

# Creation Matters

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## Cryptozoology and Creation Apologetics

by Dave Woetzel

The term *cryptozoology* was coined by Bernard Heuvelmans (who has come to be called “The Father of Cryptozoology”) in the late 1950s. It comes from three Greek words: *kryptos* (“hidden”) + *zoon* (“animal”) + *logos* (“discourse”), which combine to yield “the science of hidden animals.”

A more precise way of stating this would be that cryptozoology is the investigation and gathering of evidence supporting the existence of organisms that have not been described by science. The unknown creatures themselves are known as *cryptids*, a word first proposed by John Wall of Manitoba, Canada in 1983.<sup>1</sup> The word *cryptozoology* has now become a part of modern vocabulary.

In recent years, interest in this field has

spiked, as shows from National Geographic, History Channel, and others feature regular episodes on monster hunting. The sensational nature of some of these productions (presenting dinosaurian cryptid research, alongside paranormal experiences and supposed alien encounters) has dismayed serious researchers and placed the whole field in a dubious light. However, there continues to be progress in the work of documenting “hidden animals.”

### Cryptozoology successes

Perhaps the two best-known species that were thought to be extinct, but then were found in recent history, are the megamouth shark and the coelacanth. In 1976, a naval research vessel working in the Hawaiian Islands caught a previously unknown animal

when it hauled in its large anchor. The 1,653-pound shark was called “mega-mouth” because of its large, toothy oral cavity.

The coelacanth was supposed to have been extinct for about 70 million years, until a fisherman caught one off the coast of South Africa in 1939.<sup>2</sup> In the last two decades, new species of deer, lemur, and marmoset have been found. Only discovered by western science in 1992, the Saola,

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## The Thyroid: From Vestigial Organ to Critical Gland

by Jerry Bergman, Ph.D.

The thyroid in humans is a bilobed gland, connected by a narrow isthmus, located just inferior to the larynx (Marieb and Hoehn, 2014, p. 533). The eminent German evolutionist Ernst Haeckel concluded that, not only is the thyroid vestigial, but that our body contains

... many rudimentary organs... I will only cite the remarkable thyroid gland (*thyreoidea*), the rudiment of the crop and the remnant of the ciliated groove (hypobranchial groove) present in Chordonia, Ascidia, and Arania, on the lower part of the gill-body (1879, p. 438).

Because surgeons found that adults could survive after having part or most of their thyroid glands removed, it was widely assumed that the thyroid was a useless organ. Tröhler (2010, p. 13) wrote:

...as physiologists had been unable to determine a function for the thyroid, surgeons of the time assumed it had none, and so some removed the gland in its entirety.”

Although German anatomist and authority on vestigial organs, Professor Robert Wiedersheim, classified the thy-

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# Thyroid Gland

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roid as vestigial, he recognized that “it develops into a large, highly vascular organ,” indicating it has a function. Wiedersheim concluded that “nothing very definite is known concerning its functions,” but he speculated that it removed substances from the blood that are “injurious to the nervous system” (1895, p. 163).

Actually, in the 1890s the thyroid was known to have several important functions, due to the research of Dr. Theodor Kocher (1841–1917). Before his research, surgeons commonly removed the thyroid in cases of an enlarged thyroid, called a goiter. It was not yet fully understood that a goiter is often a result of iodine deficiency, which causes the thyroid to enlarge in an attempt to produce its hormones in sufficient quantity for the body’s needs. Large goiters could push against the windpipe, making breathing very difficult (Jæger, 1988, p. 241).

## Discovering Its Importance

As a devout Moravian, Kocher accepted his church’s central beliefs, which included the teaching that according to Genesis, God’s creation is perfect. For this reason Kocher believed that no useless body organs exist. As a result, so

...convinced was Kocher that the thyroid had important functions, that from 1883 onwards he began implanting human thyroid tissue in thyroidectomy patients in an attempt to

replace the loss of the postulated functions. In doing so, he became the pioneer of organ transplants (Tröhler, 2010, p. 14).

In Bern, Switzerland where Kocher worked, goiter was endemic due to low levels of iodine in the food and water. Putting aside his belief that all organs were created for a purpose, and were thus functional, he succumbed to the prevailing wisdom of his time, and in many cases had completely ablated the thyroid gland. One day he made an unexpected discovery that caused him to believe that the thyroid was critical, both in maintaining health and normal development. This discovery would change medicine forever.

In 1874, Kocher performed a complete thyroidectomy on a young girl. He examined her again in early 1883, and realized that, in the following decade, she had become cretinoid, a condition causing major stunting of both physical and mental development. The difference between the patient and her younger sister was now enormous. The younger sister became an attractive, normal-sized young woman, but her sibling remained small and exhibited “the ugly looks of a semi idiot” (Tröhler, 2010, p. 13). As young girls, the two sisters had been so similar that they often were confused with each other.

After this discovery, Kocher thought about his creation belief and decided to contact the 102 patients on whom he had performed thyroidectomies since 1872, in his long and very productive surgical career.

He was able to contact 77 patients, and soon noticed that a major difference existed between the 28 patients in whom he had performed a partial removal of the gland, and the 24 in whom the gland had been completely ablated. While those patients in the partial removal group were all in good health, by contrast, only two of the complete removal group showed an improvement (Tröhler, 2010, p. 13).

His data were, at that time, the largest reported sample of patients on whom any one surgeon had operated. Although Kocher’s conclusions from his study of these 102 patients, plus 134 other cases that he had also evaluated, were clear, his colleagues’ reactions were mixed. Many of his peers were unreceptive to the new information, concluding that the early stages of cretinism included thyroid enlargement. His critics also believed that the disease Tröhler identified, *cachexia strumipriva*, was merely a late stage of cretinism that had developed despite removal of the thyroid (Tröhler, 2010, p. 13). More research has completely vindicated Kocher, who was awarded a Nobel Prize in 1909 for his work in this area.

