

# Not just another animal

## Evolution and human distinctiveness

John Brubacher

*When I look at your heavens, the work of your fingers,  
the moon and the stars that you have established;  
what are human beings that you are mindful of them,  
mortals that you care for them?  
Yet you have made them a little lower than God,  
and crowned them with glory and honour.  
You have given them dominion over the works of your hands;  
you have put all things under their feet,  
all sheep and oxen,  
and also the beasts of the field,  
the birds of the air, and the fish of the sea,  
whatever passes along the paths of the seas. (Ps. 8:3–8 NRSV)*

### A thought experiment

I seem to have developed preoccupation with the concept of “heaps.” Imagine yourself sitting at a table, with a bag of fine-grained sand. You put one of the tiny grains of sand from your bag onto the table. Is there a heap of sand on the table? Obviously not. So, you add a second grain of sand to the first. This is still not a heap. You continue in this way, one grain at a time. At some point, you *will* have a heap of sand on the table, by any reasonable understanding of what a heap is. The question is, when—at what point, precisely—did the non-heap become a heap? Not sure? OK, try going in reverse. Start with your heap and take away grains of sand, again one at a time. When does the heap stop being a heap?

There is no exact point at which adding a grain turns a non-heap into a heap or removing a grain turns a heap into a non-heap; nevertheless, iterative addition or subtraction will turn one state of being into the other. Paradoxes like this one—known as *sorites* paradoxes, after the Greek word for heaps (*soros* is the singular form)—have been known since

the classical era.<sup>1</sup> For related fun, imagine adding hairs to the head of a bald man. At what point is he no longer bald? Or, in your favourite digital illustration software, make a gradient of colour that smoothly shades

**There is no exact point at which adding a grain turns a non-heap into a heap or removing a grain turns a heap into a non-heap; nevertheless, iterative addition or subtraction will turn one state of being into the other. Paradoxes like this are known as sorites paradoxes.**

from red to blue—where does the colour decisively shift from one to the other? Despite the blurry margins between the poles of such series, it would be absurd to argue that, because individual steps in the series have near-imperceptible effects, therefore heaps are not real things or red is really just blue.

Such classical formulations of the sorites paradox are low-stakes mental exercises. I confess that my opening sentence above was mostly tongue in cheek; I don't lose sleep worrying about heaps, and only very little if pondering my receding hairline. Serious discussions of the paradox note that "soritical" circumstances usually involve a vague predicate—

one that is difficult or impossible to define precisely—like bald, red, or heavy.<sup>2</sup> We are generally content to live with blurriness at the borders that distinguish between *adjectives* like tall and short or green and yellow. However, one of the reasons that soritical scenarios are seriously discussed today (and rightly so) is that they also apply to several *things* (nouns) of philosophical and practical significance. As a biologist, I am especially intrigued by its applicability to several fundamental biological processes: At what point in your life did you become an *adult*? When does a developing human embryo become a *person*?<sup>3</sup> In our evolutionary history, when did

1 Roy A. Sorensen, "Sorites arguments," in *A Companion to Metaphysics*, 2nd ed., edited by Jaegwon Kim, Ernest Sosa, and Gary S. Rosenkrantz (London: Wiley-Blackwell, 2009), 565–66.

2 Dominic Hyde and Diana Raffman, "Sorites Paradox," in *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, <https://plato.stanford.edu/archives/sum2018/entries/sorites-paradox/>.

3 Reasonable people might argue that this is a flawed example because personhood begins at conception—an embryo is *already* a person. Fair enough, but "conception" itself is a fuzzy term, which might justifiably be defined to begin with fertilization, karyogamy (the union of sperm and egg nuclei), activation of the embryonic genome, or implantation. These processes span days; see, for example, Peter Braude, Virginia Bolton, and

our ancestors become *human*? It is the latter question that I want to consider here, to examine the implications of evolutionary theory for what it means to be human.

I should clarify that I do not intend to litigate the veracity of evolutionary theory here. For what it's worth, I am a fully convinced evolutionist. Like the great evolutionary geneticist Theodosius Dobzhansky,

I cannot make sense of biology without evolutionary theory,<sup>4</sup> any more than a chemist can make it through the day without atomic theory. My question, rather, is this: If we accept the theory of evolution, what does that imply about humanity?

