

The Ministry of Science

“Do you know when the mountain goats give birth?” Job 39:1

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The German-born British astronomer William Herschel (1738-1822) had surprising advice for his son John, who was struggling to figure out what to do with his life in Cambridge:

A clergyman . . . has time for the attainment of the more elegant branches of literature, for poetry, for music, for drawing, for natural history . . . for mathematics, for astronomy, for metaphysics, and for being an author upon any one subject in which . . . [he is] qualified to excel.¹

Those were the days. It is hard to imagine a time when pastors had the freedom to excel in the “more elegant branches” of study, including the sciences (theology was not on Herschel’s list). How strange that now seems when ministry, due to its relentless demands, can all too easily turn the pastor into a “quivering mass of availability.”² How strange that now seems when the cultural norm is to hold faith and science either at arm’s length or at each other’s throat.

Not so in the past. John Wesley considered the study of science (“natural philosophy”) to be wholly edifying for ministry. He chided young pastors with the following words:

Do I understand natural philosophy? If I have not gone deep therein, have I digested the general grounds of it? Have I mastered Gravesande, Keill, Sir Isaac Newton’s *Principia*, with his “Theory of Light and Colours”? . . . If I have not gone thus far, if I am such a novice still, what have I been about ever since I came from school?³

Such an admonition comes from a time when the leaders and teachers of the church were avidly keeping up with the latest scientific discovery, or making their own. Richard Holmes documents the so-called second scientific revolution of the late eighteenth and early nineteenth centuries in which the scientific method and the poetic imagination converged, albeit temporarily.⁴ Here was a time when scientists reveled in poetry and spirituality, and poets and pastors were enamored with the discoveries of science. Underappreciated by both the “new atheists” and today’s fundamentalists is the fact that many scientific discoveries of the past were made by persons of deep faith driven by the desire to know the secrets of nature and, in turn, the mind of God. Even Charles Darwin was seriously considering the ministry as he boarded the *H.M.S. Beagle* to begin the journey that would point him in another vocational direction. That age now seems irretrievably lost.

Today continuing education for church leaders is largely devoted to matters of congregational growth and conflict resolution, lectionary preaching and crisis counseling, youth ministry and educational theory, all for good reason. Conversely, one

would be hard pressed to find classes at theological institutions that offered evolutionary biology for pastors, cosmology for Christian educators, or paleontology for commissioned ruling elders. Quantum mechanics for seminarians? How absurd! And yet a lack of familiarity with these disciplines and their mindboggling discoveries, I submit, signals a heavy theological impoverishment and a refusal to engage the public sphere, which includes the culture of science.

Science and Scripture

To disregard what science has revealed about the intricate and dynamic order of the natural world is tantamount to tearing out the Bible's first pages. Compositionally, the Bible need not have begun with creation. It could have easily opened with the call of Abram or with wandering Jacob (cf. Deut. 26:5) or with the exodus story. But it didn't. It is a canonical fact that the biblical story begins cosmically. It is a scientific fact that our story, the story of humanity, begins cosmically. And just as it began, the Bible's unfolding drama ends cosmically. So also the saga of life predicted by science.

Is it a coincidence that creation serves as the Bible's bookends, while in between the psalmists, sages, and prophets inquire of the natural world in their testimonies of God's providence? "When I look at your heavens, the work of your fingers . . ." (Ps. 8:3; cf. 19:1); "I turned my mind to know and to search out and to seek wisdom and the sum of things . . ." (Eccl. 7:25); "It is the glory of God to conceal things, but the glory of kings is to search things out" (Prov. 25:2; cf. Jer. 31:37). The first sentence of the first chapter of Darwin's *On the Origin of Species* begins with the words, "When we look to . . ."⁵

Looking and searching, observing and studying — psalmists, sages, and scientists are the cohorts of wonder, the practitioners of "inquisitive awe."⁶ Together they validate the human desire to explore the world, "to search things out," to observe and study the world that God in wisdom has created (Prov. 3:19-20). "The self-revelation of creation," as Gerhard von Rad once described biblical wisdom,⁷ is an integral part of divine revelation. To construe biblical faith as anti-scientific is truly anti-biblical. If theology is truly "faith seeking understanding" (à la Anselm), and science is a form of understanding seeking further understanding, then theology has nothing to fear and everything to gain by engaging science.