## Its Many Functions

The thyroid gland is now known to secrete several hormones that are essential to normal body growth in both infancy and childhood. In humans, the thyroid is one of the largest endocrine glands, weighing up to 20 grams in adults. Its hormones affect almost every cell in the body (Marieb and Hoehn, 2014, pp. 534–535). The gland’s three most

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important hormones are triiodothyronine (T3) and thyroxine (T4), both of which regulate metabolism, and the hormone calcitonin, which helps to regulate calcium levels (Marieb and Hoehn, 2014, p. 534). Both T3 and T4 stimulate the mitochondria to provide more energy for the body and to increase protein synthesis.

Without T3 and T4, humans become sluggish, and normal growth and development are interrupted. An oversupply (or an undersupply) of thyroxin results in over-activity (or under-activity) of many organs. Developmental defects in this organ cause the hideous deformity known as cretinism that results in severe retardation of both

physical and mental development (Levy et al., 1964, p. 663). After full body growth is achieved, the gland's functions are less critical, and can partly be compensated for by other organs.

### Conclusion

The thyroid gland was at one time considered to be a vestigial organ. Inspired by his religious upbringing, Dr. Kocher conducted the investigations which led to the discovery that this gland is, in fact, essential for normal human development. This is one of many examples where the application of the creation principle in Genesis has motivated scientific advances.

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# Pre-Biological Fitness — The Water Cycle

by Michael G. Windheuser, Ph.D.

The western shore of the island of Hawaii has the perfect conditions for growing coffee. Overnight hours are clear and cool on the slopes of Mauna Kea. Daylight brings the radiant heat of the sun which warms the upper layer of the ocean and causes evaporation during the day. The warm moist air is swept upwards from the coast, cooling and condensing first as clouds, and then falling as a gentle rain on coffee plantations below. The water eventually finds its way through the volcanic soil back to the ocean, and the cycle begins again. This daily water cycle is a small picture of the global water cycle which happens each day.

Water makes our planet habitable and life possible. It does so through many unique properties, one of which is its ability to both absorb and dispense heat energy. The water, or hydrologic, cycle is one key way that heat is moved from warm climates to colder ones, helping to maintain worldwide temperatures within the small range suitable for life (Wiker and Witt, 2006). It takes a large amount of energy to raise the temperature of water by one degree. This is energy that would otherwise be warming the environment, but is captured by water.

In addition, it takes an extraordinary amount of energy to cause water to vaporize or change from liquid to a gas. Just as perspiration cools our skin by evaporation,

the evaporation from the world's oceans absorbs a tremendous amount of heat, which is subsequently carried to colder latitudes or higher altitudes where the water vapor condenses into liquid water. As water vapor condenses, it releases the same amount of heat it absorbed during evaporation. This warms up colder climates. Something similar happens when water freezes and thaws. Melting ice absorbs a huge amount of heat energy which is subsequently released when liquid water freezes.

Water is the perfect compound to absorb, store, circulate, and dispense heat on a worldwide basis. With 70% of the Earth covered with water, the moderating effects of water on local and worldwide climate can't be overstated. But these physical-chemical properties are what Wiker and Witt (2006) call "*pre-biological*" properties. That is, these abilities of water were present before life, yet are perfectly suited to support life on Earth — from the microscopic to the worldwide scale. Wiker and Witt (2006) see water as a thing of genius, consisting of only two elements and possessing "all the needed powers that complex and even intelligent life demand."

The water cycle is only one aspect of a range of powers resident within water, which powerfully reveal how the natural world was created with the *intent* to support intelligent life. Since by definition natural

selection requires a living organism capable of leaving offspring which may or may not survive, and water is part of the non-living world, it cannot be natural selection that is responsible for the properties of water. Rather, this type of pre-biological fitness for life means that the Creator of the earth and the universe had us in mind from the very beginning.

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- Wiker, B. and J. Witt. 2006. *A Meaningful World — How the Arts and Sciences Reveal the Genius of Nature*. InterVarsity Press. Downers Grove, IL.



## Cryptozoology ...continued from page 1

or forest-dwelling ox, is so different from any currently known species that a separate genus had to be constructed.

The giant squid that allegedly attacked sailing ships in the annals of ancient maritime lore was believed by many to be mythological. Numerous modern research efforts have tried to substantiate its existence. But in the fall of 2004, a live giant squid (*Architeuthis dux*), measuring roughly 25 feet long, attacked a baited fishing line off the Ogasawara Islands.<sup>3</sup> Japanese scientists released photographs of the bus-sized creature with eyes as large as dinner plates.

New species are still being discovered fairly regularly in remote places like Papua New Guinea and the Amazon basin of South America. Usually, these discoveries involve plants and small animals. But in 2009, as a result of an intense effort, a six-foot-long monitor lizard was found, photographed, and classified as a new species in the Philippines. One news reporter expressed bewilderment that it “is as long as a tall human, and lives in a heavily populated area of the Philippines. Yet somehow the giant lizard *Varanus bitatawa* has gone undetected by science until now.”<sup>4</sup>

### Cryptozoologists

A cryptozoologist is someone who systematically seeks to track down those species (or sub-species) that are still unknown to science. There are a number of remote regions where intriguing reports give cryptozoologists hope of finding a dinosaurian cryptid!<sup>5</sup> Success in the field of cryptozoology is part hard work, and part good fortune (or providential blessing). It typically involves traveling to remote locations, interviewing indigenous peoples, spending long hours observing in target areas, and sleuthing for clues. Simple things like animal droppings, hairs, feathers, eggshells, and footprints (like the claw marks on trees that helped researchers discover that large monitor lizard in the Philippines). Cryptozoological tools include advanced photographic equipment, night vision gear, sonar devices, game calls (especially if the quarry is a predator), various baits, and even flying drones.

