REASON & REVELATION
A MONTHLY JOURNAL OF CHRISTIAN EVIDENCES
FEBRUARY 2006

THE BREATH OF LIFE—NOT A PRODUCT OF EVOLUTION

Brad Harrub, Ph.D.

Most people have heard the expression "like a fish out of water" at some time or another. This familiar idiom reflects the certainty that most fish cannot breathe or travel about on land. Nevertheless, those who espouse Darwin's beliefs attest that all land-dwelling creatures owe their heritage to some water-dwelling, common ancestor. The respiratory system humans use to obtain oxygen is purportedly just an evolutionary by-product that was "tweaked" by natural selection over millions of years—after all, "necessity is the mother of invention." General biology textbooks record the evolution of the respiratory system as though it were a process as simple as walking up a flight of stairs. Initially, single-celled organisms used diffusion to obtain oxygen. When multicellular organisms came onto the scene they needed a more efficient means to meet the increased oxygen demand, so a respiratory system resulted. Individuals who subscribe to the evolutionary theory maintain that gills represent an ancient respiratory system. From gills fish developed swim bladders, which then gave rise to lungs, allowing creatures to walk onto the land. Millions of years later, man has a complete respiratory system that is nothing more than an advanced swim bladder that has been optimized through natural selection and genetic mutations. Or so the story goes.

One example of this "just-so" storytelling can be found in Starr and Taggart's *Biology* textbook. They noted:

> Toward the end of the Devonian [allegedly more than 250 million years ago—BH] one of the lineages of lobe-finned fishes succeeded in moving onto land. The fins of these animals, already thick and muscular, were perhaps adapted for moving slowly through shallow water and thick aquatic vegetation; their ancestors had long ago begun to rely on air-breathing, as do many fishes living in stagnant waters today.... Forty million years after the pioneering forays of plants, the vertebrate invasion of land was under way (1987, p. 559).

Biology textbooks are replete with chapters on the origin of life. While the pictures, charts, graphs, evolutionary trees, and specific sentences may vary, a common theme can be found throughout each one—the premise that life evolved out of the water and onto the land. This process would require a massive change in the breathing mechanics of organisms, but most textbooks treat it as a simple conversion that would be easily accomplished with colossal amounts of time. (Imagine for a moment evolving a boat into an automobile that can drive on the interstate. While this analogy is far removed from the respiratory system, it does help point out the magnitude of changes that would be necessary for converting from water-breathing to air-breathing.) The human body is too large to obtain oxygen by means of diffusion through the skin—thus, an elaborate respiratory system is required. Can evolution adequately explain the breath of life?

THE CRUX OF CELLULAR RESPIRATION

Most individuals would be surprised to learn that the primary definition of respiration is not "breathing," but rather, using oxygen to release energy that is stored in food molecules. Simply put, it is a means of acquiring cellular energy. *Stedman's Medical Dictionary* defines respiration as "a fundamental process of life in which oxygen is used to oxidize organic fuel molecules, providing a source of energy as well as carbon dioxide and water" (McDonough, 1994, p. 880). There are actually two types of respiration that are intimately linked: organismic and cellular. Organismic respiration is the physical process of getting oxygen into the body, while

CONTENTS

cellular respiration involves a complex series of reactions using that oxygen to provide energy to the body. All cells carry out some form of respiration. This process allows a cell to transfer chemical energy stored in carbohydrates, lipids, and some proteins into carrier molecules such as adenosine triphosphate (ATP). Cells then use stored ATP as necessary in various reactions within the cell—especially in the production of cellular proteins. As the food molecules are broken down, energy is released that can be used to maintain the cell. This process is dependent, however, on oxygen. [NOTE: Anaerobic respiration or fermentation can occur in the absence of oxygen, but do not play a vital role in the human respiration system].

The critical role oxygen plays in providing cellular energy can be seen in the following equation. If one were to add oxygen to a glucose molecule (a simple sugar), the result would be carbon dioxide and water—with an overall yield of 36 adenosine triphosphate (ATP) molecules! Cells utilize ATP as the energy currency for most reactions in the cell that require energy.

$C_6H_{12}O_6 + 6O2 + 6CO_2 + 6H_20$
(with a typical energy yield of 36 ATP)

This cellular process is known as glycolysis. Most evolutionists believe this process started by fermentation. From this, allegedly more complex forms of respiration evolved that require catalyzation by a large number of complex enzymes. But that is where a major problem arises. In order to break down the six-carbon sugar of glucose **enzymes are required**. Each step within the chemical reaction of glycolysis is further catalyzed by specific enzymes, whose origin is still unexplainable by evolutionary assumptions. Enzymes are proteins that are made within the cell—**but their production requires energy**. Thus, cells require ATP to manufacture enzymes before glycolysis can even occur. (The old adage of "it takes money to make money" is applicable here—it takes energy to produce energy!) **As such, evolutionists have an enormous chicken-egg problem.** Which came first, glycolysis to make energy or energy from glycolysis needed to make enzymes? Without the enzymes, glycolysis could not occur to produce ATP. But without the ATP those enzymes could not be manufactured. This is strong evidence that the process of cellular respiration is not the product of evolution. As John Maina and John West observed: "Molecular oxygen is vital for generation of energy that in turn is fundamental to life" (2005, 85:838).

The other point that should not be missed is that glucose and other sugars are only present within living things in nature. This would require plant material or other life forms in existence as a food source. So how does this requirement affect the evolutionary timeline? Why would organisms evolve cellular respiration if glucose or other sugars were not available? This necessity puts restrictions on evolution and the alleged evolutionary appearance of plants.

Finally, we must ask the question of how the first living cells survived if they were still evolving a mechanism to produce and store energy in the form of ATP? If a cell is unable to make proteins, get rid of waste, or successfully divide, then how long would it survive? The obvious answer is that cells have always possessed the ability to manufacture and store energy. Our bodies were **designed** in such a way that complex cascades of chemical reactions occur continuously in cells throughout the body without any conscious effort on our part. We know today that the absence of one of the steps involved in these complex cascades can have dire effects on cellular growth. The only logical explanation is that a Master Architect laid out these complex steps, and we are slowly uncovering the handiwork of that Designer.

