Creation Matters

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Eugenics Leader A.E. Wiggam Was a Disciple of Darwin

by Jerry Bergman, Ph.D.

One of the most important 20th century advocates of eugenics in America was Dr. Albert Edward Wiggam (1871–1957). His many books sold millions of copies and still can be found in bookstores, both the reprinted editions and used copies. Wiggam also published widely in many of the leading popular and professional journals of his day. His syndicated column *Let's Explore your Mind* had a newspaper audience of approximately 20 million readers at the peak of its popularity (Wiggam, 1948, p. vii).

He also worked closely with such eminent persons as Dr. Willard Funk of Funk and Wagnalls. Although his major goal was to make eugenics acceptable to the masses, he aggressively argued that the discoveries of modern science, especially Darwinism, necessitated that we change our religious beliefs to include Darwin theology, an idea that, aside from eugenics, he preached incessantly (Wiggam, 1922; 1924; 1927; 1931).

Wiggam's work was also supported by leading scientists from major American universities, as documented by the fact that he was a leader in the *American Association for the Advancement of Science* (AAAS) and published in prestigious university presses (Black, 2003, p. 99). Wiggam received support by no less a eugenicist than Charles Darwin's son, Leonard Darwin, as well as John Dewey, Charles Davenport, and Thomas Hunt Morgan.

Finding support for eugenics

Wiggam's basic belief was that "all men are born unequal" and the claim that "one man is as good as another" is false (Wiggam, 1932, p. 491). He added that these differences in humans exist at birth and are not caused by the environment. He argued that tests can determine if a child has musical talent and, if he does not, it is useless for the child to study music (Wiggam quoted in Whitehead, 1931, p. 11).

Wiggam (1932, p. 491) concluded that scientists who study humans find that

> …nothing is more obvious than that all men are unequal; they are born unequal; they will always be unequal; nature intended them to be unequal; and no system of government, social control, or education has yet been devised or ever will be devised, that will make them equal. Indeed, the astonishing and delightful discovery of modern psychology and biology is that the more you educate men the more unequal you make them. The more you equalize opportunity, the more you unequalize men. The more nearly you treat

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Matters of Fact... Pinning a Tale on Our Ancestors?

by Jean K. Lightner, DVM, MS

Editor's note: You may submit your question to Dr. Jean Lightner at jean@creationresearch.org. It will not be possible to provide an answer for each question, but she will choose those which have a broad appeal and lend themselves to relatively short answers.

Q Is it true that the human tailbone is useless and proves that humans descended from an ancestor with a tail?

A The human "tailbone," or coccyx, usually consists of four bones, though it can vary in individuals from three to five. After birth, the coccyx ossifies (changes from soft tissue to bony tissue) and, eventually, the bones fuse, beginning at the bottom. The joint between the first and second bones is the last to fuse, generally fusing by the age of thirty. Sometimes the coccyx will fuse with the sacrum, the fused vertebral bones directly above it (Standring, 2008).

And it is certainly not useless. The human coccyx was designed to meet the needs of a human. It serves to anchor important muscles, which attach to the front, back, and tip of the coccyx. It plays a role in allowing us to walk upright and in providing support to keep our intestines in place within our abdomen while we do so. It is important that it be of the proper size, shape, and position so that we can sit comfortably, eliminate waste, and, for a woman, give birth to a baby.

Since the human coccyx shows evidence of design specifically for the needs of humans, there is no reason to believe we inherited it from a tail-wagging ancestor. It is far more logical to believe that it was given to us by an all-wise Creator.

Q Does the human embryo have a tail? Is the rare appearance of a tail on a newborn a re-expression of the tail from our ancestors?

A Early in embryonic development humans appear to have a "tail." This occurs because the vertebral column forms earlier than the hind limbs. The vertebral column and associated spinal cord grow relatively faster than surrounding tissues, extending past them and curling at the end. Later, the hind limbs form at a relatively fast rate compared to the spine that is already formed. This results in the vertebrae retracting and an empty casing of tissue remaining at the end. Normally this tissue is broken down by apoptosis, an important process used numerous times in

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Pinning a Tale?

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development to remove tissues that are no longer needed (Carlson, 1999).

The rare appearance of a "tail" on a newborn is the result of the tissue not breaking down after the vertebral column has retracted. So, unlike the real tail of an animal, this human "tail" has no bones or muscles. Its appearance signals a problem occurring in normal development, and is often accompanied by other spinal abnormalities. Its relevance to human origins was addressed by Cai, et al. (2011) in a recent case report:

> Thus, the presence of human tail can be considered a disturbance in the development of the embryo but not a regression in the evolutionary process.

Fortunately, the associated abnormalities are often relatively minor and the appendage can be surgically removed, allowing the child to live a normal life.

Q Is the human extensor coccygis muscle [aka, the dorsal (posterior) sacrococcygeus muscle] the remnant of a muscle that was used to move the tail in our ancestors?