French cryptozoologist Michel Raynal developed from Heuvelmans a methodology for how the existence of a particular kind of plant or animal can be established by accumulating testimonial evidence (ac-

counts of sightings), circumstantial evidence (indirect observations like footprints, nests, or droppings), or even autoptic (i.e., personally observed) evidence (like a photo which anybody can see).

While skeptics might be dubious of this kind of evidence, it would be well to remember that the same region of Africa from which we get reports of a living sauropod yielded the discovery of the elusive Okapi in 1901. Before that, it was only known to the outside world through the stories of tribal peoples. Cryptozoologists not only seek to establish the existence of famous “hidden creatures,” like the Loch Ness Monster or Big Foot, but also pursue stories of common animals in unexpected places, and new varieties of plants.

Although there are plenty of naysayers in the scientific community who argue that money could be better spent studying endangered species, there are defenders of cryptozoology as well. The late Grover Krantz, an anthropologist at Washington State University, maintained that even a fuzzy photograph, snapped by an overexcited layperson, can constitute important evidence and should be carefully considered by the scientific community.<sup>6</sup>

Joseph Gennaro, a biologist at New York University, pointed to the 1977 photo of Champ,<sup>7</sup> taken by Sandra Mansi, and stated, “The picture was subjected to all kinds of computer noise-elimination techniques to verify that it was not a floating log or a ripple, not turbulence, not wind current, not glare, not a fake—that it was actually a phenomenon that could not be explained by any critics of cryptozoology.”<sup>8</sup> Dr. Roy Mackal, a prominent cryptozoologist at the University of Chicago, investigated the Loch Ness phenomenon, and made multiple trips into the Congo searching for a sauropod. Mackal wrote the book *A Living Dinosaur?: In search of Mokele-Mbembe*.<sup>9</sup>

### Creationist efforts

Creationists have been strongly represented in the cryptozoologist ranks, particularly in the serious search for dinosaurian creatures. The reason for this, I believe, is twofold. First, creationists are far more inclined than are their counterparts in the mainstream scientific community, to believe that such creatures still exist. It is more plausible to envision relic species like dinosaurs existing in remote regions, if one believes they co-existed with man just a few thousand years ago, rather than being committed to the notion that men and dinosaurs have been separated by tens of millions of years’

evolution. Secondly, the creationists are quite interested in finding “living fossils” because of the potential value that such finds have in the origins debate.

As someone who has invested considerable time and resources into cryptozoological inquiries, particularly in pursuit of dinosaurian creatures, I am often asked why substantiating the existence of a living dinosaur would help creation apologetics. Dr. Philip Kitcher, in his anti-creationist book titled *Abusing Science*, claims that solid evidence that dinosaurs and man co-existed would “shake the foundations of evolutionary theory.”<sup>10</sup> Likewise, the Darwinist Arthur Strahler insists that

...it is conceivable that a scientist will some day discover human bones among dinosaur bones in such a relationship that it is judged highly likely that humans and dinosaurs lived at the same time. Such a finding would deal a crushing blow to the widely favored hypothesis of a unique evolutionary sequence. In Popper language, the hypothesis of evolution would be falsified.<sup>11</sup>

These are bold assertions. Some creationists also naively believe finding a dinosaur would be the silver bullet to slay the wolf of evolution. Unfortunately, the history of Darwinian theories suggests that all such evidence would quickly be assimilated into evolutionary theory. I believe that few, if any, committed evolutionists would change their minds when confronted with such a find.

History has shown that the plasticity of evolutionary theory permits it to accommodate nearly any scenario, making it unfalsifiable. Nonetheless, cryptozoological successes, like the 1994 discovery of the Wollemi Pine (a type of tree thought to have been extinct for millions of years), are useful for illustrating the speculative nature of evolutionary theory, and for casting doubt upon the transmutation of kinds over deep time.

Were Darwinists to do a 180-degree turn on dinosaurs, it would be a very public embarrassment, resulting in a significantly greater credibility problem. They would shift from a posture that dinosaurs were so unfit that they could not survive, to claiming that some were so fit that they survived till the present virtually unchanged! It would be considerably more dramatic than finding a lobe-finned fish like the coelacanth, still alive and hardly changed after millions of years. Natural history museums, national

parks, and the many magazine articles and books that prominently display dinosaurs would require modification because they currently state that men never co-existed with the great reptiles.

Evolutionists have capitalized on the popularity of dinosaurs to sell their theories, especially to young people. Evolutionist Sean Carroll wrote, “Dinosaurs are the poster children of evolution, and they inspire the vast majority of those who touch them.”<sup>12</sup> Discovering a living dinosaur would help creationists reclaim the reptiles to the glory of our great Creator. For example, it would give credence to the many historical accounts of men encountering dragons.

Finding a living, breathing, dinosaurian creature similar to the specimens in the fossil record would bring into question the reliability of other Darwinian stories. If evolutionists can’t get something as simple as men and dinosaurs being separated by tens of millions of years correct, how can one trust them that men and mold share a common ancestor?

If a living dinosaurian specimen has only changed slightly in the supposed 60 million years since the fossils were buried, why did other dinosaurs evolve into birds? Worse yet, how did a tiny squirrel-like creature evolve all the way into a man during the same timeframe? Indeed, the evidence we do have suggests that any extant dinosaurians are smaller, and arguably less fit than were their fossilized ancestors. This points to degeneration, rather than evolution.

So, while committed evolutionists would surely argue that there are other creatures (like horseshoe crabs and crocodiles) that are “living relics,” still recognizable from the era of the dinosaurs. such a find would nonetheless be a public-relations boon for creationists. The weightier scientific arguments for intelligent design could then be brought to the public’s attention because of the increased interest.

