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What a Creationist Believes

by Wayne Frair, Ph.D.

Editor's note: This article is excerpted from Dr. Frair's book titled Science and Creation: An Introduction to Some Tough Issues*, 2002, available in the CRS Bookstore.*

The word "creation" comes from the Latin, and it means to produce. It is used in the sense of bringing something into existence, usually referring to God's activity. Creation is a clear and prominent biblical doctrine. The first verse of the Bible says, "In the beginning God created the heavens and the earth" (Genesis 1:1). Throughout the Bible there are hundreds of other passages referring to creation, so anyone believing the Bible must believe in creation! Creation includes the belief that at the beginning a supernatural God created nature which basically consists of matter and energy. The Christian position is that before this *only* God existed, so this infinite God created the matter/energy from *nothing*.

The creation included the various elements like hydrogen , oxygen, sodium, iron, and gold. God created stars like our sun, wherein radiant energy is produced when hydrogen atoms join by twos to form single helium atoms. Also, He created the earth, water, animals, plants, and our first parents. The Creator worked rapidly during the period of creation, and in six days He made many *kinds* (Hebrew *min*) of plants and animals separate from each other.

Laws of nature

Included in nature are the laws of thermodynamics, gravity, and biogenesis. Nature has operated according to these basic creation laws, but it has taken humans many years to discover them. For instance, the law of biogenesis was not well-recognized until the late l800's when it was realized that new organisms of any type come only by reproduction from other forms of that type.

Any moth comes specifically from the same type of parental moths. But just a few years ago some people still believed that

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Do Humans Have a Vestigial Nictitating Membrane?

by Jerry Bergman, Ph.D.

An excellent example of a commonly mislabeled vestigial organ is the so-called *nictitating membrane* remnant in the human eye. To nictitate means to move rapidly back and forth, in this case over the front of the eyeball. A functional nictitating membrane, often called a "third eyelid," is a very thin, muscle-controlled, transparent membrane that moves horizontally across the eye surface to clean, moisten, and protect the eye. The membrane is hinged at the inner side of the lower eyelid of many animals. The nictitating membrane is especially important in animals that inhabit certain environments. This includes those that live near the ground and are exposed to dust and dirt, such as birds, reptiles, and mammals, or marine animals such as fish.

Vestigial claims

Darwin (1871, p. 23) cited the nictitating membrane as important evidence of evolution, writing that it

> …is especially well developed in birds, and is of much functional importance to them, as it can be rapidly drawn across the whole eyeball. It is found in some reptiles and amphibians, and in certain fishes, as in sharks. It is fairly well developed in the two lower divisions of the mammalian series, namely, in the monotremata and marsupials, and in some few of the higher mammals, as in the walrus. But in man, the quadrumana [primates comprising apes and monkeys], and most other mammals, it exists, as is admitted by all anatomists, as a mere rudiment, called the semilunar fold.

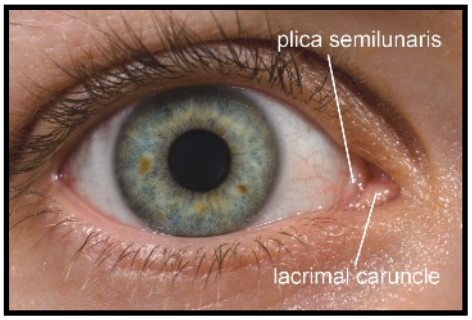

FIGURE 1. The plica semilunaris is a fully functional structure of the human eye and thus is not a useless vestigial remnant of the nictitating membrane which is found in many animals.

Wiedersheim (1895, p. 148) correctly termed this structure in humans the *plica semilunaris*, but incorrectly concluded that it "corresponds with the third eyelid, the so-called nictitating membrane of the lower animals." He then erroneously concluded (1895, p. 148) that "this third eyelid has undergone great degeneration" in humans. Haeckel went into more detail (1876, p. 437), describing it as a "remarkable little crescent-shaped fold, which is of no use to us, and is of interest only as being the last vestige of the nictitating membrane; of that third inner eyelid which is still of great physiological importance in Sharks and

... continued on p. 2

many Amnion Animals."

This membrane has long been incorrectly interpreted as a useless vestigial structure. Based on the evolutionary view that blacks are less evolved than whites, Robinson (1899, p. 1213) concluded that in many Negroes the membrane contains a small cartilage plate that "represents the third eyelid, or nictitating membrane, of birds, many reptiles, and some amphibians."

Thomson bluntly concluded (1958, p. 204) that there is "no doubt" that this fold "which anyone can see in the looking-glass" is "a dwindled relic of the third eyelid which is present in most mammals." Other examples are easily found in the older literature—see for example Drummond (1903), Parker (1928), Baitsell (1929), and Lull (1932).

This structure is still widely listed as a vestigial organ that documents evolution. Storer and Usinger erroneously claimed (1977, p. 208) that in the "inner angle of the human eye is a whitish membrane representing the transparent nictitating membrane." Strickberger, in his leading evolution textbook (2000, pp. 39–40), included it in a list of vestigial organs in humans. Another of the many examples is a relatively recent biology textbook that listed the nictitating membrane as vestigial (Tewari and Vishwanathan, 2009, p. 88). One popular web site even lists it as one of the top ten vestigial organs in the human body (Anonymous, 2013).

Nictitating membrane in animals

The claim that the plica semilunaris is an evolutionary leftover of the nictitating membrane is based on the observation that many lower animals possess it, and higher animals lack it. The problems with the position that it was lost as animals evolved include the lack of a clear evolutionary trend of its loss among animals. Many higher mammals, including sheep, rabbits, horses, deer, beavers, cats, dogs, cows, and elephants have a fully functional nictitating membrane, and others, including most primates and humans, do not (Sodera, 2003, p. 288).

It exists in blue and Hammerhead sharks, yet not in bony fishes and some amphibians. Birds, including owls, chickens, raptors and many birds of prey, and some non-birds such as frogs, some sharks, and most lizards and crocodilians also have nictitating membranes. Nictitating membranes are actually present in most terrestrial vertebrates with the exception of some carnivores and primates.

