Uniquely Human: Who Are We?

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Author's Note

This paper is a revised version of the paper read to members of the Chicago Literary Club at its regular meeting held at the Cliff Dwellers on Monday evening, January 28, 2019. In addition to minor revisions to the text of the paper that was read to the Club, this revised version includes citations to sources of direct quotations and other material in the paper as well as information, explanations, comments, etc., that are more appropriately suited to placement in endnotes than in the body of the paper.

Preface

“What (a) piece of work is a man . . . .”

—*Hamlet (2.2.327)*

The title of this paper is “Uniquely Human: Who Are We?” Asking how we humans are unique among all other species—living and extinct—had seemed to me to be a straightforward question. It didn’t take long, however, for me to realize that a true consideration of this question encompasses not only the long history of humankind but, seemingly, almost the whole of human learning. I also became aware that if I were to continue to pursue this inquiry, I would put myself at risk “of going down a rabbit hole,” meaning, that is,

> to enter into a situation or begin a process or journey that is particularly strange, problematic, difficult, complex, or chaotic, especially one that becomes increasingly so as it develops or unfolds. *

Heedless of the risk involved, and to what effect I remain uncertain, I have read such ambitious books as Jared Diamond’s *Guns, Germs, and Steel*; Yuval Harari’s *Sapiens: A Brief History of Humankind*; Jonathan Haidt’s *The Righteous Mind;* Frans De Waal’s *Are We Smart Enough to Know How Smart Animals Are?;* Andrea Wulf’s *The Invention of Nature: Alexander von Humboldt’s New World;* and relevant parts of Harold Bloom’s *Shakespeare: The Invention of the Human;* as well as the essays of Lewis Thomas in his books *The Lives of a Cell* and *The Medusa and the Snail*. I have also left my fingerprints all over the internet.

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* *Farlex Dictionary of Idioms,* https://idioms.thefreedictionary.com/go+down+the+rabbit+hole, (accessed March 30, 2018).

In so doing, I found that the ground on which this inquiry rests is not only treacherous but is also perpetually shifting. Much of what has been written on this subject is incomprehensible (at least to me), and much of what survives as comprehensible is subject to qualification, doubt, debate, refutation, retraction, ridicule, and sometimes outright vilification. To the fullest extent possible, I have attempted to anchor what I have to say this evening to textual sources that are reasonably coherent and also appear to be authoritative. In all other cases, I have simply been guided by my own ignorance.

Finally, there were times when I thought I should give up on this paper, and perhaps you will conclude from this evening's reading that that is exactly what I did.

Uniquely Human: Who Are We?

We start with a few words about taxonomy—the scientific system by which living things are described and classified and that includes all plants, animals, and microorganisms. This system was first laid out by the eighteenth-century Swedish botanist, Carl Linnaeus, who is often referred to as the father of taxonomy. A deeply religious man, Linnaeus merely described and classified the species that had been deposited on Earth on the sixth day of Creation. His system is in wide use today but has seen many changes over time. For those who are interested, an outdoor sculpture of Linnaeus may be seen at the Chicago Botanic Gardens.

Linnaeus named our own species *Homo sapiens,* and we have been so classified to this day. The word Homo means "man" or "human being," and the word sapiens means "wise." Plenty of evidence exists to suggest that the choice of the word *sapiens* to identify our species is wildly inaccurate, but, right or wrong, we humans got to do the classifying and naming, and the matter is settled, at least for now. On the taxonomic ladder, a species is the basic unit of classification. Species that are closely related are also grouped together in another taxonomic category, known as a genus. In our own case, our genus name is *Homo.*