The Journey of Science

What, then, does ministry gain from science? I do not mean the psychological and social sciences, important as they are to ministry. I mean the so-called hard sciences, from astronomy and physics to chemistry and biology. Here's my simple answer: some familiarity with the natural sciences, however limited, quickens our sense of wonder about God, the world, and the self.⁸ Indeed, the history of science is a journey of wonder and surprise, one filled with disorientations and new orientations (with apologies to Walter Brueggemann). Copernicus, Darwin, Einstein, Heisenberg, to name a few, have helped forge that journey.

Astronomy, for example, has shown the earth to be but a "pale blue dot"⁹ situated in a solar system located in the hinterlands of the Milky Way, an ordinary galaxy populated by over 200 billion stars set within a universe populated by at least 100 billion galaxies. As astrobiologist Chris Impey puts it, "The history of astronomy

has been a steady march of awe and ignominy”¹⁰—awe over the unimaginable size and age of the universe, ignominy in realizing that we are not the center of anything, cosmically speaking. Beginning with the Greek mathematician Aristarchus (310-230 BCE) and confirmed by the Polish astronomer Nicolaus Copernicus (1473–1543 CE), the sun was put into its rightful place as the center of a solar system, with Earth as the third rock from the sun among seven other planets. For our cultural (and theological) ego, this constituted the greatest of letdowns.

So if we are not the center of the universe, what is? Truth be told, there is no center. At the moment of the Big Bang, space as we know it came into being. “In the beginning, at the Big Bang singularity, everywhere and everything was in the same place.”¹¹ This statement by cosmologist Peter Coles counters the popular assumption that the universe had to begin at some point located in space from which everything exploded. But there was no point *in* space at the moment of the Bang. “Before” the Big Bang there was no space, just as there was no time. At the Bang, space itself inflated, stretched as it were like a balloon, and it continues to inflate as our universe continues to expand due to the accelerating force of dark energy. We live in a runaway universe in which the perspective of a center is an illusion.

Biology, too, has put us off center. As evolutionary biology has irrefutably demonstrated, our species came woefully late to the festival of life. Life began on Earth some 3.6 billion years ago with the formation of the simple cell (prokaryotes). Anatomically modern humans emerged only 250,000 years ago. If Earth’s history (c. 4.6 billion years) were compressed into a single hour, the first cells would have appeared just after 17 minutes, but the first humans would have emerged at the last one tenth of the last second of that hour. Or to choose another metaphor, if Earth’s timeline were like a roll of toilet paper—a standard roll consisting of 400 squares (preferably soft)—then life would have begun at the 120th square, dinosaurs at 380 (with their extinction at 394), and *Homo sapiens* at 1 mm from the end of the roll.¹² Or if you are a bibliophile, then in a 1000-page book, with each page representing 4.5 million years, the age of the dinosaurs would begin on page 728, and all of recorded human history would fit comfortably on the last line of the last page. We are an endnote, but apparently not the last endnote. The book continues to be written.

So what is our place biologically? We are one among 8.7 million species (latest estimate) that flourish, in varying degrees, on this still unexplored planet. The evolutionary biologist J.B.S. Haldane (1892-1964) was asked by a cleric what biology could say about God. He allegedly replied, “I’m really not sure, except that the Creator, if he exists, must have an inordinate fondness of beetles.”¹³ Indeed, beetles, with their some 400,000 species, make up close to 25% of all known animal species. In the grand scheme of things, we humans are latecomers and are quite young as a species. Most species have existed much longer than we have on this planet. We are evolutionary infants, which explains why our species has not yet become more genetically diverse.