Long ago the nictitating membrane was carefully studied in birds, which led to the finding that it requires a complex "highly-specialized neuromuscular mechanism" to function (Stibbe, 1928, p. 160). The membrane rapidly sweeps across the eye at frequent intervals, negating the need to close the eyelids. This allows full vision while flying—closing the eyelid while traveling 50 to 60 mph could be fatal when flying low in cities or forests.

In view of its importance in cleaning and protecting the eye, the nictitating membrane would appear to be a great advantage for all animals and humans, in both air and water environments. No explanation exists as to why it would be selected against in humans.

Plica in humans

Although it is often considered to be homologous with the "third eyelid" of many animals, the plica is neither a nictitating membrane nor homologous with it. Anatomically, it is a narrow, half-moon-shaped vertical fold of conjunctiva tissue. According to Wolff (1976, p. 220), its pink color

> …is due to its vascularity and contrasts with the white of the sclera. In structure it is like that of the rest of the bulbar conjunctiva, but the epithelium, instead of the six layers, consists of eight to ten, and the deepest layer, instead of being cubical, is cylindrical, and contains a lobule of fat and some nonstriated muscle supplied by the sympathetic [nerve]. Goblet cells are particularly numerous.

The classic eye anatomy textbook by Snell and Lemp (1989, p. 100) accurately described the misnamed nictitating membrane as a semilunar fold of the conjunctiva.

In addition, the plica in humans is served by different nerves than is the animal nictitating membrane, which is innervated by the abducens nerve (King, 1979). Nor is

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the developmental history, structure, and innervation homologous with the nictitating membrane (Weichert, 1970, p. 419). The plica semilunaris in humans has only non-striated muscles, in contrast to the striated muscles of the nictitating membrane in animals (Bloom and Fawcett, 1975; Parker, 1928, p. 42). Also, a secretory epithelium system called the Harderian glass is associated with the nictitating membrane, but not with the plica (Chiquoine, 1958).

The plica's function

Although the nictitating membrane and the plica semilunaris have minor overlapping functions, the plica is fully functional in humans (Scadding, 1983, p. 6). The human plica serves both as a support and control structure for the eye, as well as for lubrication to insure effective eyeball movement. Furthermore, "the fold intercepts foreign bodies on the cornea and passes them to the region of the lacrimal caruncle," the part of the eye closest to the nose (Gardner, et al., 1975, p. 641).

Another important function of the plica is to secrete mucin, one of the three components that make up tear film. For this reason, the plica is covered with goblet cells, that secrete mucin, which aids in both cleansing and lubrication of the eyeball (Scadding, 1983, p. 6; Wolff, 1976, p. 221). The semilunar fold portion of the conjunctiva is located at the medial corner of the eye. Without the plica semilunaris, comfortable vision would be considerably more difficult.

Although not required for survival, the plica significantly increases the field of vision possible without moving the head (King, 1979). The eye has about 50 to 55 percent rotation, and without the plica semilunaris the rotation would be considerably reduced. The reason is that it takes up the slack that occurs when the eye looks forward or medially. No such arrangement exists laterally because the fornix (arch-like opening) in this area is very deep (Wolff, 1976, p. 221). Because the plica allows generous eye rotation, it actually is an example of over-design.

Another function of the plica semilunaris is to collect foreign material that adheres to the eyeball surface. To do this, it secretes a thick, sticky, fatty liquid that effectively collects foreign material and, in essence, isolates the material for easy removal from the eye without scratching the eyeball surface. The role of the plica in clearing foreign objects from the eye surface has been recognized as critical since at least 1928. Stibbe (1928, pp. 169–170) noted that on a windy day the eyes can rapidly accumulate dust, but they can usually successfully remove it. He explains that this process involves the dust collecting

> …into a little sticky mass at the inner canthus; and that mass is situated on the skin, in the angle internal to the caruncula lachrymalis, in which situation it causes no irritation ... this is brought about by the intervention of the plica semilunaris.

He added that, if the eye is kept open when a foreign body is on the eye surface, the eyeball will repeatedly turn inward in an effort to allow the foreign body to be removed.

Conclusions

Clearly, the plica is not a nictitating membrane, and does not nictitate (Stibbe, 1928, p. 164). For this reason, it "does not correspond to the nictitating membrane" of various animal species (Gardner, et al., 1975, p. 641). Research has confirmed that the misnamed nictitating membrane in humans is actually a plica semilunaris that has several critical functions. Thus, it is not a degenerative vestigial organ as has been long claimed by evolutionists. In my opinion these evolutionary suppositions have misled researchers and likely delayed our understanding of this important structure.

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Creationist Beliefs

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fur coats actually could turn into moths. Although an observation of a coat in the closet might seem to support this conclusion, careful scientific studies have showed that adult moths laid eggs which hatched to become the larvae found eating the coat. A larva pupated, and at the appropriate time out came a moth which was like the parent which laid the original egg. This is just one of countless examples clearly demonstrating that every life form reproduces a similar life form—this concept being called the "law of biogenesis."

So God created nature with its laws, but the Bible also indicates that God still is involved, sustaining the universe He created. The supervisor of a factory does not just let the machinery run by itself. He carefully watches and controls every aspect of the operation so that it will continue to function efficiently.

However, if the workers do not perform their duties well, things can go wrong. For example, people have polluted their environments. Possibly, God may have allowed this to teach us some important lessons. In the grandest way God still is in constant control of the nature He created, and we as God's servants (based upon the best scientific knowledge) need to be responsible regarding environmental concerns. Even though God has authority over all aspects of nature, He has assigned to humans the jurisdiction over life on this planet (Genesis 1:26–29), this being a responsibility which individuals and their societies have not always accepted.[1]

The God of the Bible is represented as all powerful (omnipotent), knowing everything (omniscient), and being everywhere at the same time (omnipresent).

Miracles

Even though all of nature was created by God, nature is not the same as God. Nature consists of matter/energy, but God who is spirit (John 4:24) is *super*natural. This is the clear Biblical picture. However, there have been times when the Lord has chosen to act in ways that appear contrary to our human understanding of the laws of nature. These acts we term miracles, and they occurred, for example, when God made a dry path for the army of Israel to pass through the Red Sea with a wall of water on each side (Exodus 14:22).

