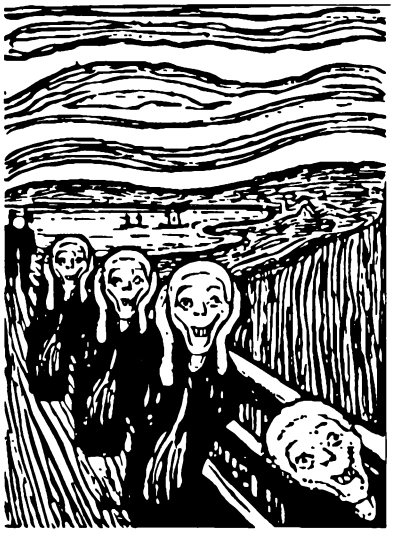


An exchange between readers and Gary Gilbert on genes and Genesis; and from Australia, more on Waco.

Common Pseudogenes Might Only Reflect the Genesis Curse

First, Dr. Gilbert assumes that the "silent majority" of human DNA ("98 percent . . . apparently silent") is indeed functionless (*Spectrum*, Vol. 22, No. 4). An argument from our ignorance about the purpose of 98 percent of the DNA molecule reminds one of early Darwinian arguments based on the so-called "vestigial organs" like the thymus, tonsils, or appendix, which were considered "useless" in the days of our immunologic naïveté. No ethical physician would today advise excision of these important tissues except in the case of disease. They are best seen as functional evidences of design, not "vestiges" of anything.

Second, even if this large pool of cellular code is truly inactivated, must we assume this is due to random decay or "genetic mistakes"? If man and lesser creatures were originally designed with common genetic molecules, then at the theological fall (which had obvious genetic consequences[1]), does not the biblical narrative suggest a catastrophic genetic alteration of life? Does it upset our cosmology to find humans and apes with common genetic malfunction as well as common function, without implication of descent?

Could not shared "pseudogenes" be simply a physical record of what the Bible calls "the curse"[2] imposed on humans and other life forms alike? The protective or self-healing capacity of DNA seems to have been impaired, allowing the presently observed random or episodic mutations to occur. But this should be confirmatory to and not contradictory of the biblical cosmology.

The Creator seems to have also allowed[3] a pan-species genetic alteration in the creation as a physical consequence of the moral decision to "know evil."

Along with Darwin I am free to speculate that a DNA created to be "very good" would have to be genetically altered, perhaps with large amounts "disabled." Dr. Gilbert's normal hemoglobin molecule (which unselfishly carries oxygen without using any for its own anaerobic metabolism), now has a dark shadow in sickle-hemoglobin that with a single genetic sin (one wrong nucleic acid in the DNA code of thousands for hemoglobin) deforms and painfully cripples its unhappy host under slight hypoxic provocation. (Perhaps the "inactive DNA" and "pseudogenes" of primates contain mechanisms that would have prevented this from happening in a sinless world?)

Jack Hoehn
Walla Walla, WA.

1. See Genesis 3: "you will crawl on your belly" NIV (i.e., genetic alterations of means of reptilian locomotion); "greatly increase

your pains in childbearing" (i.e., genetic alteration of pelvis, uterus, or its hormonal control); "produce thorns" (i.e., genetically altered branches); "and thistles" (i.e., genetically altered leaves); and so forth.

2. See Romans 8:19-22: "The creation waits . . . the creation was subjected to frustration (i.e., 98 percent of its genetic potential was put on hold?); "its bondage to decay" (i.e., it is now subject to random mutations and genetic mistakes not seen before the Fall?); "the whole creation has been groaning." . . . "waits in eager expectation for the sons of God to be revealed."

3. It can be debated if the Creator himself imposed "the curse," or allowed his fallen adversary (Satan) to inflict it on his creation. Scripture seems to present a Creator who takes responsibility for evil, although not himself evil.

If the Pseudogenes Are Neutral, Why Do All Chimps Have Them?