According to fossil records, *Homo habilis* is believed by some paleoanthropologists to be the first member of the genus *Homo* and therefore the first "human" species. That would have been about two million years ago. Others followed as new discoveries were made. One is *Homo erectus,* thought by some to be the direct ancestor of *sapiens.* Another is *Homo neanderthalensis,* our closest extinct human relative, who disappeared about 40,000 years ago but some of whose DNA survives in modern humans. A third is *Homo naledi,* the most recently discovered member of our genus, estimated to have lived 300,000 to 200,000 years ago. In fact, there are thought to

have been at least a dozen other human species whose members, at one time or another, starting about two million years ago, were running around, through field and forest, celebrating their evolutionary status. Unfortunately, or otherwise, all of them are now extinct, and are quaintly referred to in taxonomic jargon as "archaic humans." We *sapiens,* the "best and the brightest," are the sole surviving members of the genus *Homo.*

Although our nearest relatives are now long deceased, when it comes to asking what makes our species distinctive, there are plenty of other life forms to be examined. Scientists, in fact, in 2011, estimated that the planet was then home to 8.7 million species. The breakdown was roughly as follows: 7.8 million species were classified as animals, 298,000 as plants, 611,000 as mushrooms, mold, and other fungi, 36,400 as protozoa, and 27,500 as algae. This did not include the number of species of bacteria, for which there seemed to be no reliable estimate. Some authorities put the number in the trillions.

Attempting to distinguish ourselves from all of these other species is beyond the scope of this paper. Beyond that, it strikes me as silly for our purposes here to undertake to compare and contrast ourselves, for example, to a mushroom. Common sense is required: after all, as Hamlet said to Guildenstern, "I know a hawk from a handsaw." By narrowing our focus, we can gain substantial traction in pursuing our inquiry. Human beings, in addition to being classified as such by taxonomists, are also classified as primates, a group estimated to consist of about 300 living species. We can further narrow our focus by limiting this inquiry to a small, select group of primates. This group includes not only us sapiens but also those primates we most closely resemble—namely, chimpanzees, gorillas, and orangutans. The four of us are known taxonomically as the Great Apes.

This inquiry is not solely a scientific one. Philosophy and religion also play a part. Indeed, the traditional position of philosophers and theologians is that man is unique among all other animals. The Greek philosophers were among the earliest to stake out that position. Not surprisingly, Aristotle claimed that reason was humanity's defining characteristic, but also asserted that reason was something that we were innately meant to achieve, a concept later rejected by the early modern philosophers starting with Francis Bacon, who was followed by René Descartes, Thomas Hobbes, David Hume, John Locke, and others. Descartes, incidentally, was deeply engaged with the question of what makes us human and suspected that someday there might be a need for a test to determine whether something is human or is a machine. That he was interested in machine intelligence came to me as a surprise, but I later learned that he is being mentioned increasingly in articles about artificial intelligence. It also occurred to me that his famous declaration—"Cogito, ergo sum": I think, therefore I am—might have something to do with our subject, but insofar as I could discern after hours of fruitless research, it does not (or at least, I don't think it does), so I turned to an examination of religion's contribution to this inquiry.

In this regard, I hope you will not be disappointed this evening to hear that an examination of the world's seven or eight principal religions is beyond the scope of this paper. I intend my brief comments here to be confined to Judeo-Christian beliefs. This makes the task easier, since the story, at least the part of the story pertinent to this inquiry, is pretty much laid out in the first book of the Old Testament. The story begins about 6,000 years ago, when "the earth was a formless void" and the six days of creation took place. (Genesis 1.1-31) Of significance here is that man was created on the same day as the animals, suggesting, perhaps, man's kinship with animals, but describing man himself as being created "in the image of God" and therefore

something very different from a non-human animal. The biblical text does not explain what this "image" is, but many tend to think of man as having been created to look like God. (Who would not so think who has seen Michelangelo's *Creation of Adam* on the ceiling of the Sistine Chapel?) While this interpretation is too literal for most people, the word certainly may be taken to suggest that man is special in God's creation and that man is in some way like God himself.