Jesus Christ fed five thousand men starting with only five loaves of bread and two fishes (Luke 9:13–17). Where did He get the additional bread and fishes? We think the best understanding of this Biblical account is that Jesus Christ created them. He as Creator-God had the privilege of performing this miracle in order to demonstrate His own power. Jesus Christ was completely God and completely human at the same time. So this provision for the hungry people was motivated by His desire that God, not man, should receive the glory, and that people should believe in Him.

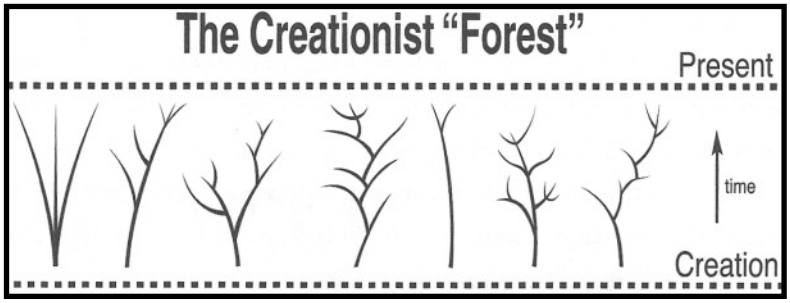

FIGURE 1. Each of the trees illustrates a kind or type and shows the variation or diversification which has occurred since the original creation. A species, whether it is living or extinct, would be at the tip of a branch. Many factors including genetic and environmental would influence survival of the various species.

Types (Kinds)

So all creationists today believe that a supernatural God created living organisms. My understanding and that of other creation scientists is that God created the different types of plants and animals, and none of these separate types physically is related to any other types. There have been limited changes within the types (as for humans, dogs, or cats) but not crosses between the types. This typology (or limited change) view is modeled as a forest of trees (each tree representing a type). The trees lack roots because each type or kind started separately at its time of creation. Figure 1 shows a diagram of this model.

This view fits with what God reveals in Genesis 1 and 2. Also scientifically we observe that there are gaps between different types in the fossil record and among living types today. Many organisms appear abruptly as fossils in the rocks. The best example is in sedimentary rocks geologists call the Cambrian. This abrupt appearance and the universal gaps in the fossil record strongly suggest that God created separate kinds.

Many scientists have acknowledged the statistical impossibility of life's originating and even evolving by chance processes without the activity of God. The late Carl Sagan was an ardent evolutionist and anti-creationist, but he was aware of difficulties associated with his evolutionary beliefs. Starting with building blocks (nucleotides) of DNA he said, "a rough estimate of the genetic unlikelihood of a given human being" is roughly one chance in $10^{2,000,000,000}$ (that is, one chance out of 1 followed by two billion zeros).[2] For him the answer was darwinism, but based upon available facts creationists theorize that the human kind originated separately from all other types.

So creation-scientists affirm that their theory is superior to an evolutionary theory because the facts collected in a study of nature are more consistent with this creationist view.

Notes and references

1. Pollution occurs because of one of the following factors: ignorance, inertia, or irresponsibility. See Frair, W. 1969. Ignorance, inertia, or irresponsibility. *J. of the American Scientific Affiliation* 21(2):43–44.

2. Sagan, C. 1973. Extraterrestrial life. p. 46 in Sagan, C., ed., *Communications with Extraterrestrial Intelligence*. MIT Press, Cambridge, MA.

Math Matters
by
Don DeYoung, PhD

A Remarkable Mathematician

Maria Gaetana Agnesi (an·YAY·zee, 1718–1799) was one of the most extraordinary scholars of all time. By the age of nine this girl from Milan, Italy had mastered seven languages including Latin, Greek, and Hebrew. The child prodigy was known to her friends as the "seven-tongued orator." At a typical house gathering, thirty scholars from several nations sat in a circle and questioned Maria on various technical topics. She was just 13 years old at the time (Osen, 1974, p. 40).

The oldest of 21 children, Maria followed her father into the world of mathematics. Her life overlapped that of Isaac Newton (1642–1726) by eight years. At this early stage of calculus development, Maria extended the understanding of analytic geometry, infinite series, and differential equations. While tutoring her siblings, she wrote a thousand pages of mathematics text. This collection was published in 1748 as *Analytical Institutions* in two large volumes, and was one of the earliest calculus compilations.

One particular geometric curve was of special interest to Maria. An algebraic expression of the curve is $y = c^3/(x^2 + c^2)$ where c is a constant. Some years later, a mistranslation of Maria's published work resulted in the curve being given the odd name "Witch of Agnesi." There are several modern applications of this curve. For example, the shape describes the width of spectral lines in optics, and power dissipation in resonant circuits. The curve also resembles the cross section of a single water wave at sea. Again and again in mathematics, an earlier-studied function finds later physical applications in nature. Each occurrence gives testimony that mathematics is the language of creation, including a host of specialized math functions (DeYoung, 2006).

Maria's gender prevented her from honored membership in the mathematical societies of her day. This was of little concern to her as her conservative Catholic faith matured and strengthened over the years. Around age 45 Maria began to devote her time to helping the sick and poor. She took charge of a local hospital and became known as "an angel of consolation." Her home itself became a refuge for poor, ill, and infirm women. Upon her death at age 81 Maria was buried alongside some of the patients she had cared for. This dear woman combined an outstanding mathematics career, far ahead of her time, with a life of sacrificial Christian service to others.

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...without excuse!

The Testimony of "Orgel's Gap," Part 2

by Timothy R. Stout

In the previous issue of *Creation Matters* (Stout, 2014), we looked at the final journal article of Leslie Orgel (1927-2007). It was published posthumously with the title "The Implausibility of Metabolic Cycles on the Prebiotic Earth" (Orgel, 2008). The article concluded with a statement that there is a gap between the complex chemical mixtures produced by prebiotic processes and the reasonably pure input polymers which are required for the subsequent steps of abiogenesis. No solution to the origin-of-life problem would be possible until this gap is closed.

Orgel's article also made possible other significant observations. First, the title itself, *The Implausibility of Metabolic Cycles on the Prebiotic Earth*, is significant. Metabolic cycles are critical to the existence of physical life. Yet, the title acknowledges that current scientific knowledge teaches against a natural appearance of these cycles.