A The idea that our ancestors had tails is a belief based on an evolutionary worldview. There are no historical records to support this view; it is merely conjecture. This does bring up an interesting topic, though. Why did God create this muscle and what purpose does it serve?

The name *extensor coccygis* was given to the muscle because it is in a position where it would be expected to extend the coccyx, or tailbone. It is not found in all adults. Since the bones of the coccyx are fused in most adults, the muscle presumably cannot move the coccyx. This is the basis for changing its name to *dorsal sacrococcygeus*, and for assuming that it is an evolutionary leftover.

Muscles can have several functions. They can move joints and/or stabilize them. Since the joints in the coccyx often don't finish fusing until adulthood, either or both functions are a possibility during the early years of a person's life. It is interesting to note that the position of the coccyx (angle of the bones relative to one another) appears to be a factor that can predispose an individual to pain in this region (coccygodynia; Postacchini and Massobrio 1983; Kim and Suk 1999), so it is quite possible this muscle plays a role in maintaining the proper position of the coccyx.

In a biblical world view it is important to recognize that the world has been affected by the Curse (Genesis 3; Romans 8:20–21). Therefore, the fact that some adults do not have the dorsal sacrococcygeus muscle could be attributable to degenerative loss. In other words, there may have been heritable damage to the genes controlling its formation, so it no longer forms as it should. If so, it would appear that other muscles and ligaments in the area normally compensate for its loss. Conversely, there is some variation in anatomy between normal individuals, so the possibility that its absence is normal variation cannot be ruled out, based on current knowledge of this poorly studied muscle.

Despite the attempts of some imaginative people to try to pin a tail on our ancestors, the human tailbone is evidence of a wise Creator who designed it and the surrounding structures in a way to specifically meet human needs.

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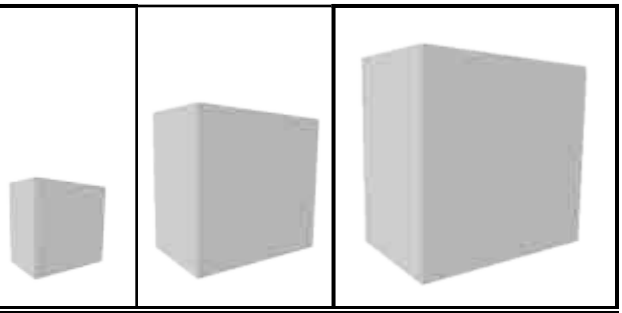
Body Size Matters

In *Two New Sciences*, Galileo (1638) wrote about mathematical designs displayed by animals. John B. S. Haldane later wrote a classic essay on animal design titled "On Being the Right Size" (1926). He considered the size, structure, and behavior of animals as constrained by mathematical and physical laws. For example, the amount of heat leaving an animal's body is very critical to its health. If heat loss is too great, starvation or pneumonia may result, a particular danger for small creatures. If the heat loss is too little, internal temperature may rise and cause heat stroke, a concern for large animals.

Consider three cubes with increasing edge lengths of 1 cm, 10 cm, and 100 cm. Table 1 compares their respective outside surface areas (A), internal volumes (V), and area-to-volume ratios (A/V). It is apparent that the smaller cubes have a relatively larger surface area when compared with their volumes. The A/V ratio is 100 times greater for the smallest cube than for the largest cube.

Now apply the area-volume comparison to the animal world. Let's consider a small mammal such as a mouse (represented by the smallest cube), and a large mammal such as an elephant (represented by the largest cube). The mouse faces two major hazards because of its relatively large skin area compared to its internal volume. The first is getting wet which, by doubling its weight, could greatly hinder its movement, making the mouse an easier victim for predators. But for the elephant, because of its relatively small surface area compared to volume, getting wet adds no substantial weight.

Table 1.
A comparison of the outside surface areas, inner volumes, and area/volume A/V ratios for three cubes with increasing size (not drawn to scale).



Length of side (cm)	1	10	100
Surface area, A (cm^2)	6	600	60,000
Volume, V (cm^3)	1	1,000	1,000,000
Ratio, A / V	6	0.6	0.06

A second hazard is the loss of body heat. A mouse loses a large amount of heat because of its high A/V ratio; therefore, it must eat disproportionately more to compensate for the energy loss. An adult laboratory mouse will eat approximately 15% of its body weight per day of a pelleted, cereal based diet (Anonymous, 2006). At this rate, an average sized human would have to eat over 22 pounds of Wheaties! Because of the smaller A/V ratio, a human will survive on just a few pounds per day.

A large animal faces hazards far different from a mouse or bird; two concerns will be mentioned. First, because of the small A/V ratio and the resulting lower rate of heat loss, large animals could potentially encounter a life-threatening increase in internal body temperature. This is avoided by a lifestyle of slow, graceful movements. Elephants also are provided with loose, baggy skin and large ears to increase their surface area for heat radiation.

Secondly, gravity can present a hazard to an elephant that risks injury if it stumbles and falls. Even a one-foot drop off a ledge can break a bone or otherwise injure a large animal. In sharp contrast, a mouse may fall hundreds of feet without injury.