In the second account of creation contained in the book of Genesis (2.4-25), the text says that God formed man from the dust of the ground and "breathed into his nostrils the breath of life," suggesting a spiritual essence that survives death and returns to God, and that distinguishes man from all other living things. Soul and spirit are the two words in play here, and there seems to be disagreement among theologians not only as to what they are but also whether or not they are the same or are two different things. I followed this debate through the theological thicket until I got hopelessly lost and finally gave up. Let us safely conclude, however, that the traditional Christian position is that humankind harbors a divine something that makes him, and her, supremely different from all other creatures.

There is a fierce battle going on between those who believe that man was created by God as told in the book of Genesis and those who contend that he evolved over time as a result of a process known as natural selection, the theory for which Charles Darwin is famous. This battle is being fought in court houses, legislative assemblies, polling booths, school boards, on the internet and in other media outlets as well as in bars, karate parlors, locker rooms, and other intellectual outposts throughout the country. It should also be noted that another group, one more or less allied with Christian traditionalists, has entered the battle under the banner of intelligent design, conceding that man evolved over time from more primitive life forms but only as a result of the guidance of a higher power, not by natural selection. The argument made by those who

espouse intelligent design is that humans, in all their manifest glory, are far too complex to have evolved willy-nilly from the lower orders, and that only a guiding hand could account for such a phenomenon. For legal reasons, God is usually not mentioned by members of the intelligent design movement, but it is not clear to what "higher power" they would otherwise be referring.

There is yet another group whose voice should be acknowledged. The members of this group are not scientists or philosophers, nor are they theologians. They are merely everyday citizens who find it insulting, even repugnant, and sometimes frightening or threatening, to be identified as a Great Ape. This is understandable. All of us—all of us, if not winners ourselves—like to be associated with winners, and that means, in this case, being a member of the planet's all-time, number-one life form. Liken the expression of this very human feeling, if you will, to 100,000 students packed in a university football stadium, insanely bellowing, "We're Number One! We're Number One!" and while we're at it, imagine, also, some of their parents perhaps watching the game on television and wondering why they had mortgaged their homes in order to send their children to college in the first place. This phenomenon—to enlarge ourselves by distancing ourselves from others—is also sometimes evident in day-to-day discourse when members of our species refer disparagingly to others of our kind as dogs, pigs, rats, skunks, weasels, toads, vipers, baboons, and, as our president might say, other shithouse species, sometimes even using animal body parts, like a horse's ass, or worse.

With this helpful background, we are closer to addressing the question, what makes us uniquely human? But we are not quite there yet—not until we've taken a closer look at the theory on which the life sciences are based, the theory of evolution.

Philosophers and theologians had this subject pretty much to themselves until Charles Darwin appeared on the scene with the publication in 1859 of his book *On The Origin of Species by*

Means of Natural Selection. His theory of evolution describes the process by which minute changes occur in all living organisms over long periods of time, resulting in the development of increasingly more complex life forms. It explains how these changes occur as a result of random gene mutations and how they tend to enable an organism to better adapt to its environment and thereby increase its chances of surviving and passing on to its offspring adaptive traits that will help to insure their own survival. Darwin's theory also envisions that all living organisms are related and have descended from a common ancestor. Based on the fossil record, this last universal common ancestor has been estimated to have lived 3.5 to 3.8 billion (or more) years ago. However this universal common ancestor itself came to exist (a subject beyond the scope of this paper), it obviously adapted successfully to the environment in which it found itself, and thus began the eons-long evolutionary process that resulted in the eventual emergence of *Homo sapiens.*

Human beings, at least for now, have clearly won the evolutionary race. After nearly four billion years, we are the dominant species on planet Earth. The question is, how did we do that? Is there one characteristic or trait that separates us from all other species and enabled us to achieve that dominance? In answering that question, we need to seek out our closest relatives in what taxonomists call the evolutionary tree. As we know, our closest such relatives would once have been those now classified as archaic humans, such as Neanderthal man, but they have long been extinct, and while they have left a fossil record and some scattered signs of their culture that can be studied, our focus will be on our closest *living* relatives—that is, chimpanzees, gorillas, and orangutans, with whom we share up to 98 to 99 percent of our DNA.