Enzymes required

Secondly, information-based enzymes are capable of performing intricate chemical processes, both synthetic and degrading. However, they would not have been available in early prebiotic stages. Without the necessary enzymes, chemical reactions do not have the required specificity. If a step in the cycle has too complex an output, the lack of an appropriate enzyme results in too much product being diverted out of the cycle, rendering the cycle ineffective.

Additionally, enzymes can distinguish between two very similar chemicals, operating on one and not the other. Simpler chemicals, such as those produced in origin-of-life experiments, cannot do this — rather, they participate in what Orgel calls "side reactions." Orgel stated that this problem had been pretty much overlooked by others in the field, but was perhaps an even greater obstacle than having too complex a product output. In his words,

> Lack of specificity rather than inadequate efficiency may be the predominant barrier to the existence of complex autocatalytic cycles of almost any kind.

Since Orgel concluded that the gap between complex outputs and subsequently required input purities had the potential to make abiogenesis impossible, then the issue of side reactions becomes truly serious. It potentially makes abiogenesis even "more" impossible.

Metabolic networks

Actually, problems related to prebiotic metabolic cycles are even far more reaching than Orgel presented. A metabolic cycle is a standalone process; it does not represent life. It is merely a component in what is called the *metabolic network*, an interconnected system of chemical reactions which provides the mechanism for cellular metabolism. [1]

As an illustration of metabolic pathways, a typical cell can use the Krebs cycle to burn sugars, starches, proteins, and fatty acids as fuel sources. In the process, the fuels are converted into water, carbon dioxide, and ATP; the ATP is used by cellular processes as little packets of energy. However, the fuels cannot be used directly by the Krebs cycle.

Long pathways are required to transform these various chemicals into the specific molecules that can be fed into a step of the cycle. Without an associated pathway, a particular kind of fuel source cannot be used by the cell as a source of energy. So, both a fuel source conversion pathway *and* the Krebs cycle itself must be available simultaneously in order to manufacture ATP, the goal of the process.

Orgel was concerned about the difficulties of implementing metabolic cycles. Yet, these cycles represent only a small portion of the metabolic network. A living cell requires the major portion of the entire network to be functionally available from the beginning. This greatly increases the scope of the difficulties facing abiogenesis.

It is as though Orgel was saying the problems associated with climbing over a certain little hill seemed insurmountable when the actual task was to climb to the other side of Mount Everest in a single effort. Yet, Orgel and others appear to remain committed to abiogenesis despite the number and seriousness of the problems facing it. How does one explain this?

I believe the answer is found in the Bible. The issue is not intellectual—it is spiritual. In 2 Thessalonians 2:10–12 (NKJV) we read,

> …They did not receive the love of the truth...for this reason God will send them strong delusion, that they should believe the lie, that they all may be condemned who did not believe the truth but had pleasure in unrighteousness.

God gives each person clear evidence of His person, and that He is the Creator (Romans 1:18–22). A person who deliberately suppresses this truth risks judgmental delusion. God can give him over to believe the things he wants to believe. However, this delusion can result in eternal condemnation. From Romans 1, God considers a person "without excuse" who goes this path.

The problems are clear

Orgel clearly saw the problems facing abiogenesis. However, he refused to understand their significance; viz., that they provide a basis for believing that a living God is the Author of life. May his blindness be a warning to us not to suppress the truth of God, lest we too follow the example of him and others like him.

This warning is particularly relevant for many Christians today, who are willing to compromise on the accuracy, authority, and literalness of the book of Genesis. God gives ample reason to support the validity of His Word. The person who rejects what God has said opens himself up to judgmental delusion. God gives him over to believe what he wants to believe. Because of this, the person who intends to compromise just a little, such as with theistic evolution, risks ultimately denying much more than he ever intended.

There is a certain pattern repeated throughout Scripture: God is impressed with and pleased with those who believe what He says. He is not interested in the excuses of those who won't. May it be the desire of our hearts to be among those with whom He is pleased!

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[1] See Kraulis, P. 2001. Lecture notes: *What are Metabolic Networks?* www.avatar.se/strbio2001/metabolic/what.html

Matters of Fact

by

Jean K. Lightner, DVM, MS

Human Genomic Data Support Creation

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 Is there genomic evidence that we did not descend from apes millions of years ago?

A Yes, there are multiple lines of genomic evidence that apes and humans do not share a common ancestor and that humans have not been on the earth for millions of years.

Human-chimp overall similarity

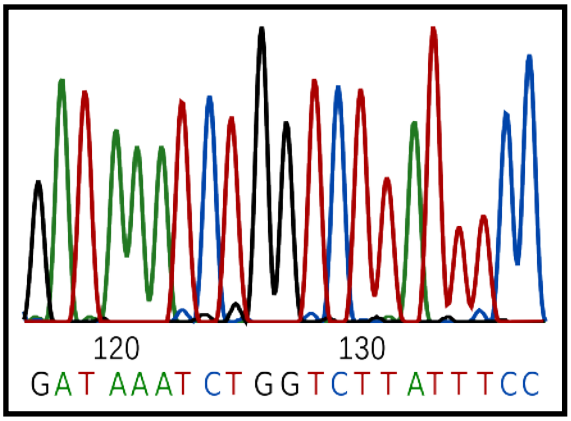
Early comparisons of the similarity between human and chimp DNA did not directly compare the entire DNA sequences. Our modern technology was not as well advanced at that time. Instead, initial estimates of 98–99% similarity were based on experiments using reassociation kinetics. Essentially, small fragments of DNA are separated into two single strands, and then are allowed to reassociate with similarly-separated DNA from comparable regions of the DNA of a different species. It is a useful technique to provide an indirect estimate of similarity, but only for those regions selected.

These similarity estimates were based on regions of DNA where humans and chimps were already known to be similar. Those wishing to promote the idea of common ancestry jumped on these results and presumptuously paraded these high similarity figures as if they represented an accurate measure of overall similarity. They insisted that this high degree of similarity proved common ancestry between humans and chimps (Tomkins and Bergman, 2012). Of course the problem for the evolutionist is that humans and chimps are really only about 70% similar, as determined by more holistic methods of comparison (Tomkins, 2013a). Evolutionists have no reasonable explanation for how these two species could have diverged so dramatically, even in their time frame of millions of years.