Small and large animals are contrasted in Table 2. What does all this mean? Simply that every creature shows purpose and design, planned by its Maker.

Table 2.
Several design considerations for small and large animals based on the ratios of their surface areas to internal volumes (A/V).

Animal examples	mouse, bird, squirrel	elephant, whale warm-blooded dinosaur
Relative A / V ratio	large	small
Surface features	fur small ears	loose skin, no fur large ears back plates (stegosaurus)
Activity and metabolism	rapid movement rapid pulse high basal metabolic rate	sluggish movement slow pulse low basal metabolic rate

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men alike, the more unlike they become.

The view that eradication of the weaker humans and races was a major source of evolutionary advancement was well expressed by Wiggam (1922, p. 102) when he wrote that humans, at one time,

> …had scarcely more brains than his anthropoid cousins, the apes. But, by kicking, biting, fighting, outmaneuvering and outwitting his enemies and by the fact that the ones who had not sense and strength enough to do this were killed off, man's brain became enormous and he waxed both in wisdom and agility if not in size and morals.

In a work titled *Evolution, Genetics, and Eugenics* the editor, professor Horatio Newman (1932), included a chapter by Wiggam (1932, p. 495) that claimed the differences among races "are almost entirely due to their differences in natural power and aptitudes."

Debating Darrow

Wiggam not only published articles to spread his gospel of eugenics, but he was also active in public speaking and debating. In a debate on environment vs. heredity with famous attorney Clarence Darrow, Wiggam, in harmony with his eugenic beliefs, argued for heredity. He was convinced "that the great mass of the people live and die in poverty … due to the fact that ignorance has procreated ignorance for generation after generation" (quoted in Whitehead, 1931, p. 14). As evidence of this claim Wiggam (quoted in Whitehead, 1931, pp. 14-15) cited a study by Stanford Professor Lewis Terman to support his eugenic arguments. The study examined almost 1,000 gifted California children, all of which

> …were taken from the public schools, but not one came from a lowly laborer's home. And of 62 men in the Hall of Fame, 25 percent were found to be of the same blood as the 1,000 children. "In Arizona and New Mexico … we find a large number of invalids who have gone there for their health's sake. We find these tubercular strains daily producing more and more tubercular children even in this climate known to be especially inimical to the disease.

Wiggam claimed that these superior children were the result of eugenics and that the way to get "healthy children is by permitting only healthy parents to breed." As evidence of this conclusion he stated (quoted in Whitehead, 1931, pp. 14-15)

> …if we trace the ancestry of our outstanding individuals, we will never fail to find indubitable proof that the qualities that make them great were present in large degree in the men and women of whose blood they came. Only four out of 100 great Americans, chosen at random, came from lowly parents. The rest came from parents who had demonstrated intelligence in various ways. I submit this as pertinent proof of the overwhelming influence that heredity has upon the differences of men.

In other words, the solution to our social problems is eugenics — superior people need to have more children, and inferior people fewer children. Wiggam (quoted in Whitehead, 1931, p. 16) concluded:

> Modern civilization has defeated itself biologically. It has given the best of the laboring classes a chance to rise to wealth — where they stop having children. That is the most discouraging phenomenon of history. "In the germ cells are contained the abilities which enable the individual to rise above his environment. That is heredity. It is the only optimistic doctrine the human race can face today."

Even crime was based on heredity, and Wiggam (quoted in Whitehead, 1931, p. 15) cited several examples that he argued documented "how heredity passes a strain of crime down through several generations." Examples of "a good strain of blood" included "the long line that produced from the same ancestry Winston Churchill, General U.S. Grant, Mrs. Theodore Roosevelt, Dr. George E. Vincent and Grover Cleveland."

Using religion to support eugenics

Rather than citing only scientific studies to bolster his conclusions, Wiggam had a keen sense of using religious rhetoric to make his ideas appealing to the masses (Rosen, 2004, p. 130). In fact, Wiggam was "more persuasive in describing eugenics as God's plan" than any other person in America (Rosen, 2004, p. 128). He even "invoked Jesus to justify his own revision" of religion to convince the masses to accept eugenics (Rosen, 2004, p. 129). The real golden rule, Wiggam (1925, pp. 110-111) stressed, is a "new commandment" namely

> …the Biological Golden Rule, the complete Golden Rule of science. Do unto both the born and unborn as you would have both the born and the unborn do unto you.

Wiggam then concluded that eugenics "furnishes the final program for the completed Christianization of mankind ... this, and this only, is the final reconciliation of science and the Bible." Wiggam (Black, 2003, p. 99) also wrote "had Jesus been among us, he would have been president of the First Eugenic Congress." Wiggan's eugenic campaign in the churches was so active that he was often referred to as a "religious leader" (Gallagher, 1999, p. 36).