## Dinosaurian cryptids

But what is the likelihood that a dinosaurian creature actually exists today? This is pretty difficult to assess. As much as many of us would like to see incontrovertible evidence (a readily observable population somewhere, a recently deceased corpse, or a captive living specimen) it is difficult to anticipate where such evidence will show up. Furthermore, we must be careful to maintain a healthy, scientific skepticism of

unverified claims, so that we don’t waste valuable resources or make statements that hurt our credibility.

I have personally invested over 20 years focusing on this particular subset of the origins debate, and my “short list” of possible cryptids has come about by requiring multiple lines of evidence that the hypothetical creatures exist, rather than a solitary claimed sighting. The credentials of the observer(s) are also a factor. I am particularly interested in having recent sightings.

## Possibilities

So, after leading dinosaurian hunting expeditions on six continents, I would like to give my personal opinion on the leading “hotspots” where relic species might one day be found:

Pterosaurs: In my opinion there is a good possibility that these creatures still exist in the Asia-Pacific region around Papua New Guinea (PNG). I hiked coastal islands of PNG during a three week expedition in 2004. After conducting numerous interviews, traveling extensively within the target area, photographing fascinating carvings, and personally observing an anomalous, nocturnal flying animal, I feel that this region holds great promise.<sup>13</sup> I would place the odds at 90% that there is a cryptid there, and about 70% odds that the creature they call “Ropen” is an extant pterosaur.

Dinosaurs: There are two regions where “dinosaur sightings” meet the criteria outlined above. One is in the western part of equatorial Africa (Cameroon and the Congo basin). In 2000, I conducted a reconnaissance trip into the African rainforest, slogging through the swamps and floating the jungle rivers. I came away favorably impressed with the likelihood of a sauropod dinosaur still living in that region.<sup>14</sup> On subsequent expeditions, associates have conducted follow-up research, which has included photography of nesting sites, and taking casts of footprints.

I would say that there is a 70% chance that there is some hitherto unidentified reptilian creature alive there, and 60% odds that it is indeed a dinosaur. The likelihood of confirming this is not as good as it is for the Ropen, in my judgment, but additional expeditions are well worth pursuing.

In 2015, I traveled to Lake Murray in the highlands of PNG, near the Indonesian border, where there are reports of a large theropod dinosaur still living amid the swamps and islands. After conducting interviews over multiple days, I was satisfied with the credibility of the eye witnesses.<sup>15</sup> This remains an active area of research, as nationals have now been employed to survey the remote regions of the lake, seeking locations where the creatures might be found with regularity.

Plesiosaurs: There are any number of “sea monster” sightings, and numerous deep lakes where visitors regularly report seeing strange reptilian creatures. After having been to many such locations and interviewing eye witnesses, I would say that the odds of clearly discovering such a creature are lower than for the above two categories. My most-likely lake monster candidate would be Ogotogo, followed by Champ, and then the Loch Ness Monster.

I actually observed the Ogotogo phenomenon in Lake Okanagan, British Columbia, in 2011. While I am certain that there is a large creature lurking there, I cannot say that it is reptilian, and I doubt very much that it is a plesiosaur. My estimate would be only about 50% that a creature like Champ actually is a plesiosaur. It is somewhat more likely that in the immensity of the oceans, some such creature persists. Perhaps we might someday be fortunate enough to run across a corpse, or a baby cryptid that is easily captured, but the chances seem to be remote.

## Conclusion

Some creationists have questioned whether the investment of time, effort, and funds into cryptozoological endeavors is a wise use of our apologetics resources. I believe that these efforts quite possibly could yield substantial fruit. To turn a phrase from David Livingstone, the end of the cryptozoological feat is only the beginning of the enterprise.<sup>16</sup>

Just as Livingstone’s explorations opened doors for the gospel and helped end the slave trade, so I believe that the discovery of a living dinosaurian creature, in one of these remote regions, would provide a forum for the truth of creation, hasten the eventual demise of evolution, and open



doors for evangelism.

In summary, I think that cryptozoological work holds considerable promise for creationists. Man's natural fascination with these great reptiles is no accident. God designed dinosaurs to display his power. Indeed, that is the message of Job 40–41. When Job's faith in God faltered, the Lord commanded him to "Behold now Behemoth!" (40:1). Later, God stated of Leviathan: "None is so fierce that he dare stir him up; Who then is he that can stand before me?" (41:10). Dinosaurs, rather than being a showpiece for evolutionary propaganda, should remind people of the greatness of our Creator. It is my hope and prayer that this will be accomplished in some measure in the near future by the discovery of one of these awe-inspiring creatures.

## Acknowledgement

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- 14 See Woetzel, D. 2001. Behemoth or bust: an expedition into Cameroon investigating reports of a sauropod dinosaur. *Journal of Creation* 15(2):62–68.
- 15 Woetzel, D. 2015. The cryptid of Lake Murray — a Living Theropod? *Creation Matters* 20(3):2.
- 16 Murray, I.H. 1971. *The Puritan Hope*. Banner of Truth: Carlisle, PA, p.179. [Livingstone actually said, "Viewed in relation to my calling, the end of the geographical feat is only the beginning of the enterprise."]

GM

## Matters of Fact

by

Jean K. Lightner, DVM, MS

## Animals on the Ark

*Editor's note: You may submit your question to Dr. Jean Lightner at [jean@creationresearch.org](mailto: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 Why do some calculations show that the Ark was not big enough for all the animals?

A Because they don't use realistic figures... There are several obvious problems with calculations that make it appear there was not enough room on the Ark. They generally are based on estimates of how many species live in the world today (e.g., Moore, 1983). This is unrealistic for a variety of reasons.