So-called "junk" DNA

The problem of accounting for the differences between humans and chimps was recognized by evolutionists decades ago, even while the promoters of evolution were trumpeting the inflated human-chimp similarity figures. Given the relatively long generation times for humans and chimps, there are mathematically too many genomic differences for natural selection to have been able to produce the pattern of dissimilarity within the assumed evolutionary timeframe.

So, the idea of neutral evolution was developed. In this model, most DNA has no function and is selectively neutral. Change can occur randomly by genetic drift.



DNA sequencing trace. (public domain) http://commons.wikimedia.org/wiki/File:DNA_sequence.svg

It appeared to be a mathematically plausible explanation — until it was found that "junk" DNA actually has important regulatory functions. If junk DNA isn't really junk, then neutral theory collapses (Carter, 2009). Documented examples of function associated with this non-protein coding DNA continue to increase (Purdom, 2012; Tomkins, 2013b; Ayarpadikannan and Kim, 2014).

Human chromosome 2

Evolutionists proposed that human chromosome 2 was the result of a fusion of two ancestral chromosomes that remained separate in other primates. This idea was once paraded as powerful evidence for evolution (Lightner, 2014). In fact, according to Dr. Ken Miller, if there is no evidence for a fusion, then evolutionary theory would be falsified. Investigation of the inferred fusion site indicates that it is not the result of a fusion. It has striking differences compared to the ends of the primate chromosomes from which evolutionists thought it came, and rather than being "junk, it actually codes for an important region within a functional gene (Tomkins, 2013c). If Miller's aforementioned comments are taken seriously, then common ancestry between human and chimps has now been falsified.

Human accelerated regions

There are regions of the human genome, termed human accelerated regions (HARs), that are quite different from those of other mammals. Evolutionists, in keeping with their paradigm, say that these regions were conserved during evolutionary history and, since the time that humans diverged from chimps, there has been a sudden burst of changes in the human lineage (Hubisz and Pollard, 2014). The fact that these regions have "remained" very similar in most mammals suggests to evolutionists that they carry out important functions.[1] If so, then how did they suddenly change so rapidly early in the human lineage?

Studies of ancient DNA from Neanderthals and Denisovians show that they, too, had these systematic differences from the chimp sequence (Burbano et al., 2012). There was some variability between the ancient and modern humans, which may be indicative of new alleles that actually did arise since the creation of man. However, some caution needs to be taken with ancient DNA, as it is possible that some of the differences between the sequences are actually the result of errors in determining the sequence (Criswell, 2009).

The function of most HARs is unknown and most are not within protein coding genes. A recent study predicts that 30% or more function as developmental

[1] Within a creation paradigm, most DNA would be considered to have some kind of important function, whether the sequence remained the same or not.

enhancers (Capra et al., 2013). As such, proper function would be expected to be critical for humans to survive and reproduce. While evolutionists are attempting to explain ways these sequences may have changed so rapidly, none of them considers the effect that the intermediate sequences may have had on viability.

Observed mutation rates in mtDNA compared to diversity

Secular scientists have used the molecular clock hypothesis to try to estimate how long ago various species diverged. In the process, mutation rates are often calculated based on the assumption of common ancestry rather than on direct observation. So the method does not show actual common ancestry; instead it assumes it.

Jeanson of ICR used this method to calculate how long humans and several invertebrates have been on the earth. However, rather than assumptions he used the actual observed rates of mutation and observed diversity. In each case, the result was consistent with a biblical age of the earth. If humans were really around for as long as evolutionists claim, there should be a lot more diversity in our mitochondrial DNA (Jeanson, 2014).

Most variation in human genes is very recent

Analysis of protein-coding regions from over 6500 people indicates that the vast majority of variation in these regions of the human population is rare and of very recent origin. Even though the results were interpreted within the evolutionary paradigm, the bulk of the variation was estimated to have arisen in the last 5,000–10,000 years (Tennessen et al., 2012; Fu et al., 2013). If the evolutionary assumptions are removed, these data are consistent with this variation arising in the post-Flood period of human history.

There were a few interesting patterns in this variation. Diversity was highest in genes related to immune function and olfactory receptors. Interestingly, these regions are variable in other species as well. These genes play a role in allowing creatures to interface with their environment. It appears these genes may have been designed to diversify or change to allow for adaptation (Lightner, 2009). Diversity was lowest in pathways involved in basic cellular processes (Tennessen et al, 2012).

Summary

Since genomic data are usually explained within the evolutionary paradigm, most people are unaware that much of it poses serious problems to the evolutionary model. There is considerable evidence indicating that the genome was designed, that man was created separately from animals, and that creation was recent, all of which is consistent with the biblical history and timeframe.

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Errata Volume 19 No. 5

In the article titled *Carbon 14 Is Now the Creationist's Friend*, by D. Russell Humphreys, a typographical error occurred in Table 1. The correct carbon-12 content of the atmosphere today is 98.9%, not 99.9%.

Additionally, the URLs included for references 18 through 21, and reference 24 of the same article are no longer valid. The references with the correct links are provided below.

18. Andrew Snelling, Radioactive 'dating' in conflict, *Creation* **20**(1):24–27 (December 1997). http://creation.com/radioactive-dating-in-conflict

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20. Andrew Snelling, Dating dilemma: Fossil wood in 'ancient' sandstone, *Creation* **21**(3):39–41 (June 1999). http://creation.com/dating-dilemma-fossil-wood-in-ancient-sandstone

21. Andrew Snelling, Conflicting 'ages' of Tertiary basalt and contained fossilised wood, Crinum, Central Queensland, Australia, *Journal of Creation* **14**(2):99–122 (August 2000). http://creation.com/images/pdfs/tj/j14_2/j14_2_99-122.pdf

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NOTE: These corrections have been made to the online version.

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, editor of "Creation-Evolution Headlines" at http://crev.info. Opinions expressed herein are his. Unless otherwise noted, emphasis is added in all quotes.