**At what point in your life did you become an *adult*? When does a developing human embryo become a *person*? In our evolutionary history, when did our ancestors become *human*?**

### **Evolution as a soritical series**

In *The Origin of Species*, Charles Darwin laid out his “long argument,”<sup>5</sup> that we and the living organisms around us today are modified descendants of those that came before—that ultimately we can

all trace our ancestry back to a population of one or a few forms of proto-organisms. The notion of evolution was not new with Darwin. The novelty he set out was a plausible mechanism that could account for both (a) change over time and (b) the exquisite adaptation of organisms to the ecological niches they occupy.<sup>6</sup> That mechanism, natural selection,<sup>7</sup> works

---

Stephen Moore, “Human gene expression first occurs between the four- and eight-cell stages of preimplantation development,” *Nature* 332 (31 March 1988): 459–61.

4 Theodosius Dobzhansky, “Nothing in biology makes sense except in the light of evolution,” *American Biology Teacher* 35, no. 3 (March 1973): 125–29.

5 Charles Darwin, *The Origin of Species*, 6th ed. (London: John Murray, 1876), 404; available at [http://darwin-online.org.uk/converted/pdf/1876\\_Origin\\_F401.pdf](http://darwin-online.org.uk/converted/pdf/1876_Origin_F401.pdf). Darwin’s characterization of the entire book as “one long argument” is found in all editions; see, e.g., p. 459 of the first edition.

6 A niche, in the ecological sense, refers not only to an organism’s physical surroundings but also to its way of making a living—the role that it plays in its biological community.

7 The principle of natural selection was also independently arrived at by Alfred Russel Wallace, “On the tendency of varieties to depart indefinitely from the original type,” *Zoological Journal of the Linnean Society* 3, no. 9 (20 Aug. 1858): 53–62.

on the following simple (but easily misunderstood or mischaracterized) logic:

1. Individuals in a population *vary* in their characteristics.
2. Those variable characteristics (at least some of them) are (at least somewhat) *heritable*: transmitted from parents to their progeny.
3. In a situation where resources are limited,<sup>8</sup> individuals whose characteristics are well suited to their context will be more likely to survive and *produce healthy offspring* than individuals who are less-well adapted.<sup>9</sup>

Over time therefore, well-adapted organisms will leave more progeny to posterity, and to the extent that their traits are heritable, those traits will appear in an increasing proportion of the population.<sup>10</sup> Natural selection would be expected to result in gradual change of a population of organisms *in a series of incremental steps* from generation to generation.<sup>11</sup>

---

8 Resources should be considered broadly to include not only raw materials for life but also suitable habitat or mates, for example.

9 This is the point that Darwin referred to as the “struggle for existence,” a metaphor that is often misunderstood too narrowly to imply a state of unrelenting aggressive conflict. Here is how he describes the generality of the “struggle” when introducing it in chapter 3 of *Origin*: “I should premise that I use this term in a large and metaphorical sense including dependence of one being on another, and including (which is more important) not only the life of the individual, but success in leaving progeny. Two canine animals, in a time of dearth, may be truly said to struggle with each other which shall get food and live. But a plant on the edge of a desert is said to struggle for life against the drought, *though more properly it should be said to be dependent on the moisture*” (italics mine).

10 As a slight aside to correct a common misconception, note that selection is by definition *non-random*. While the variations referred to in point 1 derive from genetic mutations that *are* random (at least in regard to their potential utility) reproductive output and survival of progeny are not simply arbitrary but are dictated at least in part by the conditions and rules of the surrounding ecosystem, including the basic physical laws woven into the fabric of creation. For a more nuanced scientific perspective on the potential for directionality emerging from the evolutionary process, see the papers collected in Simon Conway Morris, ed., *The Deep Structure of Biology: Is Convergence Sufficiently Ubiquitous to Give a Directional Signal?* (West Conshohocken, PA: Templeton, 2008).

11 When Darwin first published *Origin*, knowledge of heredity and organismal development was in its infancy. As our understanding of these phenomena has increased, so has our appreciation of the fact that some evolutionary changes can occur rapidly enough to be easily perceptible by us in real time. This more nuanced understanding does not, however, invalidate the principle that evolution generally proceeds gradually—“insensibly” (imperceptibly), as Darwin put it.