THE DEMANDS OF ORGANISMIC RESPIRATION

If neo-Darwinians believe the story gets easier outside the cell, they have deluded themselves. Evolving from gills to lungs is only easy in the pages of biology textbooks. For instance, air-breathing would require fish to be closer to the surface of the water, making them a great deal more vulnerable for predation. It has been documented that deep water species have fewer injuries and lower rates of disappearance than fish in shallow water (Chapman, 1995, 4:113). So would adapting to air-breathing be considered "survival of the fittest"? Additionally, **it has not been documented that fish can evolve a new means of respiration if placed into an environment that has too little oxygen**—for instance, a stagnant pond or drying lake. Consider the critical necessity of a fish in that situation. It would be required not only to evolve the new respiratory structure within its lifetime, but it must also be able to pass this new structure on to its offspring before dying of asphyxia. If true, this evolutionary survival tactic should be easily documented in a laboratory setting, where oxygen levels in the water can be manipulated at will. And yet, decades have passed without even a hint of evidence to support this theory.

Consider just a few of the changes that would be required if evolution truly were the mechanism that produced the human respiratory system. [NOTE: Space limitations prevent an exhaustive review of every necessary physiological component.]

- Respiration would have to change the chemical reactions necessary to go from anaerobic life to aerobic life.
- As life progressed from single-celled organisms into multi-cellular organisms, a circulatory system would be required to deliver oxygen to internal cells that were too far removed for diffusion.

Reason & Revelation is published monthly by Apologetics Press, Inc., a non-profit, tax-exempt work dedicated to the defense of New Testament Christianity. Copyright © 2006. All rights reserved.

Editors:

Brad Harrub, Ph.D.*
(*Neurobiology, University of Tennessee)

Dave Miller, Ph.D.*
(*Communication, Southern Illinois University)

ISSN:

1542-0922

Annual Subscription Rates:

$10.00 Domestic
$ 8.00 Domestic Bulk (5+ to same address)
$16.00 Canada & Overseas Airmail

Mailing Address:

Apologetics Press, Inc.
230 Landmark Drive
Montgomery, AL 36117-2752
U.S.A.

General inquiries, changes of address, or international callers:

Phone: (334) 272-8558
Fax: (334) 270-2002

Orders:

Phone: (800) 234-8558
Fax: (800) 234-2882

On-line Web store/catalog, subscription order/renewal form, current issues, archives, and other information (all orders processed on a secure server):

URL: www.ApologeticsPress.org
E-mail: mail@ApologeticsPress.org

Discovery—Scripture & Science for Kids is a sister publication for children. For more information, please contact our offices or visit the *Discovery* Web site at:

URL: www.DiscoveryMagazine.com

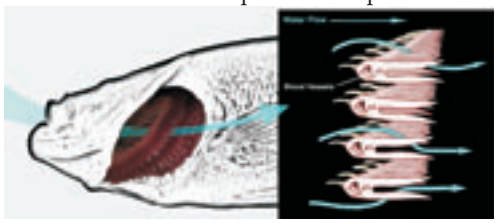
- A metal-based molecular carrier (hemoglobin) would be required to transport the oxygen throughout the circulatory system.
- Organs would be required to bring the oxygen into contact with the blood system (i.e., gills or lungs).
- Then a complete dependence on lungs would be required once animals had translocated onto land.
- However, the body would then be forced to convert to a dry environment. For instance, the "evolution" of tear ducts would be immediately required in order to keep the eyes from drying out.
- An advanced mucosal lining and nasal hairs would be required to protect the lungs from pollutants in the air.
- The evolution of a four-chambered heart and a double-circulatory system would necessitate pulmonary vessels and additional nerves.
- The alleged evolution of warm-blooded (endothermic) animals from cold-blooded (ectothermic) would require a higher metabolic state—bringing on a host of demands on the evolving respiratory system.
- A shift from mouth (or buccal-force pump) breathing to thoracic suction (aspiration pump) breathing would demand coordinated use of intercostal muscles and the diaphragm. The breathing mechanism for most amphibians is the buccal pump, in which muscles around the mouth and face force air into the lungs. Humans use thoracic muscles in an aspiration pump. In commenting on these two different breathing methods, Brainerd admitted: "**No extant animals possess an intermediate mechanism**..." (1999, p. 13).

Keep in mind that some type of functional respiratory system would be required throughout all of these steps. Knowing that oxygen is **required** by all living things—including plants, insects, birds, fish, and land-dwelling creatures—evolutionists must surely find themselves overwhelmed at the thought of explaining such amazing sophistication and diversity. But not only is oxygen (a gas) required, but, in humans, it must be able to diffuse into a liquid (blood) without contamination from foreign material. Thus, an effective blood/gas exchange must be functional, and yet protective. **Knowing that mutations do not provide new raw material, it should be obvious that the only acceptable scientific explanation for the well-designed respiratory system is an Intelligent Designer.**

EVOLUTIONARY VIEW OF THE ORIGINS OF THE RESPIRATORY SYSTEM

In 1764, Charles Bonnet explicitly launched a great challenge. He posited: "If organized bodies are not 'preformed,' then they must be 'formed' every day, in virtue of the laws of a special mechanics. **Now, I beg you to tell me what mechanics will preside over the formation of a brain, a heart, a lung, and so many other organs?"** (as quoted in Barbieri, 2003, p. 24, emp. added). Precisely how does one form a lung, heart, or brain by evolutionary processes?

In fish, oxygen is primarily obtained by drinking. Water is forced over gill chambers found on each side of the head. Gills are located in gill clefts within the gill chambers, and they consist of fleshy, sheet-like filaments transected by extensions called lamellae. The basic functional unit of the gill is the filament, which supports rows of these lamellae. The lamellae are designed for gas exchange with a large surface area and a thin epithelium surrounding a well-vascularized core of pillar cell capillaries.



Commenting on the complex vascular system of fish, physiology professor Kenneth Olson admitted: "The fish gill is the most physiologically diversified vertebrate organ, and its vasculature the most intricate" (2002, 293:214). He continued describing this multifarious network stating:

> Three vascular networks can be identified within the gill filament. The arterioarterial (respiratory) pathway consists of the lamellae and afferent and efferent segments of the branchial and filamental arteries and lamellar arterioles.... The interlamellar system is an extensive ladder-like network of thin-walled, highly distensible vessels that traverses the filament between, and parallel to, the lamellae and continues around the afferent and efferent borders of the filament.... In the filament body, nutrient capillaries and interlamellar vessels are often closely associated, and the former may ultimately drain into the latter (293:214).

While amazing, this complicated and multifaceted organ provides no clues as to the origin of human lungs, as the two are functionally and anatomically different.