In the end, Wiggam (1948, p. 324) concluded that it is "only through science that man can have either an intelligent religion or intelligent morals." And he argued that it is only through eugenics that we can produce these intelligent and moral persons. He reasoned (Wiggam, 1948, p. 334) that the science of eugenics has resulted from "the new revelations from biology — the science of life — and proposes … a happier and more worth-while ideal." Eugenists propose that "the environment shall be so managed and utilized that they will result in the gradual improvement of man himself in his inborn traits of body, spirit, and mind". Wiggam (1948, p. 334) then added that eugenicists

> …wish first of all, to build a better world — a world of greater wealth and comfort, we see no sense in having an improved race if such a race has to live in the jungle — either the jungle of raw nature or the more hideous jungle of the slums of our great cities.

Eugenics, he went on to claim (Wiggam, 1948, p. 334), aims for the control of every aspect of society, including

> …our economy, politics, education, social philosophy, and religion … [and] can be so managed and directed that those who are the more successful in righteously creating and obtaining the richer rewards of such a society shall have the majority — indeed, the *very great majority* — of the world's children. Since the biologists have demonstrated that these traits of mind and character … tend strongly to be inherited by the children, the race would thus gradually

move toward higher and higher levels of biological virtue and excellence.

Summary

Dr. Albert Edward Wiggam was one of the most important popularizers of eugenics in America during the last century. His popular newspaper column and best selling books reached millions of readers, and he was widely regarded as a leading scholar by both academia and the public. His support for eugenics was based on the work of leading scientists of his day.

In the end Wiggam's movement and ideas have failed. His ideas are considered abhorrent today, and his name is usually unknown to all but eugenic historians and used-book aficionados. The application of eugenics to society by the government was manifested in the Nazi holocaust's murdering of not only six million Jews, but six million Slavic people and millions of other innocent humans, resulting in the loss of over 65 million lives (Lukas, 1997).

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Speaking of Science

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

Evolution Is Impossible to Falsify

Serious problems have been reported for Darwinian evolution that should have long ago swept his theory into the scientific dustbin of unworkable hypothesis. Yet neo-Darwinism survives, stronger than ever — strong enough to exclude any other alternative from the scientific competition. How can this be? A recent article shows how.

National Geographic News[1] just reported the discovery of a fossil tiger skull from China, the earliest ever known, claimed to be 2.5 million years old. That's a substantial leap back in evolutionary time from the previous record-holder at 1.8 million years old. Yet it looks strikingly modern, about halfway in size between a jaguar skull and a tiger skull. One might think this to be a problem for evolutionary theory, which would predict a sequence of transitional forms from pre-tigers to tigers. But here's the headline: "Oldest Tiger-like Skull Yet — Hints **Evolution Got It Right From Start**."

The headline should start several scientific sirens. In the first place, evolution is not a thinking entity even capable of trying to get something right. And evolution has no standard of rightness. But if *National Geographic* meant that it was a pure gamble — that chance hit a lucky strike by an unguided process — the statement could mean nothing short of a miracle. To see if that is what was implied, the article can interpret itself.

- Representing a new species, the **skull isn't that different from those of modern tigers**, suggesting **evolution hit on a winning formula early on and stuck with it.**
- The National Evolutionary Synthesis Center's Julie Meachen said the skull's **similarity to those of living tigers and jaguars** is more striking than the differences.
- "[Big cats] were **great at what they did right away in their evolution, so their [anatomy] hasn't changed much** ...," she said. "They were — and still are — really good predators, in part because of their **extremely successful body plan**."

No statement in the short article suggested any problem with this fossil for evolutionary theory. In fact, they celebrated it as a trophy for evolution. And this is why evolution is impossible to falsify — no matter what is found, one can contrive an evolutionary story to explain it.

1. Mosher, D. (2011, October 18). Oldest tiger-like skull yet — hints evolution got it right from the start. *National Geographic.* Retrieved October 19, 2011, from http://news.nationalgeographic.com/news/2011/10/111018-fossil-tiger-skull-panthera-science-oldest-china-evolution/

Enjoy Your Body Gifts

When you eat right and exercise to do your body good, you may have little idea how much your body is giving back all the time. From recent scientific discoveries, here's a look at a few mechanisms under our skin that not only keep us alive, but provide us with a shopping mall of good things.

Shock absorbers: Without tendons we could not handle a basketball game or even the stresses of ordinary activity. *ScienceDaily*[1] reported on work at Brown University about how our limbs respond to sudden stresses. "Experiments showed that **tendons absorb the**

initial burst of energy from impact before the leg muscles react," the article said, based on work they did with turkeys, which have similar tendon-muscle groups as we do. "**The tendons act as shock absorbers, protecting the leg muscle from damage** at the moment of impact."

An illustration accompanying the article shows a turkey coming in for a landing. The tendons first provide a "fast stretch" like coiled springs before the muscles absorb the blow. Then, as the muscles do their part about a tenth of a second later, the tendons continue with a "slow stretch," shunting the energy they absorbed to the muscles. The result is a soft landing that would otherwise cause serious damage. "It is becoming increasingly apparent that **springy tendons are a big part of what makes us go**," said one of the university biologists. The article stated that "The research **may cross into biomimetics**, used to make two-legged robot locomotion more similar to human locomotion, for example. It could even help in athletic training." Another biologist gave us reason for thanks: "**We can say that in real ways, the muscle has a safety net with the tendon there and protecting it**."