Theological Disorientation

According to some, astronomy and biology have excelled in demoting the human species, and in one sense that’s entirely true. Neither spatially nor temporally does humanity constitute the center of creation. Historically, that has proved to be a rather disorienting perspective, defying “common sense.” But then science has

always excelled at being counterintuitive. Ask any quantum physicist. At the most fundamental level of reality, things that were once considered mechanically straightforward and atomistically discrete turn out to be fuzzy, indeterminate, and existing partially in different states at the same time. Who would have guessed? Who *could* have guessed?

What can we say about all this theologically? Two interrelated questions come to mind: First, what *was* God doing prior to the advent of humanity, during the past 13.7 billion years minus the near mere blip of 250,000 years that our species has been dominating the planet? What was God doing *ante hominem*? Second, what *is* God doing throughout the universe and at various scales of reality, from the quantum to the cosmic? Regardless of how you answer these questions, one thing is painfully clear: divine activity cannot be limited to the human realm. Otherwise, one would have to conclude that God was doing nothing during the 3.6 billion years of life on earth prior to the first appearance of *Homo sapiens*. Or that God's work has been limited only to our planet across the 13.7 billion light-years of the universe's expanse, not to mention the possibility of other universes. To put it bluntly, is God not concerned with the rest of creation? The "rest" of creation is no remnant or afterthought. To affirm otherwise would be the height of hubris. God, the creator of all, is cosmic. Christ, in whom all things were made, is cosmic (Col. 1:15-20). The Spirit, which hovered over "the face of the deep," is cosmic (Gen. 1:2). The cosmic is not limited to how long the human mind has been cogitating or how far the human hand (complete with an opposable thumb) can stretch.

Science effectively subverts the perennial temptation to treat creation as merely the stage for the unfolding drama of salvation (i.e., *human* salvation)—an all too common and lamentable case of theological reductionism. But that is no longer possible with science. If anything, creation read through the lens of science stretches the theological imagination, turning it into an exercise of wonder and wondering. So what has God been doing all these billions of years and all the billions of light-years across the universe? Or has God been merely waiting (or in the psalmist's words, "sleeping") all this time simply to write that "final" sentence of the Book of Creation (e.g., 44:23; 59:5)? If "Christ plays in ten thousand places," God's creativity unfolds in billions more.¹⁴

De-centering Humanity/Enlivening Humility

To profess that God has been active throughout all of creation is to de-center, radically and thoroughly, humanity's place in the cosmos. Humanity has no monopoly upon God's attention and intentions. God cares for it all, from the Big Bang to the whole Shebang. De-centering is precisely what Job experienced after having encountered the God of the Whirlwind. De-centering is what the psalmist experiences under a clear night sky (Ps. 8:3) or amid God's "manifold works" in creation (104:24). Stargazing, it seems, is always good for questioning human identity: "What are human beings. . . ?" (8:4). For all that we know about the universe today, so much more than the psalmist could have imagined, the question remains timeless. What are human beings on this mere speck in interstellar space? If the psalmist experienced a sense of "smallness" before the celestial vastness, today we sense our utter insignificance within the cosmic expanse of at least 100 billion galaxies.

Nevertheless, it is precisely through the de-centering experience that the psalm-

ist discovers humanity's true import, and it begins with God: "What are human beings that *you* are mindful of them, mortals that *you* care for them?" (8:4). Amid the cosmic expanse, the psalmist testifies to a sense of being regarded, acknowledged, attended to (Hebrew *pqd*), a sense of connection with the Creator, and it is precisely this connection that is foundational to everything that follows in the psalmist's praise of humanity's glory (vv. 5-8; cf. Gen 1:26-28). To put it spatially, the psalmist moves from a sense of smallness to largeness, from a felt insignificance before the vastness of the cosmos to a sense of greatness vis-à-vis earthly creation.¹⁵ How does that happen? For the psalmist, it happens theologically. It can also happen scientifically.