In his book *Origin of Species,* Charles Darwin titled a chapter "Difficulties on Theory." It was within this chapter that he dealt with this conundrum. Darwin noted: "We should be extremely cautious in concluding that an organ could not have been formed by transitional gradations of some kind.... Two distinct organs sometimes perform simultaneously the same function in the same individual; to give one instance, there are fish with gills or branchiae that breathe the air dissolved in the water, at the same time that they breath free air in their swimbladders" (1985, p. 220). He went on to note:

> All physiologists admit that the swimbladder is homologous, or "ideally similar," in position and structure with the lungs of higher vertebrate animals: hence there seems to me to be no great difficultly in believing that natural selection has actually converted a swimbladder into a lung, or organ used exclusively for respiration (p. 221).

A cursory glance at this situation would appear ironic—fish suffocating if they are exposed to air for extended periods. The concentration of dissolved oxygen in water is about one-thirtieth that of air (Maina, 2002, 201:284). But even with this increase in oxygen, a fish will quickly succumb to asphyxia if it is taken out of water, in spite of being in an environment with increased oxygen. Gills are inoperable in dry environments and liquids physically destroy alveoli in the lungs (see Maina, 2002, 201:284).

Consequently, Darwin and his followers argue that the air bladder is the transitional missing link. In his concluding remarks, Darwin proclaimed: "For instance, a swim-bladder has apparently been converted into an air breathing lung. The same organ having performed simultaneously very different functions, and then having specialised for one function" (1985, p. 232). This generalized concept won the approval of many in the scientific community and was heralded as a reasonable response to inquiries on the origin of the respiratory system. One hundred years after Darwin aired his speculations, famed evolutionary taxonomist Ernst Mayr tried to fill in some of the gaps of Darwin's broad speculation:

> As the outer skin became increasingly unsuitable for gas exchange (partly owing to the development of dermal armor) and, even more importantly, as the gills became temporarily rather useless in oxygen-poor stagnant swamps during Devonian drought periods, active air uptake by "air-swallowing" became at times the most important source of oxygen. At this stage, any enlargement of the surface of the inner throat or esophagus, any formation of diverticles, etc., was favored by natural selection (1960, p. 366).

Thirty-six years later, H. Allen Orr found himself discussing this very topic as he tried to defend Darwinism. Orr maintained:

> The transformation of air bladders into lungs that allowed animals to breathe atmospheric oxygen was initially just advantageous: such beasts

> could explore open niches—like dry land—that were unavailable to their lung-less peers. But as evolution built on this adaptation (modifying limbs for walking, for instance), we grew thoroughly terrestrial and lungs, consequently, are no longer luxuries—they are essential. The punch-line is, I think, obvious: although this process is thoroughly Darwinian, we are often left with a system that is irreducibly complex (1996, p. 29).

Complex? Yes! As C.J. Brauner and his colleagues noted: "The transition from aquatic to aerial respiration is associated with **dramatic physiological changes** in relation to gas exchange, ion regulation, acid-base balance and nitrogenous waste excretion" (Brauner, et al., 2004, 207:1433, emp. added). But a Darwinian process? Hardly! Do some fish, such as the lungfish, survive in drought conditions with a specialized respiratory system? Yes. But does the swim bladder or lungfish provide evolutionists with answers for the presence of the human respiratory system? No.

In actuality, the presence of an air-bladder actually poses an even bigger dilemma for evolutionists. Darwin was not aware of the fact that oxygen entered the swim bladder of fish by the blood rather than a trachea! **Thus, oxygen is actually removed from the blood stream to inflate the swim bladder.** Jonathan Wittenberg observed: "Gases are brought into the swim-bladder of fishes through the combined action of a glandular epithelium, the gas gland, and a vascular structure, the rete mirabile, supplying blood to the gland" (1961, 44:521). He went on to conclude that "the active transport of oxygen into the swim-bladder by the gas gland is a transport of molecular oxygen" (44:521).

Swim bladders are used primarily by fish to achieve neutral buoyancy (see Berenbrink, et al., 2005, 307:1752). But if researchers are correct, swim bladders pushed fish further away from air-breathing and "lungs." As Berenbrink, et al. observed: "The subsequent evolution of an O_2 secretion mechanism to inflate the swimbladder **removed the need to take in air through the esophagus at the surface**, allowing colonization of new habitats such as the deep sea" (307: 1752, emp. added). Why would a creature purposefully remove oxygen from the blood stream if it were "evolving" a lung-type structure for respiration? It would not, even if such were possible.

Additionally, Marsh Tenney admitted: "Besides the paleontological argument separating the branch with swim bladder from the branch with lungs there are anatomical differences in blood supply. **The placement of the swim bladder dorsally is necessary for its effective buoyancy function, while the lung develops ventrally"** (1979, p. 64, emp. added). Tenney further observed: "Although the mouth, gills, and air bladder can all serve more or less effectively to perform the function of gas exchange, the troublesome question of the origin of the tetrapod lung is not greatly aided by these observations. Although there is a large literature which seeks to identify a homologous relationship between the air bladder and the lung, such is probably not the case" (p. 64).

The conclusion is apparent: Darwin was wrong. The lung did not evolve from the swim bladder. We have observed that organic evolution falls short in explaining cellular respiration, and swim bladders produce more questions than answers. Now it is time to turn our focus to the intricacy and complexity of the human respiratory system as additional evidence against the evolutionary theory.

ANATOMY OF THE HUMAN RESPIRATORY SYSTEM

The primary task of the respiratory system is gas exchange. However, it is also involved in a host of other activities including ventilation (breathing), oxygen utilization, and the removal of carbon dioxide from the body. The principle structures involved in this process are the nasal cavity, pharynx, larynx, trachea, the bronchi, bronchioles, and alveoli of the lungs (see Netter, 1994; Agur, 1991). The respiratory system naturally divides into the conducting division and the respiratory division. The conducting division is comprised of all of the tubes and structures that transport gases to the respiratory division. Gas exchange occurs in the respiratory division which includes the bronchioles and alveoli.

The Conducting System

Most individuals are familiar with the shock and pain that is experienced when humans leave a heated environment and walk out into frigid, sub-zero weather. The lungs oftentimes will feel like they are burning, and it occasionally becomes more difficult to breath. The problem is not the cold air—but rather, the **sudden change** in the temperature and humidity of the air. While the body will eventually acclimate itself, the body did not have sufficient time to condition the air entering the respiratory system. Part of the job of the conducting system is to warm and humidify the air before it reaches the lungs. In addition, it serves as a filter to cleanse the air before gas exchange occurs. Consider what the result would be if the air was not warmed, humidified, and cleansed.

