts" of geology which influenced theologians such as Hodge were actually interpretations of evidence within an anti-biblical worldview. Many supposed "facts" within geology have changed over the last 100 years, but secular scientists still interpret evidence within a framework that assumes Genesis is not historically accurate.

It is important for Christians today to understand the underlying assumptions behind what is presented as fact, and to know that the geologic evidence fits well within the historical context presented in Genesis. If you would like to get your hands on some of these resources, many are available at the CRS online bookstore, www.crsbooks.org.

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2nd Annual CRS Conference

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and everyone had a good time eating and talking while watching a slideshow of photographs from last year's conference. Danny's infamous fireworks were set off Thursday and Friday evenings at his home, but this year there were no police in attendance.

The conference officially began on Friday morning with welcoming remarks from the dean of the college, John Catalano. Catalano, who also spoke last year, reiterated his commitment to academic freedom, stating that though he disagreed with the views of creationists, he would defend their right to hold them. He also mentioned the important and historic role that Christianity and creationist views have played in the development of science.

The plenary session on Friday morning was delivered by Tom DeRosa, who gave an informative lecture on the fossils of Bone Valley in central Florida and their importance within a young earth framework. He also talked about the continuing work that his group, Creation Studies Institute, is doing in the area. Saturday's plenary session featured Jonathan Sarfati of Creation Ministries International. His engaging talk centered around defeating the "apparent design" arguments of Richard Dawkins, which Sarfati does very effectively in his recent book

The Greatest Hoax on Earth? The remaining 28 talks, which were offered in two concurrent sessions on both Friday and Saturday, were representative of various areas of study, including biology, astronomy, geology, physics, archaeology, and philosophy.

Plenary sessions, which lasted an hour, were held in a large room where everyone gathered for opening remarks and lunches, while the other talks were held in two smaller rooms in a neighboring building. Regular talks lasted 30 minutes, followed by 10 minutes for Q&A. Lunch was made available each day by Danny Faulkner, his wife Lynette, and several of their friends and family who all worked tirelessly in doing the groundwork in preparation for the conference. Dinner on Friday and Saturday was Dutch treat at a local restaurant.

The 2nd Annual Henry M. Morris Memorial Lecture, given on Friday evening by Dr. Duane Gish, was open to the public. Gish, along with Drs. Henry Morris and John Whitcomb, is one of the founders of the modern creation science movement. Gish's talk, entitled "The Death of Darwinism," was well attended and provided many people the opportunity to hear for the first time this nearly legendary figure. A DVD of the presentation is available.*

The conference concluded Saturday evening with an informal panel discussion. Questions were asked on a variety of topics,

and those who were knowledgeable on the topic took turns providing their input. Some questions were answered rather easily and without disagreement, while others sparked controversy or had answers that were unknown. Overall, it was a good and enjoyable time of discussion.

On Sunday, some people who remained in Lancaster attended talks by Kevin Anderson or Duane Gish at local churches. Sunday afternoon there was a field trip to Woods Bay, one of the Carolina Bays. These numerous, elliptical depressions, which are found along much of the eastern coast of the US, are of unexplained origin. Several conference attendees toured the bay and discussed possible origins within a young earth framework.

The overall response to this year's conference was very positive. There were five more attendees this year than last, and those who attended learned a lot and really enjoyed it. The conference for 2011 will be held July 22–23 at Trinity Baptist College in Jacksonville, FL. You won't want to miss it.

*To obtain a DVD of Dr. Gish's presentation, along with a second DVD containing interviews with Robert Carter, Dan Schobert, and Tom Foltz, send a check for \$8 to RAE, P.O. Box 80664, Lansing, MI 48908.

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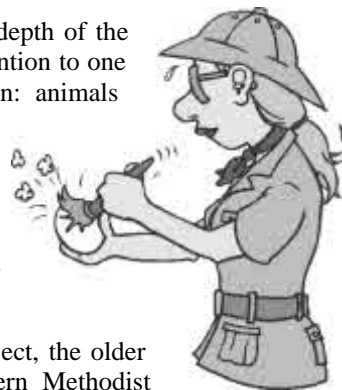
Animals Can Skew Archaeological Dates

Archaeologists date stone age artifacts by the depth of the layer. They may not have paid sufficient attention to one factor that could have shoved them deeper down: animals trampling over them. "Animals push human tools into ground — and back in time, study says," was a subtitle of a report in *National Geographic News*.¹ This factor could cause misdating of stone tools and other artifacts, "making them seem older than they really are — in some cases, thousands of years older," experiments have demonstrated.

The assumption has been, "The deeper the object, the older it is, generally speaking." A team from Southern Methodist University tested that assumption by placing artifact replicas on the ground in India, having local herdsmen walk their livestock over them, letting the ground dry out, and then excavating the plot like it was a real archaeological site. "To our amazement," lead author Metin Eren said, "the disturbance was much greater than we had anticipated."

The misdating is especially pronounced in wet ground. But it is precisely in wet areas where stone age people most likely

settled. What's more, archaeologists typically date carbonaceous material next to stone artifacts to corroborate the date, unaware that the two types of material may not have been contemporaneous.



Eren believes that evidence of trampling can be detected by the random orientations of artifacts. In some cases, artifacts might even be pushed upward and yield younger ages. Sorting out what happened could be tricky, though. "Trampling could even create the **illusion of ancient sites where none really existed**," Eren said. For example, "you could have artifacts washing into a valley from somewhere else and herds walk over them, pushing the artifacts into the ground.

Is this a minor matter? Anthropologist Julien Riel-Salvatore of the University of Colorado Denver said, "Pretty much **any open-air site located near a water source will potentially be very seriously affected by some of these conclusions**."

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All by Design

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Tick Antifreeze

Evolution tries in vain to explain the mysteries of life and of the natural world apart from a Supreme Being. For any biological system, evolutionists will say each “evolved.” This is their way of trying to explain in simple terms something that is too complicated and perfect to have been accidental and which, in fact, could not have arisen by blind chance.

Let's consider the cold-climate arthropod, *Ixodes scapularis* (blacklegged, or deer tick), which overwinters in the American Northeast and Upper Midwest. It possesses a special antifreeze glycoprotein, IAFGP, which adsorbs to the surface of intra- and extra-cellular ice crystals when temperatures drop below freezing. This restricts the growth of the ice crystals, preventing them from growing too large or in an un-organized fashion, protecting the tick's cells from being torn apart.

How did the ticks know they would need this antifreeze glycoprotein, and how



Female blacklegged tick, *Ixodes scapularis*. Image courtesy of Scott Bauer, USDA Agricultural Research Service, Bugwood.org.

did they get it? In fact, similar antifreeze proteins have been identified in over 55 species of terrestrial arthropods, including insects, spiders, mites, and centipedes.

What is more amazing is that one of the disease-causing bacteria that these ticks frequently transmit, *Anaplasma phagocytophilum*, actually possesses the ability to induce higher gene expression for an antifreeze glycoprotein, suggesting a mutualistic relationship for enhanced cold-temperature survival of each of the two species.

Such a beneficial interaction and the genetic coding necessary to assure a successful, specific, mutualistic relationship could not have developed accidentally over time. The existence of biological systems which feature interspecies mutual relationships lends credence the existence of a Creator.

Bibliography

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