The astrophysicist Neil deGrasse Tyson speaks of the psychology of holding a "cosmic perspective." Yes, such a perspective entails a harrowing sense of one's own insignificance amid the vastness of it all. It is the kind of experience that Ursula Goodenough describes when viewing the night sky on a camping trip in Colorado after having taken a physics class in college:

Before I could look around for Orion and the Big Dipper, I was overwhelmed with terror. The panic became so acute that I had to roll over and bury my face in my pillow. . . . The night sky was ruined. . . . I wallowed in its poignant nihilism. A bleak emptiness overtook me whenever I thought what was really going on out in the cosmos or deep in the atom.¹⁶

Disorientation with a vengeance. But Goodenough found a way to "defeat the nihilism that lurks in the infinite and the infinitesimal," namely, a felt connection to "Mystery."

I lie on my back under the stars and the unseen galaxies, and I let their enormity wash over me. I assimilate the vastness of the distances, the impermanence, the *fact* of it all. I go all the way out and then I go all the way down, to the fact of photons without mass and gauge bosons that become massless at high temperatures. I take in the abstractions about forces and symmetries and they caress me, like Gregorian chants, the meaning of the words not mattering because the words are so haunting.¹⁷

The "caressing" side of the cosmos lies, according to Tyson, in recognizing our "genetic kinship" with all life on Earth, our "chemical kinship" with life elsewhere in the universe (a very high probability), and our "atomic kinship" with the universe itself.¹⁸ Science has shown how the human species is interlinked with the universe. On the atomic level, the four most common chemically active elements in the universe just happen also to be the most common elements of life on Earth: hydrogen, oxygen, carbon, and nitrogen. "We are not simply in the universe. The universe is in us."¹⁹

The Hubble Space Telescope has photographed galaxies over ten billion light-years away. Our galaxy, the Milky Way, is a mere 100,000 light years across. And ourselves? Measure your height in light years, and it turns out to be rather miniscule. But what if the universe were the size of the Milky Way, as was once thought by astronomers until Edwin Hubble began discovering galaxies or "island universes" in 1923. If the scale of the universe were only the size of our galaxy, not enough time would have elapsed for stars to form and generate elements heavier than hydrogen

and helium.²⁰ In fact, if the visible universe had an extent of only 100,000 light years, the universe would be a mere 100,000 years old, and we would not see anything but photons, electrons, and protons. (Of course, there would not be any “we” to observe this.) At that point in time, electrons and protons would not have been cool enough to recombine into neutral matter (i.e., atoms), which could happen only after 300,000 years.²¹ In other words, the massive size and age of the universe, including “the loneliness and darkness of space,” are necessary conditions for the universe to be generative, for us to exist.²²

Through the lens of science, we find ourselves more connected to creation than we could have ever imagined. We are connected to a creation that is incomprehensibly large, inconceivably old, and marvelously complex, a creation that at its most fundamental level is dynamic and at its most macrocosmic level is ever in motion. Things we once thought were stable and operated like clockwork turn out to be dramatically dynamic and remarkably fecund, with every bit of it interconnected, including time and space itself. As the universe is “fearfully and wonderfully made,” so also the human self (Ps. 139:14). That is the new orientation that both science offers us and the Bible bears witness to: I link, therefore I am.

A Pastoral Encounter

The new orientation afforded by science reminds me of a recent encounter with a retired pastor in Ohio who shared with me an epiphany he had while making a hospital visit. He was feeling so overwhelmed with pastoral demands and needless congregational conflict that he began to question his call to ministry. Walking down the hallway, he passed a room that stopped him in his tracks: from it he heard cries not of pain but of joy over the birth of a child. Pausing at the closed door, he started to weep. He realized in a very visceral way that God was at work far beyond his own purview. As God was active outside the circle of his own anguish, he felt connected, linked to this family, which he could not see, and to the Giver of life, whom he could not contain. A heavy weight was lifted from his shoulders. It was this moment, he confessed, that sustained him throughout the rest of his active ministry.