If we found ourselves at a zoo looking at members of one or more of these three species, certain differences between them and us would readily be apparent. For example, their bodies

would be completely covered with hair, they would not be wearing clothes or footwear, none of them would be wearing glasses, they could work their feet pretty much like their hands, have sloping shoulders, and they would seem to enjoy scratching themselves a lot. Recently, I could confidently have added to this list that they would not be smoking. But this is no longer true. About a year ago, an irate animal activist filmed a video at a zoo in Indonesia of a chimpanzee taking some drags from a lit cigarette in its enclosure. A visitor to the zoo had flicked his half-smoked cigarette into the enclosure, and the chimp picked it up and puffed on it a couple of times and then stubbed it out in a manner that displayed a remarkable degree of sophistication. Confirming the truth of the time-worn adage "Monkey see, monkey do," this episode shows that our simian relatives appear to have an innate ability for mimicking human behavior. To be fair, however, it must also be acknowledged that humans have demonstrated a remarkable ability to mimic the behavior of apes.

There are clearly more consequential characteristics that distinguish *Homo sapiens* from our ape brethren, and ape sistren, too, and I will get to those characteristics shortly. First, however, I'd like to comment on a human trait that I had not heretofore considered as being a part of this survey—that human trait being blushing. Wikipedia defines blushing as "the reddening of a person's face due to psychological reasons. It is normally involuntary and triggered by emotional stress . . . , such as that associated with embarrassment, anger, or romantic stimulation." Darwin himself referred to it as "the most peculiar and most human of all expressions." No other mammal blushes: we alone possess the "blushing" gene. How and when it entered our gene vocabulary and the purpose that it serves are interesting questions, but like almost everything else this evening, the pursuit of these questions is beyond the scope of this paper. Also beyond

the scope of this paper is the verification of the observation by some scholars that Jane Austin's heroines are prone to blushing a lot.

If there is a blushing gene, why not a laughing gene? Unlike blushing, laughing is a trait that we share with other animals, and that may even have evolved prior to the emergence of humans. Laughter-like sounds, for example, have been detected in chimpanzees, gorillas, and orangutans. They have also been detected in rats. Indeed, Wikipedia tells us that "Rats that laugh the most also play the most and prefer to spend more time with other laughing rats." How human-like is that?

Rats aside, I am convinced that laughter is among the most prized attributes of our species. It is indeed a gift from the gods. Not only is laughter the "best medicine" in a true medical sense, laughter is also an effective means of conveying emotions such as joy, happiness, and relief. There are also such other types of laughter as nervous laughter, the courtesy (or obligatory) laugh, mocking laughter, and even sinister laughter. Finally, laughter may be seen—at least according to Friedrich Nietzsche—as a legitimate coping mechanism for those who are by temperament inclined to regard their own existence as an absurdity and the great globe itself as a cosmic joke. Imagine, in this regard, how Job, outgunned by God at every turn—imagine how much better off Job might have been had he responded to the hopelessness of his situation with laughter, albeit of the nervous kind.

Smiling, incidentally, is a sister trait. Like laughing, it can express and communicate a wide range of emotions, including pleasure, sociability, acceptance, happiness, joy, and amusement, and is an important means of non-verbal communication among humans. Since it takes about forty-two muscles to smile, the evolutionary development of the smile would seem to be truly remarkable, and one must wonder at what stage of its development the smile became useful as an

adaptive trait. As with laughter, we share the smiling gene with other animals. One primatologist, in fact, has traced the smile back over 30 million years of evolution to the so-called "fear grin" displayed by monkeys and apes.

While laughter and smiling are subjects we could enjoyably spend more time on, they are not traits that are unique to humans but are shared with other animals, and even if traits such as blushing are distinctive to us, they could not alone account for our standing on top of the evolutionary pile.

