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Photo: James Hayward

Marine iguanas blend in with the lava rocks of the island. Exhaling salt from their noses colors their foreheads.

CREATION STORIES “THEN” and Creation Stories “Now”

BY BRIAN BULL

In the Galápagos Islands, a fascinating creature exists that is found there and nowhere else in the world. It is the marine iguana, a lizard that does not munch on cactus pads like the large yellow Galápagos land iguana to which it is genetically related.[1] The marine iguana eats only marine algae—seaweed. It is considerably smaller than the land iguana. It is dark grey or black in color; consequently, it warms up quickly in the sunshine. It sneezes salt crystals out of its nose!

How the marine iguana came to be, its creation story if you will, would run something like this. A few million years ago, there was nothing as far as the eye could see, nothing but water and endless nights following endless days. And then, out of the unbroken water came an explosion. It was an explosion of steam, lava, and ash. A volcano broke the surface of the Pacific Ocean. The lava and ash mixture cooled and, in time, with more volcanic explosions, an island began to form. The island grew in size as the endless days and nights continued.

Another day, it could have been very soon thereafter or thousands of years later, a raft of logs grounded on the island’s beach. The logs had been living trees that had tumbled into the ocean in a shoreline landslide off the coast of Chile some five weeks earlier. It ran aground on the island’s southeast-facing beach. Attached to that log raft was a jumble of vegetation. Most of the vegetation was dead due to the salt spray it had endured, and to a total lack of fresh water. However, among the dead and dying plants in the salt-soaked soil there was a beavertail cactus. Being a cactus with a waxy, protective coating over

the surface of its pads and having scant need for fresh water, it was still in reasonably good shape. The tide was high that day and there was an onshore wind. The cactus found itself on the decomposed volcanic ash just beyond the beach sand and several of its pads took root. Over the years that followed, it multiplied. Later, when another log raft from northern Chile bearing several iguana lizards grounded on that same beach there were cactus pads for them to eat. They ate and procreated, and the island now had cactus plants—and lizards, large yellow and brown iguanas, eating them.

Time went by, lots of it. And then, at the end of one dry season, the rains failed. The large yellow iguanas had nothing to eat; nothing. A few of the more adventurous among them found algae in the tide pools fringing the shoreline lava-flows. The algae was edible but it was very salty! Nonetheless, it tided them over until the rains returned and they could once again munch on the beavertail cactus pads. Change, however, was under way. A very few of the yellow land iguanas continued to eat the marine algae in the tide pools and as the tide went out each day some of the larger ones followed the retreating water until they were munching on algae under several feet of sea water. As time passed, and generation followed generation, these seaweed-eating iguanas shrank in size, turned almost black in color, and learned that waving their tails from side to side allowed them to swim in the waves that broke on the island's beaches.

That they turned darker in color than their fellow land iguanas was helpful in several ways; while immature, they could more easily hide from the hungry seabirds that ate other small lizards, and when fully grown, they were able to absorb the sun's heat more rapidly. Thus it was that they warmed up rapidly each morning. This was important, for, being poikilothermic, they needed to get their body temperature up before their jaw muscles would operate with reasonable efficiency on the underwater algae that grew on the ocean-bottom rocks. And that meant that they could gather more food during the ten minutes or so of each dive.[2] Like other lizards, they had salt glands in their nose that enabled them, by sneezing, to get rid of the huge excess of salt in their diet. As the lizards grew smaller and darker, those salt glands became larger and much more efficient.

And that, more-or-less, is the creation story of these fascinating creatures that live on these islands that are the peaks of undersea volcanoes. The islands themselves have existed for only a couple of millions of years, some for less than one million.[3] The smaller, almost black in color, marine iguanas are genetically related to the land iguanas that are to be found throughout the Galápagos islands. They are closely enough related that occasionally the offspring of a land iguana and a marine iguana is identified, a hybrid. The land iguanas, in turn, are genetically related to the land iguanas which populate the coastal regions of Chile. Not surprisingly, for six months each year the Humboldt current flows northwards from Chile towards the equator. It is a conveyor belt that will pick up flotsam and jetsam from the Chilean coast and, a few weeks later, strand some of it on the beaches of the Galápagos islands.[4]

"Duly Constituted Authority"

Let us undertake a further analysis of how the marine iguanas of the Galápagos Islands came to be and why they exist only in those islands. My account of how this probably occurred will likely be accepted as a reasonable explanation: an explanation of how these fascinating—and incredibly fierce-looking—creatures came to exist, when they came to exist, and why they are to be found on most of the larger Galápagos Islands and nowhere else in the world.