First, the estimates often include animals that are fully aquatic. This clearly contradicts Scripture, which specifies the groups of animals on the Ark as corresponding to the flying creatures created on day 5, and the land animals created on day 6 (Genesis 1:20–28; 7:14, 21–23; 8:17). Moore (1983) ignores this reality, claiming that Genesis 7:4, 23 require even marine animals

to be on the Ark. Apparently Moore doesn't comprehend the modifying phrase "the face of the earth" which clearly excludes animals inhabiting aquatic environments.

Second, they use species instead of kinds. When I was in school, I was told that a species designation was very specific. It would seem that they should be stable and not change in one's lifetime, especially since speciation supposedly takes a very long time. However, this is not the case. Species is a man-made classification that doesn't have consistent criteria (Understanding Evolution, n.d.). Taxonomists often change their minds about what belongs in a particular species, genus, and even family (Lightner, 2015). Gene flow between separate species is often found at hybrid contact zones. Because of this, different species can coalesce into one; other times, the hybrids may diverge into new species (Grant and Grant, 2008; Grant and Grant, 2009; Grant and Grant, 2014).

The types of changes that occur during speciation and hybridization are consistent with animals reproducing and filling the

earth (Genesis 1:22; 8:17). Therefore, it is illogical to believe that modern species and created kinds are equivalent. Instead, the process of speciation is a by-product of the created kinds' reproducing and filling the earth after the global Flood. Suggestions that species today are essentially equivalent to the kinds mentioned in the Bible will grossly overestimate what Noah needed to take on board the Ark.

Some skeptics have criticized the concept of kinds. It is true that the science of baraminology is fairly new, and that we have a lot of work to more clearly delineate many of the boundaries on various kinds. However, reasonable approximations for the number of kinds have been made for most vertebrates, the animals of significant size which must be accounted for in estimating the appropriateness of the size of the Ark. Currently, there are estimates of mammals (Lightner, 2012), birds (Lightner, 2013), reptiles (Hennigan, 2014a; Hennigan 2014b; Hennigan, 2015), and amphibians (Hennigan, 2013a; Hennigan 2013b; Ross 2014). We are still awaiting estimates that

include extinct flying creatures and extinct reptiles, but from what is observed so far, the number of vertebrates that must be accounted for comes to a few thousand kinds.

Third, invertebrates need to be considered separately. The vast majority of animal species alive today are invertebrates (~97% according to the Center for Biological Diversity). While they are clearly important, the kinds that are not fully aquatic would still not have a large impact on the required size of the Ark. It seems that skeptics include estimates of invertebrate species so they can spout off large numbers of animals, thus failing to estimate reasonable space requirements. An earlier creationist response, which clearly overestimated the vertebrates, found no problem with the size of the Ark (Woodmorappe, 1996). Thus, including invertebrate kinds, given that significantly fewer vertebrate animals were actually on board, should not be a problem.

In the end, all realistic estimates show that the dimensions for the Ark, as detailed in the Bible, are very reasonable, providing adequate space to carry all the kinds of animals specified by God. There is no

miraculous intervention that needs to be invoked to fit them into the available space.

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(photo by Dr. Gary Locklair)

# ...without excuse! THE TESTIMONY OF THE INHERITED CELL

by Timothy R. Stout

In an earlier *Creation Matters* article, I discussed how an information-driven system must make a single-step first appearance (Stout, 2013). Computers and living cells are both examples of such systems. A large body of information must be stored in a medium. The information must be in fully-working form, from the beginning. At the same time, there must be a hardware mechanism capable of accurately reading the information from the medium, accurately decoding it, and correctly using it to accomplish a task. Neither the information nor the hardware has value unless the other is also present. Thus, the first appearance of both the mechanism and the information must occur in a single step, with both in fully functioning form.

Since by definition evolution is a process of gradual changes spread over many steps, evolution is by definition the opposite of a single-step appearance. An information-driven machine is irreducibly complex; therefore, evolutionary processes cannot bring about the initial appearance of an information-driven machine. Both of its essential elements (viz., information and mechanism) must make a single-step, simultaneous, initial appearance.

Generally, the lay person assumes that the amount of information stored in a cell's DNA is sufficient to fully define its structure and operation. Actually, though, this is not the case. according to an article in *BioScience* (Johnson and Lam, 2010). These authors explain the situation by citing two issues, both of which are relevant to our discussion:

To put the importance of the cell into perspective, we begin with two facts certainly known to all biologists: First, genes do not code for the construction of cells; a cell must be inherited, as are the genes, from a parent. Second, the cell's mechanisms, independent altogether of the influence of DNA, are enormously complex.

The first of the "two facts" reported in the article repeatedly emphasizes that the physical structure of a cell must be inherited, since there is insufficient information in the genes to code for its construction. Accordingly, the authors state that

... genes do not code for the construction of cells; a cell must be

inherited, as are the genes, from a parent.

Because the cell must be inherited, and because its processes cannot always be constructed de novo from genetic instructions...

Further, such genetic information would be useless without a fully functional membrane, inherited from a parent, on which to act...

This is a problem for abiogenesis because of the second of the two issues: "The cell's mechanisms..." (and implied, the structures to implement them) "are enormously complex." In other words, the apparatus that needs to be inherited is not trivial. There is a number of complicated processes which are interdependent; they all need to appear for the first time in working form, along with a mechanism to replicate them.

For instance, it does a cell no good to have a nutrient metabolism system without an energy production system to drive it. This logically leads to the conclusion that the entire first cell must have made a single-step, first appearance. This first cell would have included the cell's genetic information, the medium in which to store it, and the cellular structures (i.e., mechanisms) for all the minimally-required functions for proper cell operation and replication.