Colon police: We rely on microbes to help us digest our food, but there are good guys and bad guys in our inner subway tunnels. Fortunately, we have agents patrolling the corridors and checking their credentials. *LiveScience*[2] reported on work at the Washington University Medical School in St. Louis. The researchers hypothesize that a special population of white blood cells called Treg cells learns how to tell the good guys from the bad. If future work bears this out, it may become possible to help patients with autoimmune disorders by re-training cells to recognize and tolerate "self."

Ear amplifiers: The motor protein prestin in the cochlea is part of an elaborate amplification system that lets us enjoy all the nuances of music. Sound pressure waves can be extremely faint, even after the eardrum and ossicles do their part to amplify them. Inside the cochlea, further amplification is needed. To get a feeling of how astonishing the mechanisms are inside those coiled organs inside your head, try to follow this abstract by Weddell *et al.* from *Current Biology*[3] (see footnote for glossary of terms):

> The **sensory hair cells** of amniote hearing organs are usually **distributed** in tonotopic array from **low to high frequencies** and are **very sensitively and sharply tuned to acoustic stimulation**. Frequency **tuning** and tonotopicity of **non-mammalian** auditory hair cells is due largely to **intrinsic properties of the hair cells**, but **frequency tuning** and tonotopic **organisation** of the **mammalian cochlea** has an **extrinsic** basis in the **basilar membrane** (BM); a **spiralling ribbon of collagen-rich extracellular matrix** that **decreases in stiffness from the high-frequency base of the cochlea to the low-frequency apex**. **Sensitive frequency tuning is due to amplification**, which specifically boosts low-level input to the mechanosensitive hair cells at their tonotopic location **to overcome viscous damping**….
>
> In the **mammalian cochlea**, amplification is the remit of **the sensory-motor outer hair cells** (OHCs), located within the **organ of Corti** to **exercise maximum mechanical effect** on the motion of the BM and **transmit** cochlear responses to the **adjacent sensory inner hair cells** (IHCs) and, consequently, to the **auditory nerve**… **OHCs behave like piezoelectric actuators, developing forces along their long axis in response to changes in membrane potential**. These forces are due to **voltage-dependent conformational changes** in the **motor molecule prestin**, which is densely distributed in the OHC lateral membranes.

Remember that when you listen to your favorite music. The authors did not mention evolution except to speculate briefly in the last paragraph:

> We conclude that **prestin evolved** in the mammalian cochlea **to provide the basis** for the **amplified, impedance-matching mechanical link** that enabled the OHCs of the organ of Corti to devolve responsibility for frequency tuning to the potentially enormous frequency range of the graded mechanical properties of the BM. In this **scenario**, prestin provides **the rapid, voltage-dependent conformational changes** that **amplify** and closely **couple** the movements of the BM to those of the OHCs, as part of a mechanosensory feedback loop, and the **essential mechanical link** between the movements of the BM and the excitatory shear of the IHCs. **Prestin** is therefore the **key molecular element** that has **enabled** the organ of Corti of the mammalian cochlea to **exploit** a mechanically-tuned extracellular matrix **to provide mammals with the enormous apparent benefit of being able to listen to frequencies way beyond the auditory ranges of other amniotes.**

Poison protection: Your body has mechanisms to protect you from low levels of carbon monoxide poisoning (*PhysOrg*[4]). Normally, CO binds to haemproteins readily, but when a haemprotein senses carbon monoxide's presence, "it changes its structure through a burst of energy and the carbon monoxide molecule struggles to bind with it at these low concentrations." A researcher at the University of Manchester remarked, "This mechanism of linking the CO binding process to a highly unfavourable energetic change in the haemprotein's structure provides an elegant means by which organisms avoid being poisoned by carbon monoxide derived from natural metabolic processes."

Cleanup crew: As a baby develops in the womb, and the stem cells differentiate into tissues and organs, a lot of cleanup is required. *PhysOrg*[5] reported that "The body rids itself of damage when it really matters." Not only are there molecular machines called proteasomes to clean up damaged proteins, there are other mechanisms to rejuvenate cells from inherited damage and give them a fresh start. A researcher at the University of Gothenburg said, "**Quite unexpectedly** we found that the **level of protein**

damage was relatively high in the embryo's unspecified cells, but **then it decreased dramatically**. A few days after the onset of cell differentiation, the protein **damage level had gone down by 80–90 percent**. We think this is a result of the damaged material being broken down" by these mechanisms.