The two openings for air to enter the body are the mouth and nose. As air enters the nasal cavity it is warmed by the extensive network of blood vessels that cover the nasal cavity. Blood, which is maintained at normal body temperature, passes this heat on to cool air as it enters the body. (This extensive vascularization also explains why humans occasionally experience nosebleeds, especially when the tissue within the nose dries out). No one would deny that radiators on automobiles are the product of design, yet the human nose possesses a vascular radiation system that makes car radiators appear primeval. From where did the nose originate and how did it become so vascularized? The nares (paired nostrils) of a fish were not designed to inhale and exhale air constantly as is found in humans. Are we to believe that this dense vascularization is the product of chance?

The nasal cavity is also covered in hairs called "vibrissae, which often extend from the nostrils and filter macroparticles that might otherwise be inhaled. Fine particles such as dust, pollen, or smoke are trapped along the moist mucous membrane lining the nasal cavity" (Van de Graaff and Fox, 1989, p. 751). Again, if this system is a product of gill-to-lung evolution, whence did these vibrissae originate? Fish certainly do not have a need for them, as they obtain oxygen through the water and thus do not need to filter air. Air leaving the mouth or nasal cavity is directed into a funnel-shaped passageway known as the pharynx. It is here that the hand of a Designer can clearly be seen.

Cilia and the Deafening Silence of Professional Literature

The pharynx is lined with a mucus membrane covered with mucus-secreting goblet cells. The mucus helps trap dust, pollen, and other foreign debris. Without this special coating, these harmful particles would be transported to the area where gas exchange occurs, halting normal physiologic processes. But mucus in-and-of-itself is not a cure all. If left exposed on the walls of the pharynx, mucus would eventually dry up and provide no protection. Thus, the body must be able constantly to eliminate the old and apply a coat of new mucus. Enter a special group of finger-like projections known as cilia. These special projections beat in a uniform manner, sweeping away the old mucus and applying a "fresh" coat, allowing the proper pharyngeal conditions to be maintained. As Alberts and his colleagues described:

Bee Flight Physics and the Creator

Dave Miller, Ph.D.

In 1934, using mathematical calculations, French entomologist August Magnan concluded that bee flight was aerodynamically impossible. The haphazard flapping of their wings simply should not enable bees to fly. The mystery that has perplexed scientists ever since (due to inadequate understanding of aerodynamic theory) is now believed to have been clarified. Using high-speed digital cameras and a giant robotic model of a bee wing, bioengineers at the California Institute of Technology and the University of Nevada at Las Vegas have been studying honeybee flight in an effort to determine how bees fly (Altshuler, et al., 2005). They discovered that bees operate with the same basic aerodynamic principles that facilitate flight capability in other flying creatures, including velocity, wing stroke amplitude, stroke reversals, wingbeat frequency, and wing length. They simply utilize these principles in different proportions and combinations.

Why? Why would bees operate on altered aerodynamic principles? The scientists do not know. They speculate that since bees consume floral nectar, they possess "excess power available for ecologically useful but aerodynamically expensive behaviors" (102[50]:18218). Observe that "ecologically useful" implies that bee flight is specifically suited to bee activity—which is another way to say that a bee is strategically and deliberately **designed** to fulfill its function efficiently. The scientists compare honeybees to hummingbirds "that are able to forage for high-energy nectar rewards by using **more energetically demanding flight**" (102[50]:18218, emp. added). In other words, the use of adjusted aerodynamic principles is not due to alleged inherited evolutionary inefficiency; rather, it is the result of deliberate design calculated to achieve different objectives and accommodate different purposes. Hummingbirds do not fly like sparrows—because they are not sparrows! And bees do not fly like mosquitoes—because they are not mosquitoes! Each flying creature's flight capabilities are specifically suited to accommodate its created purpose and function.

Do bees have any specific needs in order to accomplish their peculiar functions? Yes, and the scientists, themselves, offer the following: "Honeybees and other hymenopterans [the order of insects that includes bees, wasps, and ants—DM] need to carry much heavier loads that may actually exceed body mass in numerous contexts, including undertaking, prey transport, and foraging for nectar or pollen" (102[50]:18218). Again, in other words, bee flight is **specifically designed** to accommodate the tasks that bees perform. But design demands a designer! Design requires an intelligence that exceeds the blind, mechanistic forces of nature.

Here is the conclusion set forth by the researchers:

> In conclusion, our analysis of honeybee aerodynamics reveals how the rapid low-amplitude wing motion of bees is sufficient to maintain the weight of the animal. [We knew that—DM.] Furthermore, honeybees exhibit considerable ability to generate **excess aerodynamic power**, which they accomplish by raising stroke amplitude while maintaining constant frequency. This ability may be related to **requirements of social insects** to carry loads related to foraging, undertaking, and brood transport (102[50]:18218, emp. added).

Notice: the bee deliberately generates extra aerodynamic power. Why? The scientists speculate that it is due to the bee's need to carry out its social duties—the requirements it possesses due to its place in the insect social order. My friend, such a circumstance has intelligent design written all over it. Such complexity, such design, such planning, and such purpose could not have happened without a Mind. That Mind is none other than the God of the Bible:

> Lift up your eyes on high, and see who has created these things, Who brings out their host by number; He calls them all by name, by the greatness of His might and the strength of His power.... For thus says the Lord, Who created the heavens, Who is God, Who formed the earth and made it, Who has established it, Who did not create it in vain, Who formed it to be inhabited: "I am the Lord, and there is no other" (Isaiah 40:26; 45:18).
>
> You are worthy, O Lord, to receive glory and honor and power; for You created all things, and by Your will they exist and were created (Revelation 4:11).

REFERENCE

Altshuler, Douglas L., William B. Dickson, Jason T. Vance, Stephen P. Roberts, and Michael H. Dickinson (2005), "Short-Amplitude High-Frequency Wing Strokes Determine the Aerodynamics of Honeybee Flight," *Proceedings of the National Academy of Sciences*, 102[50]:18213-18218, December 13.

R&R RESOURCES

QUESTION & ANSWER

Q Did Methuselah die during the global Flood?

A In Genesis chapter 5, Moses recorded the genealogy of Adam. The name that commonly stands out in that list is Methuselah. Methuselah is the oldest person recorded in Scripture, and his name is often used today when referring to something or someone very old. In verse 21 of that chapter, we learn that Methuselah was the son of Enoch. We are then informed:

> Methuselah lived one hundred and eighty-seven years, and begot Lamech. After he begot Lamech, Methuselah lived seven hundred and eighty-two years, and had sons and daughters. So all the days of Methuselah were nine hundred and sixty-nine years; and he died. Lamech lived one hundred and eighty-two years and had a son (vss. 25-28).