I am a research biologist and write mainly about hematology, about tests and measurements of blood cells, molecules, and diseases. Why might my account of how the marine iguanas came into existence be accepted as legitimate by most readers of this magazine? Two possible reasons come to mind:

1. In the course of telling this creation story I have referred to the work of scientists in fields as diverse as radioactive dating, reptile genetics, geomorphology, geology, volcanology, ecology, animal physiology, and several more as well. The data that these scientists have produced are empirical data: data derived from careful, well-documented, repeatable, and repeated experiments. I have cited the findings of these several scientists to back up my assertions. Given the documentation I have provided, my

assertions can reasonably be described as the "facts" of the emergence of the marine iguanas of the Galápagos as best as that process is presently understood.

2. I am a trained biologist. As such, I will likely be granted the status of "a constituted authority" by most readers when I comment on biological matters—and this is clearly a biological matter. Why might my assessment of matters biological, by most readers, be considered reliable? Likely, it is both because I have referenced the work of other biologists and because of my professional status. Thus, this creation story will gain its credibility both from the scientific "facts" I have referenced and from the selection, arrangement, and conclusions drawn from those citations by a "constituted authority." In this particular case, that would be me!

A tentative but likely conclusion follows. This modern creation story is probably more-or-less correct because of the facts it contains. Some of those facts are buttressed by scientific citations (scientific facts), others are being advanced by a trained biologist who, it is to be hoped, knows what he is talking about (facts attested to by a "constituted authority").

A Creation Story "Then"

"In the beginning God created the heavens and the earth."

That is how the biblical creation story begins. How it begins now. But was that the way it began then? Is that how those first listeners, three thousand years ago, would have heard it? That is a question shortly to be explored. In the meantime, it is the case that the "then" creation story explains how light, and then the "sky-vault" (Heb. *raqia*), and then how land and plants came to be, and days later how the first creatures appeared and began to populate the land and the sea. It also explains how birds appeared and began to fly across the "vault of the sky."

The "then" creation account is a factual story as well. It is full of details about the order in which events happened and about the events themselves. However, it differs from the "now" creation-of-marine-iguanas story in one very significant aspect. It is composed entirely of facts conveyed by a "constituted authority," it contains no empirical data arrived at by repeated experimentation. It lacks "scientific" details.

The lack of scientific facts is, of course, not at all surprising. Science was still 2,500 years in the future when the "then" creation story would have been heard by that first audience. It would therefore be expected that there would be no equivalent detail such as the effect of water temperature on the rapidity with which a lizard's jaws can function. (Reptiles are poikilothermic, their bodies quickly approach the temperature of their surroundings. For a marine iguana to survive it must swim out into the Humboldt current, dive beneath the cold ocean waters, hold its breath for ten minutes or so, and crop as much marine algae as possible in that brief period of time.[5]) There is no confirmation of the marine iguana's genetic similarity to other lizard species. There is no mention of the time that the island on which they live emerged from the ocean as determined by radioactive dating of the oldest lava flows on the island. In short, there are no "factual" data backed up empirically, arrived at by repeated and repeatable experiments. The obvious reason for this difference between then and now is that "then" was 3,000 years ago and the scientific approach to "finding things out" had not yet come into existence.

But both stories contain "factual" information. So

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how were "facts" ascertained before the scientific method of finding things out became commonly employed? It is surprising to us now in the twenty-first century, but for millennia past, "facts" were what we today would call personal opinion. It was the case, however, that it was not just anyone's personal opinion that was accepted as "fact." Only certain persons were accorded that privilege—persons in positions of authority; persons viewed in the community as persons of "constituted authority." In the ancient Hebrew culture, prophets and priests fulfilled this role when the questions being addressed involved religious matters

So, what is the portion in that creation story that is based on constituted authority and what part is based on scientific evidence, on empirical data. The answer, of course, is that all of the story is based on the constituted authority of the author. None of it is based on scientific fact. At no point in the story is empirical evidence adduced.

It will surprise some readers, but it is still the case today that factual documents may be based largely or entirely on facts attested to by constituted authority. These situations typically occur when the scientific approach is just not workable; it may even involve scientific procedures when the discussion relates to the format in which a procedure is to be presented and when it is to be used rather than how it is to be performed. An international body such as the World Health Organization (WHO) serves this purpose, as do others. I was, for a three-year term, the president of the International Commission for Standardization in Hematology (ICSH). It served as a "constituted authority" in the methods to be used for the testing of blood (hemoglobin content, hematocrit measurement, platelet count, etc.). The committee consisted of researchers in blood analysis, as well as representatives from manufacturers of automated instruments that required reference methods (developed and approved by our committee) for calibration. We reported to the WHO. Our constituted authority was enhanced by the WHO, since it clearly represented a higher level of authority, and in that way what our committee said should be done became the standard practice in blood analysis throughout the world. How the analytic methods functioned was, of course, science. Which methods were to be used and when they were to be used were decisions arrived at by ICSH committee members, acting under constituted authority.