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2. Welsh, J. (2011, September 26). Friend or foe? The colon knows 'good' bacteria from 'bad.' *LiveScience.* Retrieved October 19, 2011, from www.livescience.com/16226-gut-immunity-bacteria.html

3. Weddell, T.D., M. Mellado-Lagarde, V.A. Lukashkina, A.N. Lukashkin, J. Zuo, and I.J. Russell. 2011. Prestin links extrinsic tuning to neural excitation in the mammalian cochlea. *Current Biology* 21(18):R682–R683. ***Glossary:*** **amniotes**: egg-bearing animals. **tonotopic**: relating tone to location. **viscous damping**: the tendency for vibrations to lose energy in fluid. **piezoelectric**: producing an electric charge upon stimulation or compression.

4. University of Manchester (2011, September 20). Scientists reveal how organisms avoid carbon monoxide poisoning. *PhysOrg.* Retrieved October 19, 2011, from www.physorg.com/news/2011-09-scientists-reveal-carbon-monoxide-poisoning.html

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Mercury Messenger: Surprise!

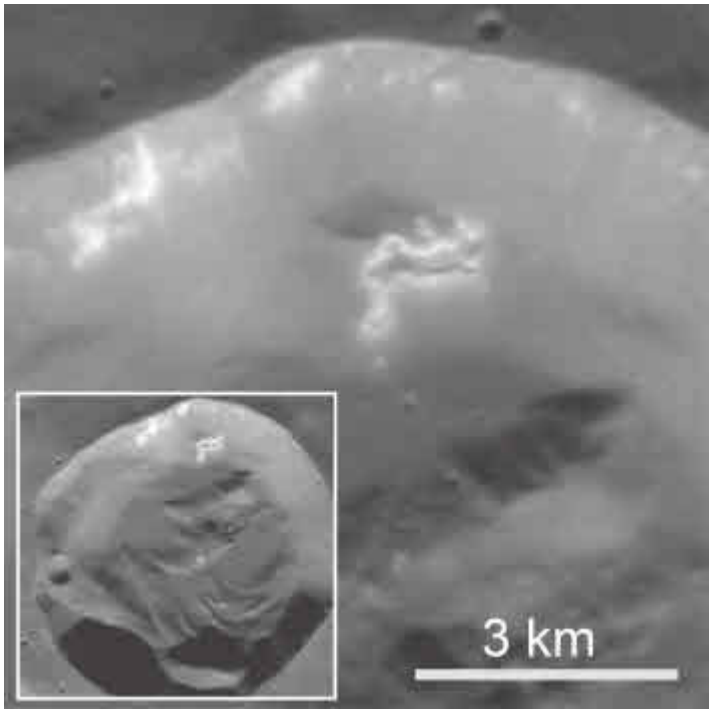
As boring as the moon? Just a burned-out cinder? Not Mercury. True to tradition for planetary exploration, the MESSENGER spacecraft has served up a plate of surprises about the innermost planet. In orbit since March, the ship is sending theorists back to the drawing board to figure out a number of puzzling phenomena, some unique to Mercury. Commentators fall into two categories: those who are flabbergasted, and those who say all is well.

Science magazine recently published the first seven papers since the orbital tour began. Here were the headlines that appeared on various news outlets:

- *ScienceDaily*[1]: "**Mercury Not Like Other Planets**, MESSENGER Find"
- *PhysOrg*[2]: "**Epic volcanic activity** flooded Mercury's north polar region"
- *BBC News*[3]: " 'Hollows' mark Mercury's surface." The article begins, "Hands up who thought Mercury was **just a dull rock circling close to the Sun?** The latest data returned by Nasa's Messenger probe shows **that view couldn't be further from the truth**."
- *National Geographic*[4]: "Mercury 'Hollows' Found — Pits **May Be Solar System First**"
- *NewScientist*[5]: "Bright 'hollows' on Mercury are **unique in solar system**"
- *Space.com*[6]: "**Planet Mercury Full of Strange Surprises**"

By contrast, Richard Kerr's summary article in *Science*[7] was titled, calmly, "**Mercury Looking Less Exotic, More a Member of the Family.**" Judging from abstracts and reports, the following discoveries seem the most interesting:

- **Hollows:** The hollows spoken of are unique structures found within some craters. Irregular in shape and up to miles across, these depressions with sharp rims, often found in clusters and found across Mercury, appear to be collapse pits — as if volatile substances escaped from underground and caused surfaces to fall. The closest analogues are on Mars, where similarly shaped features result from sublimation of ice at the poles; but here on Mercury there is no ice. *ScienceDaily*[1] called it "**an unexpected class of landform** on Mercury and suggest that **a previously unrecognized geological process** is responsible for its formation."



This high-resolution view shows a small, fresh 15-km-diameter impact crater (inset) at a high northern latitude on Mercury. Bright material is exposed on the upper part of the south-facing wall, and hollows are present on a section of the wall that has slumped partway down toward the floor.

Image credit: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington. Presented September 29, 2011, at a NASA press briefing.