There are many human traits and abilities that were once commonly believed to be unique in the animal kingdom, but we are finding that more and more of them are shared with other species. Among them, to name a few, are the following: cooperation, self-awareness, empathy, tool use, opposable thumbs, and bipedal locomotion. The last two—opposable thumbs and bipedal locomotion—are often mentioned as significant factors in our success. Though they may certainly be contributory factors, we must acknowledge that opossums also have opposable thumbs and that chickens, like humans, likewise walk on two legs, but that neither opossums nor chickens have been able to launch a rocket into outer space—at least not yet. Maybe a distinction here can be found in the words of the eminent linguist disguised as a baseball player, Yogi Berra, who, in another context, is reported to have said, "Our similarities are different."

Frans de Waal, the Dutch/American primatologist and author of the book *Are We Smart Enough to Know How Smart Animals Are?* has been especially active in this field. Whenever de Waal concludes a lecture on the many similarities between us and our Great Ape brethren (and other species as well), he says that the following question inevitably hangs over the audience: "But what then does it mean to be human?"

When you read what has been written on this subject, you will find that the amount of hypothetical discourse and theorizing is staggering. Be that as it may, the consensus seems to be that it is language that is the marker of humanity—as the dividing line between man and animals—so much so that an eighteenth-century bishop was prepared to baptize an ape provided that the ape could speak. One of the most direct statements we have on the subject comes from the physician, poet, and essayist, Lewis Thomas, in his book *The Lives of a Cell.*

> It begins to look [he says] . . . as if the gift of language is the single human trait that marks us all genetically, setting us apart from all the rest of life. Language is . . . the universal and biologically specific activity of human beings. . . . We cannot be human without it.

Frans de Waal himself, although stressing unique and sterling communication abilities and skills in other species, also emphasizes the singularity of human language. "I consider us," he says, "the only linguistic species. We honestly have no evidence for symbolic communication, equally rich and multifunctional as ours, outside our species."

What is key about this revelation is a full understanding of the advantages that this unique gift bestows upon our species and thereby widens, by many orders of magnitude, the differences between *Homo sapiens* and all other species, past and present. In a narrow sense, quoting de Waal again, "the first and foremost advantage of language is to transmit information that transcends the here and now." "There is great survival value," he adds, "in communication about things that are absent or events that have happened or are about to happen." But more, much more, than having physical survival value, language has enabled us to tell stories, to write and to read books, to reason abstractly and think introspectively, to mine the past for its lessons and speculate about the future for its possibilities, to establish systems of governance, to conduct

scientific experiments and develop complex technologies, to develop, store, and transfer great amounts of information, and to express our thoughts and emotions through literature, art, and music—and, yes, throughout recent modern human history, let us acknowledge it, to declare and prosecute wars against one another that cause widespread ruin and destruction and result in the massive loss of life and unimaginable suffering (a subject, perhaps, for another time).

Both Jared Diamond and Yuval Harari stress the unique role played by language in the historic advancement of *Homo sapiens.* In his book *Guns, Germs, and Steel*, Diamond states that human history "took off around 50,000 years ago," a development that he refers to as the Great Leap Forward and that he attributes to "the perfection of the voice box and hence for the anatomical basis of modern language, on which the exercise of human creativity is so dependent." In similar fashion, Harari, in his book *Sapiens: A Brief History of Humankind*, refers to the "appearance of new ways of thinking and communicating, between 70,000 and 30,000 years ago," that constituted what he refers to as the Cognitive Revolution and that he attributes to accidental genetic mutations in the wiring of our species' brains that enabled us to think in new ways and communicate in a "new type of language." Asking what the secret of humankind's success was, Harari, while acknowledging that "the debate continues to rage," concludes as follows: "The most likely answer is the very thing that makes the debate possible: *Homo sapiens* conquered the world thanks above all to its unique language."