Thus, it seems to me that the evolution of a given lineage is a good example of a soritical series. Although the overall evolutionary tree of life forks and branches as lineages diverge from the root, one can trace an unbroken line from the tip of any one branch back to that root.<sup>12</sup> If you were to reconstruct such a path, you would see a transition from one type of thing to another, in which the difference in subsequent generations would be imperceptible, much as we saw a gradual transition from a non-heap to a heap in the thought experiment above. While a heap may be a poor analogy for a complex living organism, it is not a huge step of imagination to see how a process of agglomerating sand-grains that produces a heap might be extended in time and scope to produce, say, a temple. If we accept that humans share a common evolutionary history with the rest of the living world, then such reasoning can apply to the emergence of humanity.

### **Fear: Humanity as one animal among many?**

The nature and role of humanity is a core concern in Christian theology, as it is bound up with central doctrines of creation, sin, Christology, and salvation, to name just a few. There is a great deal at stake here for Christians, as has been clear from Darwin's day. In chapters 2 and 3 of his 1871 treatise on human evolution, *The Descent of Man and Selection in Relation to Sex*, Darwin discussed at length the relationship between the mental capacity of humans (arguably our most obviously distinctive feature) and other animals, which he summarized in part as follows:

*The difference in mind between man and the higher animals, great as it is, is certainly one of degree and not of kind. We have seen that the senses and intuitions, the various emotions and faculties, such as love, memory, attention, curiosity, imitation, reason, &c., of which man boasts, may be found in an incipient, or even sometimes in a well-developed condition, in the lower animals. They are also capable of some inherited improvement, as we see in the domestic dog compared with the wolf or jackal. If it be maintained that certain powers, such as self-conscious-*

---

<sup>12</sup> As with so many things in biology, this principle is not quite universally applicable. For example, many organisms have chimeric histories arising from the transfer of genetic material (DNA) between distantly related lineages, or the origin of novel branches via the fusion of previously distinct ones, when two separate species become so inextricably interdependent that they cease to exist as separate entities. Thus the tree of life has some weblike characteristics.

*ness, abstraction, &c., are peculiar to man, it may well be that these are the incidental results of other highly-advanced intellectual faculties; and these again are mainly the result of the continued use of a highly developed language.”*<sup>13</sup>

Such blurring of the distinction between humans and our non-human relatives is in tension with several core passages of Scripture that speak directly to human origins and role in the cosmos. In particular, Genesis 1:26–28 springs to mind, echoed in the passage from Psalm 8 above:

*Then God said, “Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth.” So God created humankind in his image, in the image of God he created them; male and female he created them. God blessed them, and God said to them, “Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth.”*

In the second account of creation in Genesis 2, we see additional markers of human distinctiveness in the man’s role as keeper of the garden (v. 15) and his appointment to name all the other animals, which were to serve as the man’s helpers (vv. 18–20).

These are clear—and I believe theologically non-negotiable—assertions of humans’ special status. Given that doctrinal starting point, it is understandable that Christians would be concerned about or even fearful of the notion that a gradualist evolutionary history for humanity frames us as different from other animals “only in degree, and not in kind.” Indeed,

---

13 Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, vol. 1. (London: Charles Murray, 1871), 105; available at [http://darwin-online.org.uk/converted/pdf/1871\\_Descent\\_F937.1.pdf](http://darwin-online.org.uk/converted/pdf/1871_Descent_F937.1.pdf). Modern readers should consider the context of this quote, both in the book and in the late-nineteenth-century setting. Darwin was making a case for the plausibility of human evolution from non-human ancestors, which required him to stress *continuity* along the evolutionary branch leading to humanity. At the same time, he also clearly felt compelled to stress human distinctiveness—a fine line to walk. Indeed, this passage follows paragraphs in which he emphasizes the *differences* between humans and a hypothetical ape that could describe its subjective existence to us. Nevertheless, the notion that differences between humans and other animals are “of degree and not of kind” seems a fair summary of Darwin’s view.

this is a common rationale for objecting to the theory itself among Christian anti-evolutionists.<sup>14</sup> Interestingly, while such arguments may dispute the veracity of human evolution, they fundamentally agree with Darwin about what it implies.

But do we really have to fear that common ancestry with other animals (or for that matter, amoebas, algae, and bacteria) robs us of the things that make us special—of the mysterious ways in which we embody and mirror God’s image? I think not.