Viruses May Do the Ocean Good

A new study shows that viruses can help keep down algal blooms. The ocean is full of viruses: up to 10 billion per liter, according to a recent *PNAS* article.[1] Scientists have barely begun to explore their roles in marine biology. Since they are so good at disrupting cells, they can put that skill to beneficial purposes in the right environments.

In the paper, Katie Bidle attempts to begin "**Elucidating marine virus ecology** through a unified heartbeat," i.e., by "using ribonucleotide reductases (RNRs) from virus metagenomes as a unifying molecular marker to not only characterize the diversity of resident viruses in distinct marine environments, but to infer their ecological strategies (e.g., specialists vs. generalists) across environmental gradients."

One ecological strategy appears to be beneficial. As many know from news, when algal blooms create the infamous "red tide," fish can become infected and die, and the water is spoiled for humans until the red tide disappears. But what makes it disappear?

A new study published in *Current Biology* shows that "**Zooplankton May Serve as Transmission Vectors for Viruses Infecting Algal Blooms in the Ocean**."[2] Specifically, tiny copepods, components of plankton, are carriers of a virus named *E. huxleyi.* Their feces carry the viruses, which then infect the algae that cause toxic blooms. "We propose that zooplankton, swimming through topographically adjacent phytoplankton micropatches and migrating daily over large areas across physically separated water masses, can serve as viral vectors, **boosting host-virus contact rates** and **potentially accelerating the demise of large-scale phytoplankton blooms**," they found.

1. Bidle, K.D. 2014. Elucidating marine virus ecology through a unified heartbeat. *PNAS* 111(44)15606–15607.
2. Frada, M.J., D. Schatz, V. Farstey, J.E. Ossolinski, H. Sabanay, S. Ben-Dor, and A. Vardi. 2014. Zooplankton may serve as transmission vectors for viruses infecting algal blooms in the ocean. *Current Biology* 24(21):2592–2597.

Plant Intranet Seen in Action

How do roots respond to what the top of the plant experiences? With an elaborate communication system resembling email. The authors of a paper in *Science* Magazine don't use the words *email* or *intranet*, but the signaling system they describe fits that description:

> Nitrogen (N) is a critical nutrient for plants but is often distributed unevenly in the soil. **Plants therefore have evolved a systemic mechanism** by which N starvation on one side of the root system leads to a compensatory and increased nitrate uptake on the other side. **Here, we study the molecular systems that support perception of N and the long-distance signaling needed** to alter root development. Rootlets starved of N **secrete small peptides** that are **translocated** to the **shoot** and **received** by two leucine-rich repeat **receptor** kinases (LRR-RKs). *Arabidopsis* plants deficient in this pathway show growth retardation accompanied with N-deficiency symptoms. **Thus, signaling from the root to the shoot helps the plant adapt to fluctuations in local N availability.**[1]

These small peptides, in other words, provide information sent from the roots to the growing shoots at the top of the plant. But that's not all; the shoot responds to its email with a message back down to the roots. Bisseling and Scheres describe this communication network in a Perspective article in *Science*:

> Therefore, plants integrate **local and global nutrient cues** to spend resources efficiently. On page 343 in this issue, Tabata *et al.* (*1*) identify **a peptide signaling mechanism** by which the **root locally senses N limitation in the soil, and communicates with the shoot, which then signals back to the root** to **stimulate lateral root growth** in regions with a high nitrate content to facilitate nitrate uptake.[2]

The system presupposes that cells in the shoot can "read" the peptide, understand it, and respond appropriately. Ditto for the reader down underground.

Scientists cannot yet "read" the email messages. "The **nature of the signal** from the shoot that **triggers** lateral root foraging behavior in the +N compartment **remains to be resolved**," Bisseling and Scheres state. But like watching two parties communicate in a foreign language and then respond with actions, the scientists can tell that communication is occurring. It's not sentient communication, as with human verbal communication. It's more like computer language: preprogrammed, digital, and responsive. A designer would look at this and say, "Aha!"

> **From an engineering perspective, it makes perfect sense** to decide centrally (in the shoot) whether the overall nutrient status is adequate, and then **send systemic signals** to stimulate growth everywhere except where the local inhibition system is active.

The Japanese team provides more evidence of an intranet. The system looks like one office communicating both with itself and with distant departments of the company:

> Nitrate uptake **systems** are under **control by both cell-autonomous local signaling** triggered by nitrate itself **and systemic long-distance signaling** that transduces external and internal N status **across spatially distant root compartments**.

By blocking the return email, the researchers figured they could learn whether the signals are necessary. Indeed, they were. By mutating the CEP gene that codes the emails, the plants became nitrogen starved. "These phenotypic and transcriptional analyses suggest that CEP signaling is likely to underlie N starvation responses and, accordingly, its overactivation or blockage leads to pleiotropic developmental effects in both roots and shoots."

This is another example of intra-plant communication that has been coming to light over the last few decades. "Small molecules such as secreted **peptides** can **mediate long-distance signaling**," the authors say. The peptide messages, moreover, are preprogrammed in DNA: "The **genes** that **encode** small peptide **signals** are often parts of **large families of genes** with overlapping and redundant **functions**."

Although they tested their hypothesis with a lab plant, the system they described is operative throughout the plant world. This means that a needle on a giant redwood hundreds of feet in the sky is capable of communicating, in principle, with its roots underground. A plant may not be able to walk around, but its intranet and email system gives it a sophisticated way to respond to changing conditions in a holistic way:

> **Plants, as sessile organisms, continuously face a complex array** of environmental fluctuations and **have evolved sophisticated responses** to cope with them. Given that CEP family peptides are **conserved** throughout vascular plants except for ferns, **peptide-mediated root-to-shoot-to-root long-distance signaling** is likely to be **a general strategy employed by all higher plants for environmental adaptation.**

It seems odd to claim that plants "**have evolved sophisticated responses**," given that the peptides they studied "are **conserved**" (i.e., unevolved) throughout the plant kingdom. The researchers never got around to explaining how this evolution happened. Would a blind, unguided process produce a "sophisticated" anything, especially one that is functionally effective and information-rich?