Richard Dawkins, the well-known atheist/evolutionist, discusses the unrealistic nature of single-step appearances in his book, *The Blind Watchmaker*. According to his calculations, even something as simple as correctly generating the phrase, "METHINKS IT IS LIKE A WEASEL," in a single step, using the simple desktop computer he had in the 1990s, would take, on the average, a million, million, million, million, million years. This, he says, is a million, million, million times as long as the universe has so far existed. However, a cell is much more complicated than this phrase. As a result, he concludes that, "If evolutionary progress had had to rely on single-step selection, it would never have got anywhere" (Dawkins, 1996, p. 49).

The *Bioscience* article's authors further explain that many cellular components self-assemble. The self-assembly is performed by inherited cellular structure; it is not coded for in the genes. Hence, the genes do not

contain all of the information required to build a cell; that which is lacking is supplied by the inherited cellular structure.

The problem is that there is no natural source to provide the information or the apparatus required for the first appearance of a living cell. A plausible means to bridge the gap between a self-replicating molecule and the first living cell capable of inheritance is beyond comprehension; one cannot even speculate rationally about hypothetically feasible steps to make this possible. There is no scientific basis to assume that it is.

The implications of the observations reported in the *BioScience* article are obvious. Science, as we know it, currently teaches very clearly against the possibility of a natural, unguided origin of life. It is far more reasonable to attribute the appearance of life to a living Creator God, than it is to believe that a complete, fully-functioning cell could appear through unguided, random processes, in a single step. What is sad is that the facts reported in the article are stated to be "certainly known to all biologists." In the face of these observations, there is assuredly no excuse for the typical, open hostility of many biologists towards the Creator God and towards those who believe in Him.

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# Speaking of Science

## from the Creation-Evolution Headlines

by David F. Coppedge

*Editor's note: These S.O.S. (Speaking of Science) items have been selected from "Creation-Evolution Headlines" by David F. Coppedge at <http://crev.info> and are used by permission. Unless otherwise noted, emphasis is added in all quotes.*

### Tiny Organisms Control the World

An unexpected source that regulates global climate is found among the smallest of living things. In a piece entitled, "Sea Creatures Make Brighter Clouds to Cool the Earth," *LiveScience*<sup>1</sup> reports on research out of the University of Washington on the role of plankton in cloud formation, a major regulator of the climate.

Marine phytoplankton, which are **tiny organisms** that rely on light to grow and spread into globs in the ocean, **influence how clouds accumulate droplets**. Researchers found that the number of **droplets** over the Southern Ocean **nearly doubles during summer months** because the sun-loving plankton are more abundant then. **Clouds with more droplets are brighter** and able to **reflect more sunlight, preventing solar radiation** from reaching Earth, the scientists said.

The reflection of these droplets prevents excessive heating of the atmosphere. Although particles from volcanoes and industrial smoke can also form condensation nuclei for clouds, the waste products of marine algae fluctuate through the year, providing more bright droplets for clouds when they are needed most for cooling.

**Phytoplankton** — the **tiny, green algae** at the surface of the ocean — **produce airborne gases and organic matter** that form marine aerosols. During the **summer**, when phytoplankton **take advantage of the extra sunlight to proliferate**, the **wind** picks up water and **releases it into the atmosphere as sea spray**. This **enriched salty water enhances the ability of the sea spray aerosols to attract water droplets** that eventually condense into cloud droplets, [Daniel] McCoy said.

**The Invisible Jewels:** Speaking of small marine organisms, the light and magic show of tiny copepods (crustaceans) known as "sea sapphires" has been partly explained. *PhysOrg*<sup>2</sup> revealed the secrets in "The secret to the sea sapphire's colors—and invisibility" from work at the Weizmann Institute.

*Sapphirina*, or sea sapphire, has been called "the most beautiful animal you've never seen," and it could be **one of the most magical**. Some of the **tiny, little-known copepods** appear to **flash in and out of brilliantly colored blue, violet or red** existence. Now scientists are figuring out the trick to their hues and their invisibility. The findings appear in the *Journal of the American Chemical Society* and **could inspire the next generation of optical technologies**.

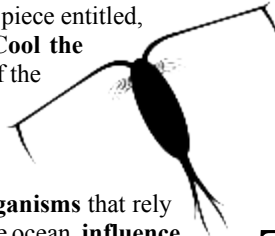
The invisibility trick appears to come from these animals' ability to shift the wavelength of their intensified reflections into the ultraviolet. Will invisibility cloaks for humans be coming down the line?

The researchers measured the light reflectance—which determines color—of live *Sapphirina* males and the **spacing between crystal layers**. They found that **changes of reflectance depended on the thickness of the spacing**. And for

at least one particular species, when light hits an animal at a 45-degree angle, reflectance **shifts out of the visible light range and into the ultraviolet, and it practically disappears**. Their results **could help inform the design of artificial photonic crystal structures**, which have **many potential uses in reflective coatings, optical mirrors and optical displays**.

As crustaceans, these marine animals possess compound eyes, a mouth and gut, an excretory system, swimming appendages, and sensory antennae. Only the males produce the brilliant colors and perform the invisibility trick.

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### Where Are the Earth's Impact Craters?

The number of impact craters on Earth is almost negligible compared to Mars and the moon. Can erosion explain this? Scientists have estimated that there must be about 340 undiscovered meteor craters on the Earth, *ScienceDaily* reports.<sup>1</sup> Only 188 have been observed so far.

Meteorite impacts have shaped the development of the Earth and life repeatedly in the past. The extinction of the dinosaurs, for instance, is thought to have been brought on by a megacollision at the end of the Cretaceous period. But **how many traces of large and small impacts have survived the test of time?** In comparison to the **more than 300,000 impact craters on Mars, the mere 188 confirmed craters on Earth seem almost negligible**. Moreover, **60 of them are buried under sediments. Advances in remote sensing have not led to the expected boom in crater discoveries:** An average of only one to two meteorite craters are discovered per year, most of them already heavily eroded.