Lamech's son was Noah. The Bible records in Genesis 7:6 that Noah was 600 years old when the floodwaters were on the Earth. In light of this information, we can take the age of Methuselah when Lamech was born (187), add to that Lamech's age when he begot Noah (182) and the age of Noah when the floodwaters came (600), and determine that Methuselah was 969 years old the year the Flood occurred [187+182+600=969]. Since Genesis 5:27 indicates this was the age at which Methuselah died, it is logical to conclude that he died the year of the Flood. However, the Bible does not indicate that he died as a **result** of the Flood. [Remember, his father was Enoch, one of a select few who walked with God and was taken directly by God, not experiencing death. Thus, Methuselah's father was a very righteous man, who undoubtedly set a proper example for his son.] While the exact meaning of Methuselah's name is unknown, many scholars have suggested that it means: "When he dies, it shall be sent," implying that the Flood would result when Methuselah died (Morris, 1976, p. 160). But, here again, we cannot be certain and should not be dogmatic.

Brad Harrub

REFERENCE

Morris, Henry (1976), *The Genesis Record* (Grand Rapids, MI: Baker).

IN THE NEWS

As the creation-evolution debate rages in courtrooms throughout America, and while lawsuits are being filed continually in objection to various visible vestiges of America's Christian heritage, one court case in Viterbo, Italy is drawing worldwide attention. Atheist Luigi Cascioli is suing Catholic priest Enrico Righi for teaching that Jesus lived on Earth 2,000 years ago. Cascioli contends that Righi and the Catholic church have deceived many people by teaching that Jesus was a real historical person who actually lived in Palestine during the first century. After Judge Mautone initially refused to hear the case, his decision was overruled in December 2005 by the Court of Appeal, "which agreed that Signor Cascioli had a reasonable case for his accusation that Father Righi was 'abusing popular credulity' " by teaching the historicity of Jesus (Owen, 2006). Righi has now been ordered to appear in court "to prove that Jesus Christ existed" (Owen).

A mountain of evidence exists for the reality of Christ (none more important than the historical, inspired New Testament documents), and yet skeptics continue to allege that he is merely a figment of our imagination, and/or has been confused with one of several "known" historical persons from the first century. If skeptics and atheists are now going to take "Jesus" to court (which should not concern Christians in view of the evidence supporting His historicity), perhaps those same individuals will be consistent and put their beloved theory of evolution on trial. After all, evolutionary science professors worldwide teach students the "fact" that the Universe is the product of a Big Bang, yet no one has ever proven such to be the case. (In reality, a growing number of scientists are beginning to reject this explanation for the origin of the Universe—see Harrub, 2005). What's more, students are repeatedly taught that life came from non-living chemicals billions of years ago, even though no one has ever witnessed spontaneous generation take place, and the law of biogenesis flatly contradicts this theory.

The fact that Cascioli's case has reached this far is a sad commentary on today's society. The fact that the unproven theory of evolution continues to get a free pass among "enlightened" skeptics who (allegedly) want only "the facts," is also telling.

Eric Lyons

REFERENCES

Harrub, Brad (2005), "Big Bang Breakdown," [Online], URL: http://www.apologeticspress.org/articles/309.

Owen, Richard (2006), "Prove Christ Exists, Judge Orders Priest," *The Times Online*, January 3, [Online], URL: http://www.timesonline.co.uk/article/0,,13509-1967413,00.html.

> Ciliary beating is an extensively studied form of cellular movement. Cilia are tiny hairlike appendages about 0.25μm in diameter with a bundle of microtubules at their core.... The primary function of cilia is to move fluid over the surface of the cell or to propel single cells through a fluid.... On the epithelial cells lining the human respiratory tract, huge numbers of cilia (10^9/cm^2 or more) sweep layers of mucus, together with trapped particles of dust and dead cells, up toward the mouth, where they are swallowed and eliminated (Alberts, et al., 1994, p. 815).

They continued:

> Fields of **cilia bend in coordinated unidirectional waves**. Each cilium moves with a whiplike motion: a forward active stroke, in which the cilium is fully extended and beating against the surrounding liquid, is followed by a recovery phase, in which the cilium returns to its original position with an unrolling movement that minimizes viscous drags (Alberts, et al., p. 816, emp. added).

Coordinated, unidirectional waves? This sounds like **purposeful** movement! The fact that cilia are specifically located in large numbers in the respiratory tract, provide protection from dust and pollen, and act in a coordinated manner does not sound like a chance occurrence. Consider the microtubules and molecular motors that must be present for cilia to function properly. In their classic book *Molecular Biology of the Cell*, Alberts, et al., spend entire chapters discussing the mechanical properties of actin, tubulin, vimentin polymers, microtubules, microtubule-associated proteins, kinesin, and dyenin (pp. 803-820). Each molecular structure plays a specific role in coordinating these waves. For instance, dynein principally drives the movements of the cilia—but many accessory proteins are also needed. Yet, all of these parts must be present (and working) in order for cilia to perform their role in the respiratory system. **Evolution cannot explain this type of irreducible complexity!**

So from exactly where did these cilia originate? Why the need in the first place? After all, if one is to believe that organic evolution is correct, then this theory must hold the answer. We can easily deduce that the aqueous environment of fish would make these unnecessary in the uptake of oxygen as is found in humans. In his famous book, *Darwin's Black Box*, biochemist Michael Behe noted:

> A quick electronic search of the professional literature shows more than a thousand papers in the past several years that have cilia or a similar word in the title. Papers have appeared on related topics in almost all the major biochemistry journals, including *Science, Nature, Proceedings of the National Academy of Sciences, Biochemistry, Journal of Biological Chemistry, Journal of Molecular Biology, Cell*, and numerous others. In the past several decades, probably ten thousand papers have been published concerning cilia.... [O]ne would expect that the evolution of the cilium would be the subject of a significant number of papers in the professional literature. One might also expect that, although perhaps some details would be harder to explain than others, on the whole science should have a good grasp of how the cilium evolved. The intermediate stages it probably went through, the problems that it would encounter at early stages, the possible routes around such problems, the efficiency of a putative incipient cilium as a swimming system—all of these would certainly have been thoroughly worked over. **In the past two decades, however, only two articles even attempted to suggest a model for the evolution of the cilium that takes into account real mechanical considerations. Worse, the two papers disagree with each other** even about the general route such an evolution might take (Behe, 2003, pp. 67-68, emp. added).