When the "then" creation story was first heard, "facts" had not yet acquired their modern meaning. In his book *The Day the Universe Changed*, James Burke underscores the situation. He was describing the pre-scientific, medieval worldview. However, that a "constituted authority" is absolutely necessary in order to undergird "facts" was not only true in medieval times but also true two thousand years earlier. Burke comments:

> The concept of the generally accepted "fact" is a relatively new one. It came into existence only five hundred years ago as a result of an event that radically altered Western life because it made possible the standardization of opinion [science]. . . . What medieval man called "fact" we would call "opinion."[6]

Before the introduction of ascertaining a "fact" by repeatable experiment confirming that something is true empirically, "facts" were simply the written or orally expressed opinions of "constituted authorities." That was the only possible source for factual information. Nowadays, of course, we all accept it as a fact that airplanes can fly because of empirical (scientific) evidence, not because of a pronouncement from constituted authority—the Wright brothers, Orville and Wilbur.

This lack of scientific "facts," this entire reliance on "constituted authority," has been recognized by Bible translators ever since the dawn of science. We know that they have recognized that the Genesis account depends upon constituted authority with no reliance on science because in the process of translation they have repeatedly attempted to rectify the situation! They have, at almost every opportunity, tried to lessen the discontinuity, the divide between Genesis as usually read and science as commonly understood, by making the biblical account appear to be a blend of both "scientific" facts and facts affirmed by constituted authority.

It is entirely possible, even likely, that their word choices in the translation process occurred below the level of conscious awareness. The choices were made nonetheless, and a close examination of those choices will confirm that consistently during the last 500 years, each time the "then" story has been re-told in English (and presumably in other languages as well), translators have

chosen words that would make it seem more "scientific": words that would make it appear less than completely dependent upon constituted authority.

In almost all English translations, the first sentence of Genesis contains the English definite article, "the." It most often reads, "In *the* beginning." "The" is supplied by the translator; it is not present in the original Hebrew. Admittedly, the Hebrew does not smoothly slide into English. If translated word-for-word it would read something like "when beginning, " or "in beginning" God created. But the Hebrew text could easily be translated in other ways (without inserting the definite article). Other ways, that is, that would not so simply and smoothly inveigle an unwary reader to believe that the text was referring to the awesome singularity of the Big Bang. That, science assures us, was the event that initiated energy, space, and time—indeed all of reality, the beginning of all beginnings. The translator's choice to insert a "the" in the process of rendering the opening words of Genesis into English has had far-reaching consequences, indeed.

What *bereshith* meant to that first audience we cannot be sure, but we can be certain that it did not mean that they were about to hear how the space-time continuum popped into existence! Yet that is precisely how a considerable number of Bible readers have understood it. They have understood it this way because of the translator's choice to insert a "the" in front of "beginning." Admittedly, "to begin with" lacks the grandeur of **In The Beginning** but it more accurately conveys that, in Hebrew, the author is only undertaking to explain how the sky and the land of those he was addressing had come into existence.[7]

And then there is the matter of how to translate the Hebrew word *'erets*. Typical renderings would be "land" or, much less often, "earth." Even more rarely it is translated as territory, country, or region. It will be apparent to the reader that only one of these words can be mistaken for the name of the planet on which we live—the planet Earth. Early in Genesis (Chapters 1–11) translators have decided that *'erets* meant "earth" nine times out of ten. In the remainder of Genesis and the rest of the Hebrew Bible, they have chosen it three times out of every ten occurrences!

It is likely that they have made this dramatic about-face in deciding on the word because, when it is encountered early in the "then" creation story, it creates a patina of science around the narrative—the creation story could possibly be talking about our home planet, two and one-half millennia before anyone knew we lived on a sphere rotating in empty space—a sphere called Earth.

Statistically, the translator's change of heart as to what the Hebrew *'erets* actually means in English is even more surprising than these two dissimilar ratios (9:10 early, 3:10 late) would suggest. Uniformly, *'erets* in Genesis 1–11 is rendered "earth" in English, except when the translator's hand has been forced—where the translator has had no option. *'Erets* can only be translated as *land* in Hebrew sentences such as the *land* of Havilah, the *land* of Cush, and the *lands* belonging to tribes and peoples descended from Noah's three sons. To translate *'erets* as earth in such sentences is clearly not an option. Were the translators not forced to render *'erets* as land in twelve such sentences out of a total of ninety-six occurrences, it is highly likely they would have always rendered *'erets* as "earth" in Genesis 1–11.