I am a physician, not a molecular geneticist. My question is this: If a pseudogene is perfectly evolutionarily neutral, why is it found in all the chimpanzees? Ignoring the random mutations present in the β hemoglobin pseudogene in both species, why should we not find some chimps with and some chimps without the pseudogene? The only explanation I have is that this pseudogene must have some advantage to the species, or it is, as Gary Gilbert said, "that chimps and humans share a common ancestor." If the common ancestor is part of the recent evolutionary tree we should be able to locate a "lower" species in which some have and some have not the pseudogene present. Another explanation is that this may actually support creation by a common author as as might be suggested by the example you gave of the *National Geographic* article about Columbus and his imperfect Latin.

I admire *Spectrum* and Gary Gilbert for having the courage to allow full investigation, as we as Seventh-day Adventists press on to a better understanding of truth in nature.

David Foote
Fort Ann, New York

Teleological Thought Isn't Enough

I read with interest Dr. Gary Gilbert's article, "In Search of Genesis and the Pseudogene" (*Spectrum*, Vol. 22, No. 4). Clearly, Dr. Gilbert's understanding of molecular biology is broad and impressive. He does a good job in explaining this complex field in terms a layman can understand.

In spite of the scientific sound of the article, however, Dr. Gilbert engages in a fair amount of unscientific thinking. He believes that the seeming "purposelessness" of pseudogenes that are nearly identical in chimps, gorillas, and humans argues against a special Genesis-style creation and supports a "common ancestry" of these species. To arrive at this conclusion, he uses a form of teleological thinking. The *American Heritage Dictionary of the English Language* (Boston: Houghton Mifflin Company, 1979) defines teleology as "the philosophical study of manifestations of design or purpose in natural processes or occurrences, under the belief that natural processes are not determined by mechanism but rather by their utility in an overall natural design." Dr. Gilbert uses a similar philosophical approach when he insists that a genetic design understandable to him must be present in order for a special creation to have occurred. When he doesn't see the design or purpose he thinks should be present, he concludes that macro-evolution provides the only reasonable explanation.

First, he insists that all facets of life on this planet must show design or purpose if creation occurred as in Genesis. Secondly, that design must be understandable to him and other scientists. The first assumption might be defensible in a perfect world; however, the same Genesis record that describes the creation of a perfect world also describes its degeneration with the Fall.

Second, what makes him think that nature ever speaks clearly? Nature offers clues, but often the clues are very subtle. A scientist must carefully observe and interpret these clues to determine their significance, just as a Bible scholar must carefully interpret the Scriptures to determine their meaning. Both disciplines require humility and an open mind.

Thomas W. Young
Stone Mountain, Georgia

Letters to the editor are always welcome, and will be considered for publication unless otherwise specified. Direct editorial correspondence to Spectrum, *P.O. Box 5330, Takoma Park, Maryland 20913 (U.S.A.). The editors reserve the right to condense letters prior to publication.*

Moondust, Jupiter, the Appendix: Where Is Scientific Humility?

In Dr. Gary Gilbert's article "In Search of Genesis and the Pseudogene" (*Spectrum*, Vol. 22, No. 4), we find such expressions as, "If God used the same plan for hemoglobin protein when he made cows and humans, then the hemoglobin proteins should be identical—or any difference between them should serve a purpose. . . ." and "if God, like a good engineer, had used a single genetic design for protein in different animals, then the quality control on his production line was poor." Who is he or anyone else to judge God's work on human terms or criticize his abilities as an "engineer"? Just because Dr. Gilbert and his colleagues do not know the function of what they are pleased to call "pseudogenes" and cannot discover it does not mean that there is none. It was not too long ago that we were informed that the human appendix had no function and was only an infection-prone nuisance. I don't believe that is the conventional scientific wisdom today. I recall reading in my public high school science book that Jupiter was a huge solid body covered with ice and liquid oxygen. I don't believe that is the conventional scientific wisdom today, either.