The moon, we know, is heavily cratered. The explanation usually given is that plate tectonics and erosion on Earth erase our craters. Still, the low number is surprising—and sobering:

"**A surprising, initially sobering finding** we made was that **there are not many craters of above six kilometers in diameter left to discover** on the Earth's surface," reports [Stefan] Hergarten [U of Freiberg]. In the case of smaller craters, on the other hand, the scientists found the **current list to be far from complete:** Around 90 craters with a diameter of one to six kilometers and a further 250 with a diameter of 250 to 1000 meters are **still awaiting discovery**. While there are undoubtedly still a number [of] **undiscovered large craters buried deep under sediments**, they are much more difficult to detect and confirm.

It would seem that craters could be detected indirectly with seismic studies, shocked minerals, or meteoritic material in sediment facies. The short article was not specific in the methods used.

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... continued on p. 10

## Human Eye Has Nanoscale Resolution

No more complaining about bad design in the human eye. Optical experts prove it can distinguish differences at billionths of a meter. The Optical Society of America begins an article<sup>1</sup> debunking an alleged weakness in eye design:



**The human eye is an amazing instrument** and can accurately **distinguish between the tiniest, most subtle differences** in color. **Where human vision excels in one area, it seems to fall short in others**, such as perceiving minuscule details because of the **natural limitations of human optics**.

In a paper published in The Optical Society's new journal *Optica*, a research team from the University of Stuttgart, Germany and the University of Eastern Finland, Joensuu, Finland, has **harnessed the human eye's color-sensing strengths to give the eye the ability to distinguish** between objects that **differ in thickness by no more than a few nanometers** — about the thickness of a cell membrane or an individual virus.

The new-found ability of the naked eye may even be better than optical devices built to measure these differences:

**This ability to go beyond the diffraction limit** of the human eye was demonstrated by teaching a small group of volunteers to identify the **remarkably subtle color differences** in light that has passed through thin films of titanium dioxide under highly controlled and precise lighting conditions. The result was a remarkably consistent series of tests that **revealed a hitherto untapped potential, one that rivals sophisticated optics tools** that can measure such minute thicknesses, such as ellipsometry.

“We were able to demonstrate that **the unaided human eye is able to determine the thickness of a thin film** — materials only a few nanometers thick — **by simply observing the color** it presents under specific lighting conditions,” said Sandy Peterhänsel, University of Stuttgart, Germany and principal author on the paper. The actual testing was conducted at the University of Eastern Finland.

We've all seen the moving color patterns on soap bubbles. Those are examples of interference effects between layers of thin films. Knowing that some experts had a knack for correctly estimating thickness of these films, the researchers were inspired “**to test the limits of human vision** to see how small a variation could be detected **under ideal conditions.**” Optically, “**the spatial resolving power** of the human eye is **orders of magnitude too weak to directly characterize film thicknesses,**” they said, but the eye's perception of subtle color differences provides an indirect means of achieving nanoscale resolution.

How well did test participants do? Some could give answers in one to two minutes of observing, and got results within 1 to 3 nanometers of the measurements made by technical instruments.

**This level of precision is far beyond normal human vision.**

Compared to traditional automated methods of determining the thickness of a thin film, which can take five to ten minutes per sample using some techniques, **the human eye perfor-**

**mance compared very favorably.**

The researchers don't expect to replace instruments with human subjects; eyes can get tired easily, for one thing. But a skilled technician might be able to provide a quick check faster than a machine could. The article ends with praise for the eye and other human senses:

“The intention of our study never was solely to compare the human color vision to much more sophisticated methods,” noted Peterhänsel. “**Finding out how precise this approach can be** was the main motivation for our work.”

The researchers speculate that it **may be possible to detect even finer variations** if other control factors are put in place. “**People often underestimate human senses and their value in engineering and science. This experiment demonstrates that our natural born vision can achieve exceptional tasks that we normally would only assign to expensive and sophisticated machinery,**” concludes Peterhänsel.

1. OSA: The Optical Society (2015, July 9). Human color vision gives people the ability to see nanoscale differences. Retrieved July 22, 2015, from [www.osa.org/en-us/about\\_osa/newsroom/news\\_releases/2015/human\\_color\\_vision\\_gives\\_people\\_the\\_ability\\_to\\_see/](http://www.osa.org/en-us/about_osa/newsroom/news_releases/2015/human_color_vision_gives_people_the_ability_to_see/)

## Pluto Inbound Image Stuns Scientists

It's not a featureless orb: Pluto has a whale and a heart. A “complex and nuanced” surface shows that Pluto and its large moon Charon had a history.

New Horizons “phoned home” to say that it survived, according to *Space.com*.<sup>1</sup> We have this exclusive quote from Dr. Henry Richter (Caltech-JPL), the last surviving manager of Explorer 1 (Jan 31, 1958), America's first successful satellite. Richter, a pioneer of the American space program before NASA was formed, also was instrumental in designing the Deep Space Network that received the signals from Pluto today. He says:

The Pluto fly-by is another tremendous accomplishment. The development of such perfect reliability is amazing. To have that many components, to work perfectly after years of interplanetary travel shows the understanding of failure avoidance and superb engineering. This pretty much completes the detailed pictures of the major objects in the solar system. Kudos to the NASA staff.

This image has a 1,000 times the resolution of the Hubble Space Telescope. During its closest approach, New Horizons should have taken photos as detailed as 100 meters per pixel. If all goes well, data and photos will trickle down over the next 16 months, each bit taking 4.5 hours to travel the 3 billion miles between Pluto and Earth.

Alan Stern, principal investigator for the mission, shared some initial science findings.