1. Tabata, R., K. Sumida, T. Yoshii, K. Ohyama, H. Shinohara, and Y. Matsubayashi. 2014. Perception of root-derived peptides by shoot LRR-RK mediates systemic N-demand signaling. *Science* 346(6207)343–346.

2. Bisseling, T. and B. Scheres. 2014. Nutrient computation for root architecture. *Science* 346(6207):300–301.

Canyons on Earth, Mars Reinterpreted as Flood-Caused

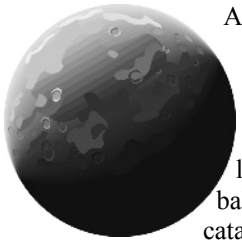
Catastrophic floods formed canyons long thought to have been formed by slow, gradual processes.

On Earth

The Atacama Desert is one of the driest places on Earth today, but it was the scene of catastrophic floods in the past. A new paper in *Icarus*[1] (the leading solar system journal) takes a look at amphitheater-headed canyons in the Chilean desert. Previously, they were explained by sapping, the failure of cliffs due to springs. Finding a flood model more appropriate, the geologists extend their finding to the planet Mars:

> **Understanding planetary landforms**, including the theater-headed valleys (box canyons) of Mars, usually **depends on interpreting geological processes** from remote-sensing data without ground-based corroboration. Here we investigate the origin and development of **two Mars-analog theater-headed valleys in the hyperarid Atacama Desert** of northern Chile. **Previous workers attributed these valleys to groundwater sapping** based on remote imaging, topography, and publications on the local geology. We evaluate groundwater sapping and **alternative hypotheses using field observations** of characteristic features, strength measurements of strata exposed in headscarps, and **estimates of ephemeral flood discharges** within the valleys… **Flood discharge estimates of cubic meters to tens of cubic meters per second**, derived using the Manning equation, are **consistent** with the size of transported clasts and show that the **ephemeral streams are geomorphically effective, even in the modern hyperarid climate**. We interpret that headscarp retreat in the Quebrada de Quisma is due to **ephemeral flood erosion** of weak Miocene epiclastic strata beneath a strong welded tuff, with erosion of the tuff facilitated by vertical jointing.

On Mars



A separate paper in *Icarus*[2] re-evaluated "some of the largest channels in the Solar System" that have been the subject of intense interest since the 1970s. Some of the narrow canyons in the southern circum-Chryse area have landforms in the 10-meter to 100-meter (football field size) range. Previous studies proposed catastrophic floods, lava flows, debris flows and even glaciers. Dates assumed for the canyons were in the 3-billion-year range. The new study not only weighs in favor of catastrophic floods, but re-dates them far more recent:

> These terrains include landforms consistent in shape, dimension and overall assemblage to those **produced by catastrophic floods**, and at one location, to **glacial** morphologies. Impact **crater statistics** for four of these surfaces, located within upstream, midstream and downstream outflow channel surfaces, yield an **age estimate of ~600 myr**. This **suggests** that the southern circum-Chryse outflow channels were **locally resurfaced by some of the most recent catastrophic floods on the planet**, and that **these floods coexisted within regional glacier environments as recently** as during the Middle Amazonian.

Dating a Martian (Surface)

Sun: There are other indications Mars cannot be even as old as 600 million years. For one, Mars is subjected to coronal mass ejections without the protection of a global magnetic field. *PhysOrg* discussed how the sun could have eroded the Martian atmosphere over hundreds of millions of years — far less than the billions assumed — yet a thicker atmosphere is necessary to account for surface water capable of causing the catastrophic flooding that the scientists proposed for the canyons at Chryse.[3] A video animation in the article shows a hypothetical watery Martian landscape drying out into the windy desert we see today, as its atmosphere depletes under a merciless sun.

Wind: Another article on *PhysOrg* discusses the sandblasting effect of constant wind. "**Winds on Mars can be strong and can reach hurricane speed** (more than 120 kilometres per hour or 75 miles per hour)," said Francois Ayoub of Caltech.[4] He added that at the study site (a 15-square mile area at Nil Patera, observed for one Martian year), such winds were a daily occurrence. "**High winds are a near-daily force** on the surface of Mars, **carving out a landscape** of shifting dunes and posing a challenge to exploration," the article begins. This was a surprise:

> But **data about the strength, frequency and origin of winds has been sketchy**, and **many specialists had expected** that gusts strong enough to move sand **would be rare** on a planet with such a thin atmosphere.

"We **observed** that martian **sand dunes are currently migrating** and that their migration speed varies with the season, **which is at odds with the common view of a static martian landscape** and very **rare** sand-moving winds," study co-author Francois Ayoub of the California Institute of Technology's planetary sciences division told AFP.

The study shows that even in today's thin Martian atmosphere (about 1% the density of Earth's), the winds are strong enough to form and move the large sand dunes seen at many locations on Mars. Wouldn't billions of years of wind have eroded every landform, including the canyons and volcanoes, into small particles, long before now?

These questions never seem to faze the astrobiologists. NASA's *Astrobiology Magazine* tried recently to revive interest in possible indications of life in Martian meteorites, just like one dubbed ALH 84001 did when featured at a famous 1996 press conference that gave birth to the new "science" of astrobiology — still looking for pertinent subject matter to scientifically study.[5]

1. Irwin, R.P., S. Tooth, R.A. Craddock, A.D. Howard, A. Baptista de Latour. 2014. Origin and development of theater-headed valleys in the Atacama Desert, northern Chile: Morphological analogs to martian valley networks. *Icarus* 243:296–310.
2. Rodríguez, J.A.P., V.C. Gulick, V.R. Baker, T. Platz, A.G. Fairén, H. Miyamoto, J.S. Kargel, J.W. Rice, and N. Glines. 2014. Evidence for Middle Amazonian catastrophic flooding and glaciation on Mars. *Icarus* 242:202–210.
3. NASA (2014, Sep 24). Coronal mass ejections at Mars. *PhysOrg*. Retrieved November 7, 2014, from http://phys.org/news/2014-09-coronal-mass-ejections-mars.html
4. Nature Communications (2014, Sep 30). Sandblasting winds shift Mars' landscape. *PhysOrg.* Retrieved November 7, 2014, from http://phys.org/news/2014-09-sandblasting-shift-mars-landscape.html
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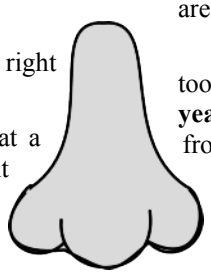
The Cures Are Inside You

Your body has the means to repair itself, if the right cells get into the right places.