Behe concludes:

> The amount of scientific research that has been and is being done on the cilium—and the great increase over the past few decades in our understanding of how the cilium works—lead many people to assume that even if they themselves don't know how the cilium evolved, somebody must know. **But a search of the professional literature proves them wrong. Nobody knows** (p. 69, emp. added).

Some might argue that these tiny projections are not really relevant, and so what does it matter? Exactly how important are these tiny hair-like projections? Ask someone suffering from Immotile Cilia Syndrome, or individuals who produce abnormally thick mucus and suffer from cystic fibrosis—whose respiratory passages fail to be cleared. These cilia were designed for a specific reason to perform a specific function.

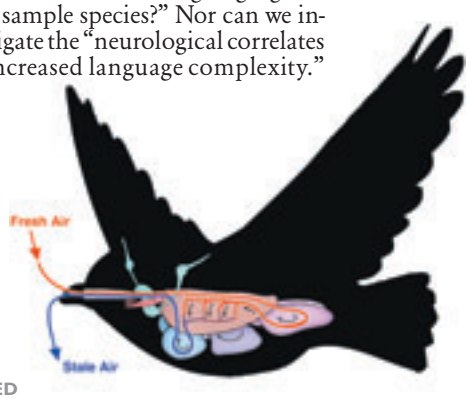
Larynx and Vocal Folds

As air makes its way towards the alveoli of the lungs it passes from the pharynx into the larynx. The larynx is commonly referred to as the voice box, and it is the site of another major hurdle for evolutionists. The very existence of the delicate but intricate framework of muscles and cartilage that composes the voice box cries out "Creator." There are several small but precisely paired constrictor muscles that help change the length, position, and tension of the vocal folds, each one having a specific innervation (see Agur, pp. 597-598). The larynx has two functions: (1) to prevent food and fluids from entering the trachea; and (2) to produce sounds. **The mechanics involved in oral communication have anatomical requirements that are found only in humans**. We know of no living animal, nor one that has been observed in the fossil record, that possesses anything close to the larynx ("voice box") present in humans. While birds can make sounds, they do not use a larynx to communicate language. Werner Gitt admitted as much in his book, *The Wonder of Man*:

> Only man has the gift of speech, a characteristic otherwise only possessed by God. This separates us clearly from the animal kingdom.... In addition to the necessary "software" for speech, we have also been provided with the required "hardware" (1999, p. 101).

Additionally, the lack of any "transitional" animal form (with the requisite speech hardware) in the fossil record poses a significant continuity problem for evolutionists. As Terrance Deacon remarked:

> This lack of precedent makes language a problem for biologists. Evolutionary explanations are about biological continuity, so a lack of continuity limits the use of the comparative method in several important ways. We can't ask, "What ecological variable correlates with increasing language use in a sample species?" Nor can we investigate the "neurological correlates of increased language complexity."



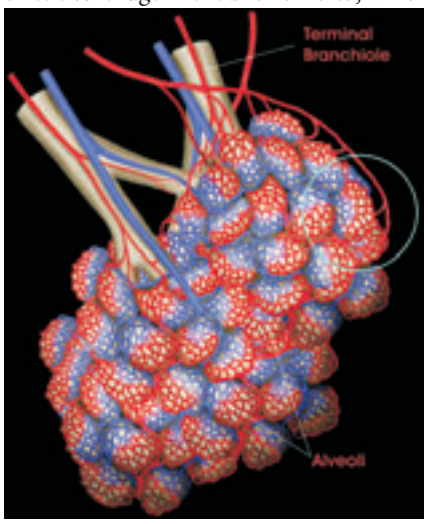
There is no range of species to include in our analysis (1997, p. 34).

The lungs produce the initial air pressure that is essential for the speech signal. The pharyngeal cavity, oral cavity, and nasal cavity shape the final output sound that is perceived as speech. Can evolution explain the existence of the larynx and why other animals have not evolved the ability to speak? It cannot.

The Perfectly Designed Trachea and Bronchi

Air leaving the larynx flows directly into the trachea or windpipe. The *Oxford Companion to the Human Body* noted: "The airways below the larynx consist of the trachea, a tube that extends almost to the middle of the chest; (ii) the bronchi (bronchial tree), formed by the trachea splitting into two and then each branch dividing again; (iii) the bronchioles—thin and short distensible airways that again divide many times to form (iv) the alveolar ducts from which (v) the alveoli arise" (Blakemore and Jennett, 2001, pp. 437-438). While many might assume the trachea is a simple tube conducting air from the mouth to the lungs, it, too, reveals the handiwork of God. For instance, the cartilage that composes the trachea is positioned in many C-shaped rings stacked one on top of another. The open part of the "C" is positioned next to the esophagus, allowing individuals to continue breathing even when food is being directed toward the stomach (Agur, 1991, pp. 68-69). Additionally, these cartilaginous rings provide a rigid framework that helps keep the lumen open continuously. All along the inside walls of the trachea are more cilia and mucus-secreting goblet cells (see Van de Graaff and Fox, 1989, p. 754). If dust is carried into the trachea, the cilia sweep it up toward the pharynx where it can be removed by the cough reflex and/or by being carried down the esophagus. Is this well-designed, protective mechanism simply an apparent design without a designer? Exactly where did those cartilaginous "C" rings, cilia, and goblet cells originate? The evidence unequivocally points to an Infinite Designer!

The trachea branches into two bronchi and then continues to branch into a bronchial tree. Van de Graaff and Fox describe the process: "The bronchus divides deeper in the lungs to form secondary bronchi and segmental (tertiary) bronchi. The bronchial tree continues to branch into yet smaller tubes called bronchioles. There is little cartilage in the bronchioles, which contain thick smooth muscle that can constrict or dilate these airways" (p. 754). Realize that branching in-and-of-itself is an amazing feat! How does the body know when to stop pulmonary branching? If the bronchioles did not branch enough, then there would not be enough surface area for the alveoli to perform sufficient gas exchange. Too much branching could be equally detrimental if space were not left for alveoli and gas exchange. What is more, this orchestrated branching system has no parallel in the gills of a fish.