- Pluto is larger than expected. Its newly measured radius of 1185 km means that the body is less dense than previously thought. This affects density models of its interior and lowers the altitude of the troposphere. Pluto regains its position as largest body in the Kuiper Belt.
- Nitrogen was found escaping much farther from Pluto than expected. Either the escape rate of gas is higher than predicted, or the transfer rate is different.
- It was confirmed that Pluto has a polar ice cap.

The paucity of large craters suggests resurfacing by some means. And what caused the differences between dark and light regions? That



## Boolean Algebra

**C** George Boole (1815–1864) was a British mathematician who helped establish symbolic logic, today also called Boolean Algebra. Boole was trained as a pastor with a special interest in origin studies. Tradition states that when he met someone on a train or in a shop whose conversation interested him, he was invited to his home to talk science and star gaze with his telescope (Newman, 1956, p. 1854).

Boole’s binary mathematical abilities were self-taught. Of special interest was the expression of logical statements in algebraic form including the operators AND, OR, and NOT. These terms are pervasive in literature search strings and also electronic digital

gates. Boole’s unique binary algebraic system waited more than a century until widespread application was found in the modern digital electronics revolution.

As one example of symbolic logic, consider two statements, A (Tom is young) and B (Tom is wise). George Boole’s friend Augustus De Morgan (1806-1871) then wrote the following rule,

$$\text{NOT (A AND B) = NOT (A) OR NOT (B)}$$



[https://commons.wikimedia.org/wiki/File:PSM\\_V17\\_D740\\_George\\_Boole.jpg](https://commons.wikimedia.org/wiki/File:PSM_V17_D740_George_Boole.jpg)  
[public domain]

That is, if it is not true that Tom is both young and wise (left side of expression), then either Tom is not young, or Tom is not wise, or neither (right side). There are many additional rules for symbolic logic.

Boole had great interest in the spiritual welfare of youth. In a particular sermon to young men he said, “Would that some part of the youthful enthusiasm of this present assembly might thus expend itself in labors of benevolence. Would that we could all feel the deep weight and truth of the Divine sentiment that ‘no man liveth to himself and no man dieth to himself,’” taken from Romans 14:7 (Graves, 1996, p. 130). Boole’s final words were the request that his five young daughters not fall under the influence of the liberal preachers of his day (Newman, 1996, p. 1854).

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question is sure to be a subject of great interest. The early montage photo shows that Charon has significantly different color and albedo than Pluto.

*Astrobiology Magazine*<sup>2</sup> is suggesting that Pluto may have icy plumes, perhaps like the geysers on Saturn’s moon Enceladus. Comparisons between Pluto and Titan, Saturn’s largest moon, and with Triton, Neptune’s active moon, are being made by *Space.com*.<sup>3</sup> In addition, the sharp boundaries between dark and light areas recall the brightness dichotomies on another Saturnian moon, Iapetus. Scientists hope to find answers to Titan’s apparent youth, because its atmosphere could not have lasted 4.5 billion years, *Space.com* says:

“It’s likely that **Titan’s current atmosphere is not sustainable over geologic time** — that is, on the order of billions of years,” [Michael] Wong [Caltech] told *Space.com* via email. “The current amount of methane in the atmosphere — the molecule that is responsible for the production of Titan’s haze and exciting organic compounds — **should not last for more than a few tens of millions of years.**”

So how does Wong account for it? “Climate change,” he quips. To keep Titan old, he imagines cycles of “snowball state” on Titan with re-injections of warming methane from time to time. But ten million years is just 1/450th the assumed age of Titan; can such a process keep repeating hundreds of times? That’s why Wong is looking to Pluto for clues. “**Pluto may be losing its atmosphere more rapidly than previously thought,**” *Space.com*<sup>4</sup> says, “offering a **tantalizing hint about its possible replenishment source.**”

Scientific analysis of Pluto will take months and years as the data

trickle in. For now, romantic types are enjoying the big heart shape seen on the inbound image (*PhysOrg*<sup>5</sup>). Marine biologists saw a whale shape in the dark areas. Even if these inbound images were all that came down, it represents a historic achievement that will fascinate scientists and the public for years. All the old Hubble photos have just been rendered obsolete except to historians. Pluto has become a world we know something more about.

Alan Stern and others have also celebrated the success of the American space program – the freedom and expertise that have allowed mankind to complete the first reconnaissance of the solar system within 51 years. Coincidentally, July 14 is the anniversary of the very first planetary encounter by Mariner 4 at Mars.

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

# The Enigmatic Remora

Today, let us consider the remora, a.k.a., sharksucker fish. Thought to be related to dolphin fish and cobia, remoras have a specialized suction disc on the tops of their heads. With these unique structures, they hold fast to larger marine animals, such as turtles, whales, and sharks. When their hosts eat, the remoras detach, clean up the leftovers, and then reattach to their hosts.



Amazingly, the suction disc is not present in remora hatchlings, which begin life with a normal dorsal fin. Early in development, the dorsal fin moves forward to the top of the head. The dorsal fin spines and associated bones flatten and widen out, much like the shape of a moose's antlers. Tiny spikes develop along the edges of the bones in order to grip their host.

Muscles then develop, connecting these bones to the top of the remora's skull, and a lip of loose skin forms around the edge of the suction disc to create a watertight seal. The remora can contract the muscles,

creating a very strong negative pressure, pulling it tightly to its host. The suction disc has formed by the time the remora is 3 cm long.

How could the remora have "determined" that this suction disc would be necessary in order for it to hitchhike through the seas; then, even more incredibly, as if by sheer will, actually develop a fully functioning structure?

And even if the remora could do so, why would it even go to the trouble of

developing such a bizarre structure if it already possessed a normal, functional dorsal fin? What it eventually comes down to is this: how can any living creature be cognizant of its need for a more specialized structure, and then proceed to develop it?

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