NewScientist[5] said of them, "**They may have been formed by processes still active today**, and **change our view of the small rocky planet's history.**" *ScienceDaily*[1] quoted a scientist who believes they are actively forming today — further evidence that "**Mercury is radically different from the Moon in just about every way we can measure.**" *National Geographic*[4] quoted David Blewett (Johns Hopkins): "The **old thinking** was, Oh, Mercury, it's an **old burned-out cinder and not so interesting**…[But now] **here's this jaw-dropping thing that nobody ever predicted.**"

- **Sulfur:** *Space.com*[6] introduced this surprise: "Mercury is **not just hellishly hot** but apparently **covered in brimstone**. A vast part of the planet is covered with **dried lava** — enough to **bury the state of Texas under 4 miles** of the stuff, scientists say." Richard Kerr in *Science*[7] said "**Surprisingly**, it has **10 times the sulfur of Earth's rock.**"

- **Reducing conditions:** Mercury doesn't fit another expectation. Richard Kerr explained, "The combination of high sulfur and low iron in Mercury's rock **must have come from minerals** that **could have existed only** if Mercury formed under chemically **reducing** conditions. **That sounds**

bizarre, because all the other rocky planets formed under the opposite conditions: **oxidizing** ones." He was quick to find a scientist who "showed that probably only water-free, organics-rich, comet-dust-like stuff **would have survived** near the sun to make Mercury. With no oxygen atoms from water around, reducing conditions would have prevailed." Still, it makes Mercury a special case compared to nearby Venus and Earth.

- **Potassium:** *ScienceDaily*[1] explained why elevated potassium levels seen on the surface is a challenge to explain: "Measurements of Mercury's surface by MESSENGER's X-Ray and Gamma-Ray Spectrometers also reveal **substantially higher abundances of sulfur and potassium than previously predicted.** Both elements **vaporize** at relatively low temperatures, and **their abundances thus rule out several popular scenarios** in which Mercury experienced extreme high-temperature events early in its history."

- **Lava flows:** Evidence of volcanism had been observed on the previous three flybys, but the extent of lava plains exceeded expectations — some five million cubic kilometers. The *BBC News*[3] had a comparison some angry voters might like: "This is **enough lava to cover the City of Washington DC to a depth of over 26,000 km**, which is about 72 times higher than the orbit of the International Space Station." Seen primarily in previously-unseen northern regions, the lava is thought to have oozed out of fissures, rather than coming from eruptive centers that produce familiar cone-shaped mountains.

Space.com[6] explained, "Based on the way this lava apparently eroded the underlying surface, the researchers suggest **it rushed out rapidly."** Lead scientist James Head (Brown U) thinks the flows date from billions of years ago, but remarked, "**We can't say** if it **took 2.7 days or 15 years** or any exact time from orbit, **but it wasn't hundreds of millions of years**." Why extensive volcanism would turn on like that, last a few years, and then stop — only to remain unchanged for billions of years — seems odd.

- **Magnetic field:** Of the rocky planets, only Earth and Mercury have global magnetic fields. Unlike other magnetic fields, Mercury has one that is only 3% offset from its polar axis, but is inexplicably displaced some 300 miles northward from the center of the planet. Mercury's is also much weaker than Earth's — too weak to provide protection from the solar wind. See *ScienceDaily*[1] for details.

ScienceDaily[1] began its coverage with this summary that emphasized the theoretical challenges:

> Only six months into its Mercury orbit, the tiny MESSENGER spacecraft has shown scientists that **Mercury doesn't conform to theory**. Its surface material composition **differs in important ways** from both those of the other terrestrial planets **and expectations prior** to the MESSENGER mission, **calling into question current theories for Mercury's formation**. Its **magnetic field** is **unlike any other in the Solar System**, and there are **huge expanses of volcanic plains** surrounding the north polar region of the planet and cover more than 6% of Mercury's surface…"**Theorists need to go back to the drawing board** on Mercury's formation," remarked the lead author of one of the papers, Carnegie's Larry Nittler. "**Most previous ideas about Mercury's chemistry are inconsistent with what we have actually measured** on the planet's surface."

ScienceDaily[1] ended with a quote by Sean Solomon: "**Mercury is not the planet described in the textbooks.** Although a true sibling of Venus, Mars, and Earth, **the innermost planet has had a much more exciting life than anyone predicted.**"

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...without excuse!

by Timothy R. Stout

Responses to the Testimony

I frequently visit university campuses to distribute free creation science literature. My most recent visits were to Purdue University and the University of Illinois on consecutive days. After doing this many times over the years, I have learned that unless the Lord draws a person, he or she will not respond to the evidence, no matter how clearly it is presented. Here are two contrasting responses from my recent experiences on these two campuses.

The first encounter

Early in the morning at Purdue University, I offered a copy of the pamphlet, *How Science Shows There MUST Be A Creator* (Stout, 2010a), to a young man who was walking past me. He hesitantly took it and then said, "This is nonsense, you know." I asked if he had a science background and he said, "Yes." After getting permission to accompany him as he continued to walk, I presented a synopsis of material from my recent *Creation Matters* article, titled "The Testimony of Physical Life" (Stout, 2010b).

First, I mentioned that biological chemicals fall apart much faster than they could ever spontaneously appear. This behavior is the outworking of the laws of chemical equilibrium. Therefore, for a person to believe in a natural origin of life, he needs to reject the laws of chemical equilibrium. This is not a big deal to a person who does not understand these laws, but to one who does, it is major.