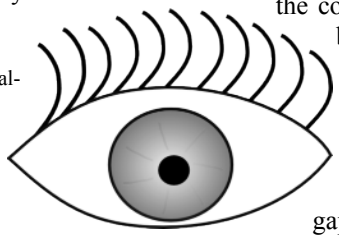
A nose for repair: *Medical Xpress*[1] reported that a man with a severed spinal cord—an injury thought to be irreparable—has recovered partial sensation and movement of his limbs. The secret: transplanted cells from his nose! This is astonishing; it offers hope for quadriplegics some day.

> Treating patients with a complete spinal cord injury (SCI), the condition in which no motor or sensory function is preserved in the spinal segments below the level of the injury, has **generally been unsuccessful.** This is because **no treatment methods have been able to regenerate the severed spinal nerves across the injured area.** Now, doctors in Poland and scientists from England **may have restored some function and sensory sensation** to a 38 year-old man who had sustained a traumatic transection (severing) of the spinal cord in the upper vertabral level Th9. **By removing one of his olfactory bulbs, where the sense of smell resides, and transplanting his own olfactory ensheathing cells (OECs) and olfactory nerve fibroblasts (ONFs) into the damaged area** along with a nerve "bridge" constructed between the two stumps of the damaged spinal column, they have **seen some voluntary limb function and sensation recovery** over a 19 month follow-up.

An update posted several days later on *Medical Xpress*[2] says the patient is not only walking, but can dress and undress himself and get into bed without help. Darek, age 40, described his progress with tears in his eyes. The doctors are now seeking new patients for the life-changing treatment.

Diabetes cure? A new stem cell recipe offers hope for diabetics, *Science Magazine*[3] reported. It appears that the stem cells could be embryonic or induced pluripotent stem cells; either way, the stem cells appear able to create the pancreatic beta cells necessary to produce insulin. Tests with mice have cured them of diabetes. "**The diabetes research community has been waiting for ages for this type of breakthrough**," one researcher said. Human treatments are probably years away, though.

The all-healing eye: Could the cure for blindness be right in front of your eyeballs? *Medical Xpress*[4] says that stem cells found in the cornea show hope for restoring sight to the blind. "Scientists at the University of Southampton have discovered that **a region on the front surface of the eye harbours special stem cells** that **could treat blinding eye conditions**," the article begins; these cells are found "in a narrow gap lying between the transparent cornea and white sclera." Macular degeneration is one of the diseases that may be treatable with these stem cells.



Professor Andrew Lotery, of the University of Southampton and a Consultant Ophthalmologist at Southampton General Hospital led the study. He comments: "**These cells are readily accessible, and they have surprising plasticity**, which makes them an attractive cell resource for future therapies. This would help **avoid complications with rejection** or contamination because the **cells taken from the eye would be returned to the same patient**. More research is now needed to develop this approach before these cells are used in patients."

Another good thing: these cells are found in old people's eyes, too, "and **can be cultured even from the corneal limbus of 97 year olds.**" This offers hope of treatment for both old and young from their own eyeballs.

Wait—there's more: These are just a few examples of a burgeoning movement to find healing cells within the body. Stem cells have been found in the esophagus (*ScienceDaily*[5]), possibly available to treat throat conditions and cancer. Stem cells in the brain (*ScienceDaily*[6]) appear to have an "unexpected role" in regenerating lost neurons, a repair long thought impossible. And stem cells in placentas (*ScienceDaily*[7]) might one day treat multiple sclerosis. Clinical trials so far show this is safe. Another story on *Medical Xpress*[8] says that researchers at Washington University in St. Louis have reprogrammed mouse skin cells directly into brain cells, without having to go through the stem cell stage. This could herald future treatments for Huntington's Disease and other brain disorders.

1. Pheby, J. (2014, Oct 20). Paralysed man walks again after breakthrough treatment (Update). *Medical Xpress*. Retrieved November 14, 2014, from http://medicalxpress.com/news/2014-10-paralyzed-recovers-function-transplantation-oecs.html
2. Waszak, S. (2014, Oct 22). Doctors who helped paralysed man walk seek new

... continued on p. 5

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All by Design

by Jonathan C. O'Quinn, D.P.M., M.S.

Eyes of a Different Color

Evolution teaches that over immense periods of time, certain very specific traits improving the odds of survival developed in living things by chance. Let us please call nonsense by its name!

Arctic reindeer are subjected to extremes of light in their habitat, from continuous daylight in summer to nearly continuous darkness in winter. For the sake of enhanced detection of both food and predators, Arctic reindeer cope with these changing light levels by changing the color of their eyes.

Specifically, there is a layer of specialized cells just behind the retina in these animals called the tapetum lucidum (TL). During summer, the TL is a golden color, which reflects more light out of the eyes, avoiding over-stimulation of the retina. With winter darkness, the pupils dilate, intraocular (within the eyes) pressure increases, and the TL is compressed. Consequently, the space between collagen fibers in this elastic tissue is reduced, reflecting the blue wavelengths of light more common in Arctic winters.

Strolling reindeer (*Rangifer tarandus*) in the Kebnekaise valley, Lappland, Sweden.

This blue coloration of the TL during winter reflects less light out of the eye and thus scatters more light through the retina's photoreceptors, enhancing the reindeer's vision in low-light conditions. Also, the blue color of the TL in winter allows the reindeer to see ultraviolet light, further enhancing their winter vision. All of this happens automatically each year — the reindeer do not have to think about it at all.

Logically, how could such a physiologic change have ever been developed by mere random chance? Is it not more reasonable to acknowledge the handiwork of an intelligent Designer when it is so apparent?

Reference

Anonymous (2013, Oct 29). Bright eyes: Study finds reindeers' eyes change colour with Arctic seasons. *PhysOrg*. Retrieved Oct 27, 2014, from http://phys.org/news/2013-10-bright-eyes-reindeers-colour-arctic.html#nRlv