I still recall, in the run-up to the first moon landing in 1969, the worried discussions of what would happen to the moon lander and its occupants when they settled into that 18-foot layer of space dust that must cover the moon, given its great antiquity and the constant bombardment of dust striking its surface (let's face it; it would take only 0.000000054 inches per year over a period of 4,000,000,000 years to reach 18 feet). Yet to this day I have never seen an explanation of the presence of only an inch or two found by astronauts on that and subsequent landings.

One would have thought that the science community, in the wake of all the discoveries of the past half-century and all the "firm" theories that have been upset by these discoveries, would have learned some lessons in humility. One would think that Christians, those who, through the Gospels, have come to know Christianity's Founder, would at least learn humility from him. And one would think that Adventists especially would be willing to give God the benefit of the doubt.

Rodney H. Mill
Dighton, Kansas

Gary Gilbert Responds . . .

In response to Dr. Hoehn: The arguments Dr. Hoehn presents hinge on whether the pseudogene is really functionless. To prove that something is functionless is, perhaps, the most difficult proof. Imagine an alien from another planet asked you what a discarded soft drink can was for. You would probably tell him that the soft drink can was trash, without productive function in human society or nature. Your argument would be largely dependent upon your knowledge of the can's history. It had once functioned to hold a beverage, the beverage had been removed, and no further function remained. You might offer as further proof that you could remove it and there would be no adverse consequences. The argument about the pseudogene is similar to the argument for the useless soft drink can. It once functioned to code for hemoglobin, that function is gone, no apparent function has superseded the lost function, and humans who lack the pseudogene do not have a corresponding clinical abnormality. But the argument about the soft drink can is not absolute proof and neither is the argument about the pseudogene.

In response to Dr. Foote: Dr. Foote raises an interesting question. If the β hemoglobin pseudogene originated in a primate sector then what happened to the offspring of the brothers and sisters of that primate? Shouldn't they be all around us and lack the pseudogene? I am aware of three possible explanations for the pervasiveness of the pseudogene and many other silent genetic errors in living primates. If the population in which the β hemoglobin pseudogene arose was small—think of the bald eagle or the North American buffalo—a neutral mutation may have spread throughout the population by sheer chance. If the original mutation occurred in a larger population, then a reproductive or survival advantage must have been present within a few hundred thousand DNA units so that the pseudogene was *associated* with an advantageous gene. It would then eventually become prevalent within the population to approximately the same degree as the advantageous gene. This mechanism has been demonstrated in fruit flies. A third mechanism involves a flaw in genetic repair. The DNA repair machinery in each cell tries to make both chromosomes of the same type match. Under some circumstances it may favor duplication of the pseudogene and insertion into

the complimentary chromosome rather than elimination of the pseudogene. Although this would represent a flawed repair mechanism, this particular mistake would be minor, as it would have no negative consequences for the individual.

I believe Dr. Foote is correct in suggesting that the pseudogene could be interpreted as the unintended signature of an imperfect Author. I suspect, however, that most Adventists would object to this interpretation.

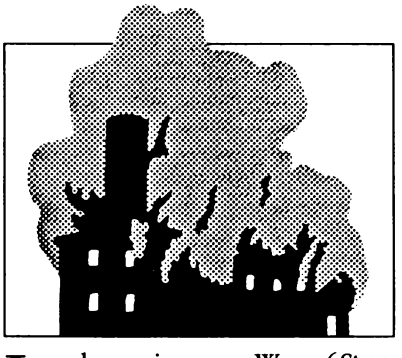
In response to Dr. Young: Invocation of a teleological explanation may indeed by cause for criticism in scientific writing, as Dr. Young notes. When talking about God and ultimate causes, however, discussion of teleology (defined as "the fact or the character of being . . . shaped . . . by the design of a divine Providence. . . . opposed to purely mechanical determinism or causation exclusively by what is temporally antecedent" by *Webster's Second International Dictionary*) becomes inescapable. The argument that a complex creation implies a clever designer impressed me as the strongest evidence for the existence of God during my college days. While this is a philosophical belief, not a scientific theory, it nonetheless implies specific predictions that may be compared to scientific data. Dr. Young objects to my stating those predictions as "unscientific," implying that there can be no relationship between religious philosophy and scientific thinking, and further, that religious philosophy lies outside the bounds of normal, careful thought. I disagree strongly; religious philosophy should be examined critically and informed by reality.