**Do we really have to fear that common ancestry with other animals (or for that matter, amoebas, algae, and bacteria) robs us of the things that make us special—of the mysterious ways in which we embody and mirror God’s image? I think not.**

If human evolutionary history is an example of a soritical process as I’ve argued above, then drawing the conclusion that humans cannot be distinct from the rest of God’s creatures is not only unnecessary but also absurd. Indeed, University of Nottingham theologian Conor Cunningham has argued that it is *anti-evolutionary* to infer that humans are “merely animals” in the light of evolutionary theory, as doing so denies the capacity of the evolutionary process to produce genuinely novel traits.<sup>15</sup>

From a biblical standpoint, it seems that humanity’s distinct status comes

from our special creation by direct, creative acts of God. While a “natural” process *could* produce such a biologically distinctive life form as humanity, such scientific (naturalistic) accounts of our emergence leave us without the spiritual distinctiveness conferred by God’s hands-on activity. But who or what is a Christian to propose as the origin of natural processes (includ-

14 See, e.g., Roger Patterson, *Evolution Exposed: Biology* ([Petersburg, KY]: Answers in Genesis: 2007), chap. 10; <https://answersingenesis.org/human-evolution/ape-man/the-origin-of-humans/>; Jonathan Wells, *Icons of Evolution: Science or Myth? Why Much of What We Teach About Evolution Is Wrong* (Washington, DC: Regnery, 2002), chap. 11. I do not mean these citations to imply endorsement of these authors’ anti-evolutionary arguments, which I and most biologists find deeply flawed. See, e.g., Kevin Padian and Allen D. Gishlick. “The talented Mr. Wells,” *Quarterly Review of Biology* 77, no. 1 (March 2002): 33–37; [https://ncse.com/files/pub/creationism/Padian\\_Gishlick\\_QRB\\_2002.pdf](https://ncse.com/files/pub/creationism/Padian_Gishlick_QRB_2002.pdf).

15 Conor Cunningham, *Darwin’s Pious Idea: Why the Ultra-Darwinists and Creationists Both Get It Wrong* (Grand Rapids: Eerdmans, 2010), 3–5.

ing evolution) if not God?<sup>16</sup> Additionally, while we often stress the special creation of humanity in Genesis 1 and 2, I am also struck by the poetic phrases that highlight our earthy origins, and I think we would be wise to take that language seriously. For instance, Genesis 2:7 states, “Then the Lord God formed man from the dust of the ground, and breathed into his nostrils the breath of life; and the man became a living being.”<sup>17</sup> The mode of creation (minus the “breath of life”) parallels that used to produce other living things such as trees (“Out of the ground the Lord God made to grow every tree that is pleasant to the sight and good for food,” Gen. 2:9) and the other animals (“So out of the ground the Lord God formed every animal of the field and every bird of the air,” Gen. 2:19).

We are not gods or angels but creatures evolved from the “dust” of this planet—related but not identical to our evolutionary cousins.<sup>18</sup> This is not a cause for fear or denial but another call serve our divinely ordained role in humility and awe of the Creator.

### About the author

John Brubacher is assistant professor of biology at Canadian Mennonite University in Winnipeg, Manitoba.

---

16 I am keenly aware that significant issues of deism and theodicy arise when one too-simplistically identifies evolution as a mechanism of God’s creative activity, and I fear that I’m venturing into that territory here by pointing in that direction without providing additional nuance. That said, if evolution seems too wasteful, indirect, or hands-off to be used for creative purposes, consider that Frances Arnold, George Smith, and Sir Gregory Winter used just such a process of random mutation and (non-random) selection to generate the novel enzymes and antibodies for which they were awarded the 2018 Nobel Prize in chemistry. See Sara Snogerup Linse, “Scientific background on the Nobel Prize in chemistry 2018: Directed evolution of enzymes and binding proteins” (Stockholm, Sweden: Royal Swedish Academy of Sciences, 2018); <https://www.nobelprize.org/uploads/2018/10/advanced-chemistryprize-2018.pdf>.

17 As is often noted, this is a meaningful pun: the original Hebrew puns *adam* (the man) with *adamah* (dust of the ground).

18 The English “creature” derives from the Latin *creatura*: a created thing.