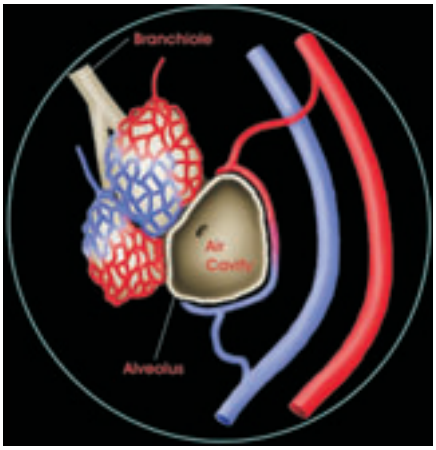
The Respiratory System

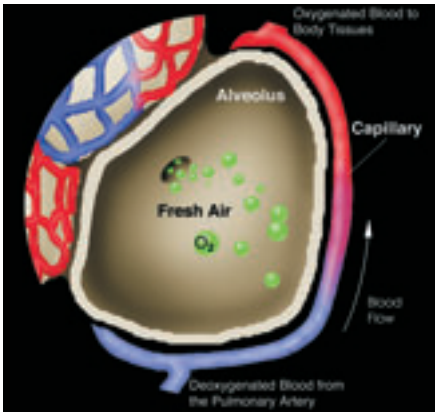
Once the air has been conditioned, it is then ready to be passed on to the division that performs gas exchange which occurs in the lungs. In recounting the feats of the lung, Maina and West remarked:

> Although compared with the closely located, visibly mechanically active heart, the lung may appear relatively inactive, for an organ that throughout life is subjected to changing internal and external pressures both by the pulsating heart and mechanical ventilation by the rhythmic contractions of the respiratory muscles, albeit passively, **the lung is inherently a dynamic organ**. Illustratively: in the human being, as much as 12,000 liters of air and 6,000 liters of blood per day are pumped into and through the lung (2005, 85:812, emp. added).

We know today that at rest an average-sized adult will take in about 250 ml of oxygen each minute, and exhale about 200 ml of carbon dioxide (see Blakemore and Jennett, p. 590).

It is within the alveoli of the lungs that true gas exchange occurs by simple diffusion. Detailing the functional significance of the alveoli, Maina observed: "In the human lung, there are about 300 million alveoli of an average diameter of 250 μm giving an overall alveolar surface area of 143 m^2" (Maina, 2002, 201:288). Since each alveolus is only a single cell-layer thick,

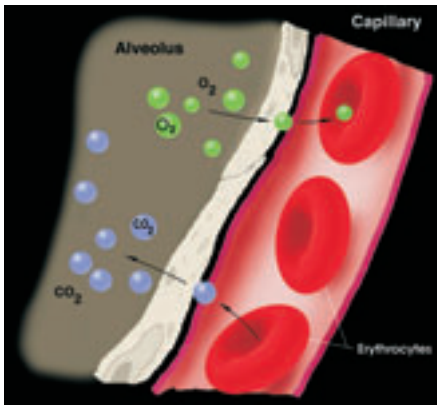




that means the air-blood barrier is normally only two cells thick—one alveolar cell wall and one capillary cell wall. In describing these special functional units, Van de Graaff and Fox commented: "Alveoli are polyhedral in shape and are usually clustered together, like the units of a honeycomb, in groups called alveolar sacs" (p. 759). They continued:

> The enormous surface area of alveoli and the short diffusion distance between alveolar air and the capillary blood quickly bring the blood into gaseous equilibrium with the alveolar air. This function is further aided by the fact that each alveolus is surrounded by so many capillaries that they form an almost continuous sheet of blood around the alveoli (p. 759).

But this complex system is still dependent on hemoglobin to deliver oxygen throughout the body. Without it, oxygen would not be transported to internal organs efficiently. Hemoglobin is a complex protein that has two chains (referred to as alpha and beta)—it gives red blood cells their red color. An evolutionary origin of hemoglobin would require a minimum of 120 mutations to convert an alpha to a beta. At least 34 of those changes require changeovers in 2 or 3 nucleotides. Yet, if a single nucleotide change occurred via mutation, the result would ruin the blood and kill the organism.



The final hurdle that evolutionists have not (and cannot) overcome involves the co-dependence of the respiratory system and the circulatory system. The heart muscle requires oxygenated blood to remain alive. The respiratory system depends on the circulating blood to deliver oxygen and remove carbon dioxide. So which came first, and how was it able to function properly without the other? Yet, another chicken-egg problem for Darwinians! Evolution may continue to be taught as a "fact" in the classroom, but it has yet to answer such basic life-dependent questions as these. Does the human respiratory system owe its origin to some cosmological accident? An honest evaluation would surely indicate that such is not the case.

CONCLUSION

Henry Petroski, a professor of civil engineering and history at Duke University, wrote an article in the *American Scientist* titled "Human Factors" in which he noted: "When something is designed, decisions are necessarily made. **Deliberate progress cannot proceed without choices**—as to whether a part goes to the right or the left of another part, whether a component is larger or smaller" (2000, 88:304, emp. added). He then went on to discuss the "evolutionary design process," but his point is well made. Deliberate progress requires the input of an intelligent being. Decisions were made prior to the formation of the human respiratory system. Those decisions came from the Creator who breathed life into the nostrils of man (Genesis 2:7). As Susan Schiefelbein correctly assessed: "Lungs, heart, trachea, a bronchial tree, and connecting blood vessels all contribute to the **ingenious** breathing system that brings oxygen to the blood and removes carbon dioxide" (1986, p. 132, emp. added). Ingenious indeed!

REFERENCES

Agur, Anne M.R. (1991), *Grant's Atlas of Anatomy* (Baltimore, MD: Williams & Wilkins), ninth edition.

Alberts, Bruce, Dennis Bray, Julian Lewis, Martin Raff, Keith Roberts, and James D. Watson (1994), *Molecular Biology of the Cell* (New York, NY: Garland Publishing), third edition.

Barbieri, Marcello (2003), *The Organic Codes* (London, England: Cambridge University Press).

Behe, Michael J. (2003), *Darwin's Black Box* (New York, NY: The Free Press).

Berenbrink, Michael, Pia Koldkjaer, Oliver Kepp, and Andrew R. Cossins (2005), "Evolution of Oxygen Secretion in Fishes and the Emergence of a Complex Physiological System," *Science*, 307:1752-1757, March 18.

Blakemore, Colin and Shelia Jennett, ed. (2001), *Oxford Companion to the Body* (Oxford, UK: Oxford University Press).

Brainerd, E.L. (1999), "New Perspectives on the Evolution of Lung Ventilation Mechanisms in Vertebrates," *Experimental Biology*, 4:11-28.