Adventists are fond of the term *holistic* and like to see themselves as architects of a philosophy that integrates body, mind, and spirit. But advanced education, which we prize, inevitably introduces ideas that our born-in-the-19th-century world view is unable to comprehend. You and I both have acquaintances who have abandoned Adventism for this reason and others who have developed a rift between intellectual life and spiritual life. My antidote to these outcomes is frequent critical evaluation of both Adventism and new scientific insights. I make the assumption that God is the friend of all truth. The open-endedness of this solution may seem unsatisfactory; if so, may I urge recognition of the limits of your insights as the standards by which mine should be judged.

In response to Mr. Mill: The comparison of God to a (human) designer responsible for engineering extremely complex machines—human beings—has been common in Christian writing for two centuries. My point was that the β hemoglobin pseudogene is a complex structure that is not explained by the common metaphor of God as engineer. It was not my intent to question God's capacity for good engineering, only the metaphor of God as engineer.

Gary Gilbert
West Roxbury, Virginia

Daniel & Revelation Committee Needs New Ideas



I read your issue on Waco (*Spectrum*, Vol. 23, No. 1) with more than normal interest, since Vernon Howell's cult also recruited followers here in Australia. In fact, I was one of Steve Schneider's most vocal failures, despite his charisma, enthusiasm, and superficial familiarity with many a scriptural detail. The soul searching in the section, "How Should SDAs Respond?" is most commendable. It is Ernest Bursey's courageous contribution on which I wish to focus.

In essence, Bursey pleads for dialogue within the church on interpreting the Book of Revelation. No doubt some fellow teachers of the books of Leviticus and Daniel, the Olivet Discourse, and the Epistle to the Hebrews would echo his sentiments in their own spheres of expertise.

On one hand, Bursey laments the standoff among the laity over Revelation Seminars. He might have underscored his point by adding that there are several somewhat disparate versions to choose from!

On the other hand, more importantly, Bursey rues the fact that the Daniel and Revelation Committee (DARCOM) series is less than representative of Adventist academic opinion. This is apparent even from the spread of views within the seven volumes, as well as DARCOM's admission that they included only a selection of submitted material.

The crucial point is that, after a full decade of costly labor, DARCOM has officially yielded virtually no opinion that it held at the outset. Yet these essays range from the sublime to the inadequate—some would say ridiculous. I have often rejoiced to see a competent scholar get right to the heart of the

Word, sometimes refuting the more unbridled assertions of Adventism's critics. At times, I have been driven to the Word to assess some fresh, promising insight. But sadly, all too often I have wept as Adventism's professional apologists reached their familiar goals in rather dubious circumstances—to put it kindly.

Despite DARCOM's invitation to study some issues further, especially in the Book of Revelation, Adventism must decide for itself whether its official journals ever open their pages to genuine dialogue, as Bursey suggests, or sanction some book with like intent. But I, for one, am not holding my breath. The temptation to consider this whole distasteful distraction closed will probably prove irresistible.

The narrow confines of *Spectrum* alone offer an adequate platform for critique. Right now we need a set of books, free of denominational restraints, to offer informed critiques of the more relevant material within the DARCOM series. No one scholar can meet this need. I am well advanced with a manuscript treating one crucial issue. My problem, however, from this rather remote theological outpost, is access to respectable publishers who are willing to accept such specialist projects.

Fred Mazzaferri
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