That *'erets* means "land" and should be virtually always translated in that way is underscored by the promise to Abraham: "This land (*'erets*) I give to you and your descendants" and by the common appellation of the modern state of Israel; *'erets Israel*. That, of course, translates into English as "The *Land* of Israel."

Let us assume for the moment that translators in rendering the Genesis story from Hebrew into English have attempted in some measure to retell the story "scientifically." Let us suppose that they have translated it as if it were truly a blend of facts from duly constituted authority, as well as facts from scientific investigation. Assuming that they have done this, what has been the result?

The result of the translators' conscious or unconscious choice has been disastrous. It has, in large measure, both initiated and subsequently fueled the 500-year long discord between "science" and "religion." That is so because many of today's readers have accepted the notion that Genesis is a blend of facts from science and from constituted authority, rather than an account based entirely on the constituted authority of the author. This acceptance has led to an entire "creation edifice" made up of creation seminars, creation museums, creation research institutes, creation conferences, and more.[8] It has deepened the divide between science as commonly understood and Genesis as usually read.

So, what did the opening phrase of the "then" creation story actually promise? It promised a description of reality as it was conceived of 3,000 years ago. It

promises an account of how that reality had come into existence: the reality known by those who first heard the Genesis account. It promised to tell of the God who was concerned enough about humans to prepare the *land* and the *sky* for them, and to place in that sky a *light* to ensure that the land brought forth abundantly.

So, what, then, has the translation process mistakenly made it appear is on offer in the first sentence of that creation story?

"In the beginning God created the heavens and the earth."

This introductory sentence offers a creation story that will convey to the listener a blend of scientific information interwoven with factual information—the opinion of a constituted authority—about how the scientifically verified universe (heaven[s]), and the cosmological entities, our solar system and our home planet (earth) have come to be.

"To begin with God created the sky and the land."[9]

This introductory sentence offered a creation story that would convey factual information (the opinion of a duly constituted authority) about how the dome of the sky above each listener's head had come into existence and how the land underneath each listener's feet had come to be. It also revealed (introduced?) ethical monotheism—a good God committed to human flourishing.

So, after contemplating two creation stories, penned three millennia apart, where do we find ourselves? Looking back now on the more ancient of the two, it seems likely that translators, perhaps unknowingly, have tried to transmute it into a modern creation story as they have translated it from the Hebrew in which it was originally written. And so it is that an account that was written to explain to those first listeners *how* and why their familiar sky and land had been created has become transmuted into a *where* and *when* account of the universe, our solar system, and planet Earth.

The cosmological realities of universe, solar system and planet Earth were literally inconceivable to the ancient Hebrews to whom the message of Genesis was addressed. It was they who found the text immensely valuable as they understood it. It was valuable because it gave them relevant information about who God was, what God was doing, and what God wanted for them. It was they who began the labor-intensive process of copying it and so preserving it for posterity. If we too understand that we exist because a gracious God chose to make existence possible and further to ensure that humans would flourish upon the land, then we truly are the inheritors of that original creation story.

Endnotes

1. Amy MacLeod et al., "Hybridization Masks Speciation in Evolutionary History of the Galápagos Marine Iguana," *Proc. of the Royal Soc. B* (2015): 282.

2. Martin Wikelski and L. Michael Romero, "Body Size, Performance and Fitness in Galápagos Marine Iguanas," *Integr. Comp. Biol.* 43 (2003): 376–386.

3. MacLeod et al., "Hybridization Masks Speciation," 282.

4. M. Thiel et al., "The Humboldt Current System of Northern and Central Chile," *Oceanography and Marine Biology: An Annual Review* 45 (2007): 195–344.

5. G. A. Bartholemew, "A Field Study of Temperature Relations in the Galápagos Marine Iguana," *Copeia* (1966): 241–250.

6. James Burke, *The Day the Universe Changed*, (Boston, Toronto: Little, Brown and Company, 1985), 91.

7. Given the time and place, it is highly likely that the author of Genesis was male, whether he was named Moses or not.

8. Later in Genesis, the Flood account (Genesis 6–9) is often read as if it was a blend of scientific facts and facts from constituted authority. It is this mis-reading that undergirds the entire discipline of "flood geology."

9. Brian Bull and Fritz Guy, *God, Sky and Land: Genesis I As the Ancient Hebrews Heard It* (Roseville, CA: Adventist Forum, 2011), 27. This is the opening sentence of the OHV translation—the Original Hearer's Version—a translation presented in this book that utilizes the English words least likely to mislead today's reader into believing that the ancient biblical text is conveying empirical (scientific) information.

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