Brauner, C.J., V. Matey, J.M. Wilson, N.J. Bernier, and A.L. Val (2004), "Transition in Organ Function During the Evolution of Air-Breathing; Insights From *Arapaima gigas*, an Obligate Air-Breathing Teleost From the Amazon," *The Journal of Experimental Biology*, 207:1433-1438.

Chapman, L.J. (1995), "Seasonal Dynamics of Habitat Use by an Air-Breathing Catfish (*Clarias liocephalus*) in a Papyrus Swamp," *Ecology Freshwater Fish*, 4:113-123.

Darwin, Charles (1985 reprint), *The Origin of Species by Means of Natural Selection or The Preservation of Favoured Races in the Struggle for Life* (London, England: Penguin Books).

Deacon, Terrance (1997), *The Symbolic Species: The Co-Evolution of Language and the Brain* (New York: W.W. Norton).

Gitt, Werner (1999), *The Wonder of Man* (Bielefeld, Germany: Christliche Literatur-Verbreitung E.V.).

Maina, John N. (2002), "Structure, Function and Evolution of the Gas Exchangers: Comparative Perspectives," *Journal of Anatomy*, 201:281-304.

Maina, John N. and Jon B. West (2005), "Thin and Strong! The Bioengineering Dilemma in the Structural and Functional Design of the Blood-Gas Barrier," *Physiological Review*, 85:811-844.

Mayr, Ernst (1960), "The Emergence of Evolutionary Novelties," *Evolution After Darwin, Volume 1: The Evolution of Life: Its Origin, History, and Future*, ed. Sol Tax (Chicago, IL: University of Chicago Press).

McDonough, James T. Jr., ed. (1994), *Stedman's Concise Medical Dictionary* (Philadelphia, PA: Williams & Wilkins), second edition.

Netter, Frank H. (1994), *Atlas of Human Anatomy* (Summit, NJ: Ciba-Geigy).

Olson, Kenneth R. (2002), "Vascular Anatomy of the Fish Gill," *Journal of Experimental Zoology*, 293:214-231, August 1.

Orr, H.A. (1996), "Intelligent Design (Again)," *Boston Review*, 28-31, December/January.

Petroski, Henry (2000), "Human Factors," *American Scientist*, 88:304-308, July/August.

Schiefelbein, Susan (1986), *The Incredible Machine* (Washington, D.C.: National Geographic Society).

Starr, Cecie and Ralph Taggart (1987), *Biology: The Unity and Diversity of Life* (Belmont, CA: Wadsworth Publishing).

Tenney, S. Marsh (1979), "A Synopsis of Breathing Mechanisms," *Evolution of Respiratory Processes*, ed. Stephen Wood and Claude Lenfant (New York, NY: Marcel Dekker).

Van de Graaff, Kent M. and Stuart Ira Fox (1989), *Concepts of Human Anatomy and Physiology* (Dubuque, IA: Wm. C. Brown).

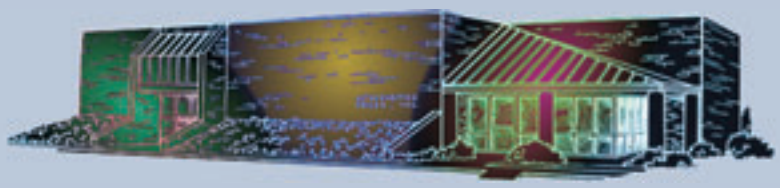
Wittenberg, Jonathan B. (1961), "The Secretion of Oxygen into the Swim-Bladder of Fish," *The Journal of General Physiology*, 44:521-526.

APOLOGETICS PRESS • 230 LANDMARK DRIVE • MONTGOMERY, AL 36117

ADDRESS SERVICE REQUESTED

Nonprofit Organization
U.S. Postage
PAID
Montgomery, Alabama
Permit No. 513

NOTE FROM THE EDITORS



A.P. WEB SITE SETTING RECORDS

In 1868, an article appeared in a New York paper that informed the public:

> A man has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires so that it will be heard by the listener at the other end. He calls the instrument a telephone. Well-informed people know that it is impossible to transmit the human voice over wires (Clemmer, n.d.).

Today this news item is almost comical as metallic telephone "land-lines" have given way to fiber optic cables and cellular towers. Incredible progress has been made in the field of telecommunications—with no signs of slowing down. One aspect of this field has been the tremendous growth of the Internet. Internet usage has increased exponentially in the last decade as more and more people take advantage of this new information medium.

We at A.P. are thankful to have played at least some small role in that growth. Many years ago we would never have dreamed that our Web site would be receiving thousands of hits every day, from countries all across the planet. But it is! **In fact, 2005 was a banner year for "A.P. on the Web," as we exceeded the three million page-hit mark!** That is correct—we surpassed three million page hits last year! The Web site averaged 7,284 hits per day—which translates to five hits every minute! Like the telephone industry itself, we are making some serious progress—and we do not intend to slow our pace. Indeed, our goal is to shatter the 2005 record in 2006 by working even harder to provide the public with cutting edge commentary on the leading cultural, moral, scientific, and religious issues of our day.

If you are not familiar with our Web site, we update our site every Monday morning, with several new faith-building articles. In addition, we archive all past articles, including past issues of *Reason & Revelation*. The Web site features several stimulating categories: Alleged Bible Discrepancies, Article Reprints, Bible Bullets, Decisive Designs, Defense Documents, Doc's Dissections, E-Books, FAQs, In the News Archives, Research Articles, Sensible Science, Scripturally Speaking, Tough Texts, and Home Study Courses. You can even listen to A.P. radio spots by clicking on "Examine the Evidence." One can also link to our children's site, "Discovery for Kids." All of the material contained in each section is easily searchable using our lightening fast search engine. What is more, these categories provide material that is free of charge. We invite you to take advantage of this vast array of free information.

For many years we have endeavored to be a leading resource that people go to in the field of Christian apologetics. If our Web statistics are any indication, we have, indeed, begun to accomplish that goal. In 2005, we launched a Spanish version of our Web site (http://www.apologeticspress.org/espanol/) that has already begun to mushroom, as our materials are swiftly being translated for the growing Spanish-speaking population. We are excited and encouraged by this tremendous growth. We look forward to making this year even better as we continue to offer valuable material to truth seekers all over the world. If you have not visited our site lately, we encourage you to "surf" on in. We think you will like what you find.

REFERENCE

Clemmer, Jim (n.d.), "Practical Leadership," [On-line], URL: http://www.clemmer.net/excerpts/tunnel_vision.shtml.

Brad Harrub &
Dave Miller