Next, I asked him to consider the very common enzyme, *succinate dehydrogenase*, which is comprised of a string of over 1,100 amino acids. The probability of getting this particular amino acid sequence, by chance, are 1 in $10^{1,100}$. If a person is honest, he must acknowledge that these odds are impossible to overcome in practice. Natural selection would be useless in gradually bringing about its initial formation, because natural selection does not choose between the better of two failures. Therefore, to believe in a natural origin of life a person needs to ignore the laws of statistics. This, again, is not a big deal to a person who does not understand these laws, but to one who does, it is major.

Then, I challenged him to consider information-driven machines. A living cell is essentially an information-driven machine, one which requires certain major components to function properly and reliably from the very beginning. For instance, from the beginning there must already be a very large body of properly working, debugged code (information). Yet, this code has absolutely zero value unless there exists, simultaneously, a fully functioning, highly reliable decoder, which is extremely complex in itself. There further needs to be a fully functioning energy system to drive the decoder. Other fully functional components could be enumerated.

Finally, I emphasized that this cell, an information-driven machine, must have *all* of these components performing properly right from the very beginning, not gradually over time. Otherwise, it does not work, period, end of story. This is the exact *opposite* of a gradualistic evolutionary processes. Therefore, to believe in a natural origin of life, a person needs to reject basic principles of information-driven machines. Once more, this is not a big deal to a person who does not understand these principles, but to one who does, it is major.

I concluded that science, therefore, shows us that natural processes work against an evolutionary origin of life; they do not promote it. Therefore, if physical life is not the result of natural processes, its origin must be from supernatural processes. In other words, science shows us why physical life requires a Creator.

He seemed taken aback. Then he asked, "Are these things discussed in the pamphlet?" I acknowledged that they were. He indicated that he would read the pamphlet much more carefully than he initially intended and continued on his way. We had perhaps walked 200 feet together, but this short a distance was all it took to show him that God designed the universe in such a way that it reveals Him as the Creator. The evidence is so powerful that anyone can see it who is willing. Indeed, a person is *without* excuse who suppresses the truth and does not see how the creation reveals the Creator (Romans 1:18-20). Praise God for His wisdom in designing a universe which so effectively reveals Himself!

The contrasting response

The next day, at the University of Illinois, I used the same approach with another student. He also had a science background and was a committed evolutionist. He acknowledged each point I made. However, his final comment was, "So what." With that, he refused a pamphlet and walked off. He appeared to be the typical evolutionist/atheist who is so committed to his position that he will never acknowledge the validity of any contradictory evidence, no matter its strength.

People with this mindset typically discount any evidence presented against their position by telling themselves, "Since evolution is true, I know you are wrong. We just haven't learned the answer yet. In the meantime, I have better things to do with my time than to listen to you." How sad. I pictured him at the coming day when he will bow down before the Lord Jesus Christ, acknowledging Christ's Lordship to the glory of God the Father. But, for him it would be too late, he would be appearing for judgment, not rewards. How I wished there were something I could have said to him to awaken him to the Truth.

We strive to have answers to refute those who oppose our Lord. We try to make the message as clear as possible. We strive to represent the Lord in a way that honors Him. Yet, we can never forget that we are totally dependent upon Him to create light out of the darkness of an ungodly heart (2 Corinthians 4:6). We can present the evidence, but only God can make it take root and grow (1 Corinthians 3:7). Because of these truths, we need to be relying on God to work in the hearts of those to whom we speak, to make things clear, and not to rely on our own efforts.

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All by Design

Rat Poison

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

The Bible teaches that the Lord God created and provides for the needs of all animals. It follows that He has endowed each creature with the things it needs to survive.

The African crested rat, *Lophiomys imhausi*, is no exception to this principle. It turns out that these rats taste good, at least to the jackals and wild cats that share their habitat. However, these rats have a cunning trick. They chew the bark of the poison-arrow tree, and then slather the foamy mixture upon the special black-and-white crest hairs of their flanks.

The poison in this bark is strong enough to kill an elephant, and indigenous peoples have used it to coat their arrows. If a predator makes the mistake of attacking the rat, it freezes and turns its flanks towards its assailant. The hairs themselves are specially designed with thousands of microscopic pores that absorb the poison much like the wick of a candle. Any bite directed towards the flanks of this rodent is likely to be a predator's last. And what is more, the rats are themselves completely immune to the deadly poison!

Who taught these fascinating rodents to chew the bark of this particular tree, and to apply the saliva mixture to this specific set of hairs? Who designed these wick-like hairs in such a peculiar way, and programmed the rat's metabolism and behavior to render the poison harmless to itself? Let us not ascribe this to the blind chance of evolution, but rather to the wisdom of a Mighty Creator.

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Image credit

Lophiomys imhausi, 1866, from Nouvelles Archives du Muséum d'histoire Naturelle (US public domain, Wikimedia Commons)

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