God in creation is at work beyond our reach, out of sight, in the dark as well as in the light. As much as God is beside us and around us, God is also present out there, way out there, billions of light years away. Likewise, God has been at work long before us, billions of years before us, igniting the Big Bang and luring life from polymerized molecules. But there is plenty to behold just right here. “How manifold are your works!” proclaims the psalmist. How marvelous is the natural world, proclaims the biologist. Faith *and* science call us to be consummate “beholders”—curious, inquisitive, compassionate beholders. Perhaps that is the true and ultimate aim of education. And as for theological education, becoming beholders of God’s wonders is the first step toward becoming “stewards of God’s mysteries” (1 Cor. 4:1).

Notes

1 Quoted in Richard Holmes, *The Age of Wonder: How The Romantic Generation Discovered the Beauty and Terror of Science* (New York: Vintage Books, 2008), 388.

2 In the words of Stanley Hauerwas, quoted in William Willimon, *Pastor: The Theology and Practice of Ordained Ministry* (Nashville: Abingdon, 2002), 60.

3 Quoted in Catherine Keller, *On the Mystery: Discerning Divinity in Process* (Minneapolis: Fortress, 2008), 51-52.

4 See note 1.

5 Charles Darwin, *On the Origin of Species by Means of Natural Selection*, in *From So Simple a Beginning: The Four Great Books of Charles Darwin*, ed. E. O. Wilson (New York: W. W. Norton, 2006), 453.

6 My shorthand definition of wonder. See William P. Brown, *Sacred Sense: Discovering the Wonder of God's Word and World* (Grand Rapids: Eerdmans, 2015), 1-14.

7 Gerhard von Rad, *Wisdom in Israel*, trans. James D. Martin (Nashville: Abingdon, 1988 [1972]), 144-76.

8 I explore this in depth in *The Seven Pillars of Creation: The Bible, Science, and the Ecology of Wonder* (New York: Oxford University Press, 2014).

9 Coined by Carl Sagan, who requested NASA to turn the cameras on Voyager 1 as it neared the edge of the solar system back toward Earth for one last photograph. On February 14, 1990, the photograph revealed Earth 3.7 billion miles as less than the size of a pixel. See <http://visibleearth.nasa.gov/view.php?id=52392>. More recently, and with similar effect, NASA's Cassini spacecraft took a picture of Earth under Saturn's rings nearly 900 million miles away on July 23, 2013. See <http://science.nasa.gov/media/medialibrary/2013/07/23/splash.jpg>.

10 Chris Impey, *The Living Cosmos: Our Search for Life in the Universe* (New York: Random House, 2007), vii.

11 Peter Coles, *Cosmology: A Very Short Introduction* (Oxford: Oxford University Press, 2001), 44.

12 Thanks to John Pilger, biology professor at Agnes Scott College, for this analogy.

13 Quoted in David Beerling, *The Emerald Planet: How Plants Changed Earth's History* (Oxford: Oxford University Press, 2007), vi.

14 Adapted from Richard A. Floyd, *Down to Earth: Christian Hope and Climate Change* (Eugene, OR: Cascade Books, 2015), 94, who cites from Gerard Manley Hopkins's poem, "As Kingfishers Catch Fire."

15 It should be noted that the dominion model is not the only model of human place and purpose in creation offered in the Psalms. In Psalm 104, human beings constitute one species among many living in peaceful coexistence (esp. vv. 19-23).

16 Ursula Goodenough, *The Sacred Depths of Nature* (Oxford: Oxford University Press, 1998), 9, 10.

17 Ibid., 12-13.

18 Neil deGrasse Tyson, *Space Chronicles: Facing the Ultimate Frontier*, ed. Avis Lang (New York: W. W. Norton, 2012), 258.

19 Ibid.

20 Holmes Rolston III, *Three Big Bangs: Matter-Energy, Life, Mind* (New York: Columbia University Press, 2010), 4.

21 Thanks to Chris De Pree, astrophysicist at Agnes Scott College, for explaining this.

22 John D. Barrow, *The Constants of Nature* (New York: Pantheon, 2002), 113.