Identifying language as the marker of humanity and the presumed secret of our success is one thing, accounting for its origin and existence in our species is another. For some time, it was believed that language was simply a matter of learned behavior, and while much about language and how we use it is learned, others argue that language has a genetic basis and was thus innate to the species and that the first words spoken were therefore the product of random evolutionary

developments subject to the rules of natural selection. This argument further splinters into a debate as to whether the language gene resides in the human voice box or in the human brain or whether one or more genes work in concert with another or others to account for the origin and existence of language. Other debates revolve around questions as to when the first words were spoken and as to whether the capacity for human language developed in a single location and thereafter spread to other locations or whether it developed spontaneously in widely separated locations at roughly the same time. And if *sapiens* were indeed hardwired for language, why was the wiring so different among members of the species that hundreds of languages blossomed? In truth, the consideration of these questions is freighted with so much disagreement and uncertainty in the scientific community that I have found that I am able to write confidently about them without serious exposure to risk of error or contradiction.

One of the consequences of such disagreement and uncertainty is that the door is left wide open for a theological explanation of the origin of language. In the matter at hand, the biblical account is that Adam—and Eve, too—were created by God already possessing the divine gift of articulate speech: for Adam, to name the animals in the Garden, and, for Eve, to engage in conversation with a serpent, which, interestingly, also possessed the gift of speech. The riddle of the multiplicity of languages was also solved when God put a halt to the building of the Tower of Babel by confusing the language of the builders and scattering them across the face of earth, separating them not only by place but also by language.

Whether your position on the questions at hand is grounded in science or in religion, man's exalted status among all living creatures has long been celebrated in word and song. Few examples, however, compare with the words of the psalmist in Psalm 8 from Book I of Psalms, in a hymn addressed entirely to God, expressing a sense of man's wonder combined

with praise and thanksgiving—reading, in part, as follows:

> What is man, that thou art mindful of him? . . . .
>
> For thou hast made him a little lower than the angels, and hast crowned him with glory and honour.

Where does all of this leave us? I'm glad you asked. I had been reluctant to conclude this paper without asking myself one more question, one that has been dealt with by scientists and theologians alike and that seemed to beg for attention—that question being, does humankind possess an "evil" gene? Unfortunately, when I embarked on this side trip, I did not realize that the word evil has had such a fraught history; that it's meaning has become increasingly unsettled; and that few persons any longer care to confront the so-called "problem of evil," with which the word was most likely first associated. And I soon regretted having asked myself the question.

The concept of evil encompasses not only the problem of evil—that is, the problem of reconciling the many imperfections of this world with the goodness of God—but also such knotty subjects as free will, the doctrine of original sin, and the evolution of moral behavior. If any of you are able to speak with authority on these subjects, you are probably overqualified for membership in this Club and should not be here this evening. In any event, I decided to leave my thoughts on this subject unspoken tonight and to bury them instead in a seven-page footnoted footnote, to reside there, like a Russian nesting doll, as a paper within a paper.

Having thus disposed of any thought of addressing the evil-gene question this evening, I found myself without a conclusion for this paper. It seemed fitting, however, to acknowledge that we gather here on these Monday evenings not only as members of the Chicago Literary Club, but

also as members of that ultra-exclusive species known as *sapiens*—known and celebrated as evolution's darlings, the unfolded and still unfolding flower of civilization, the alpha dogs, the quintessential beings, of all Earth's creatures, living and extinct. Who can say it better than Shakespeare, in the words of his most famous and perhaps most enigmatic character.

> What (a) piece of work is a man,/ how noble in
> reason,/ how infinite in faculties,/ in form and mov-
> ing how express and admirable;/ in action how like
> an angel,/ in apprehension how like a god:/ the
> beauty of the world, the paragon of animals . . . .

In an evolutionary sense, it took us 3.5 billion years (or more) for us to get here. Fortunately, our ancestors bore the rigors of this journey, having survived, among other things, five biological mass extinctions, the last of which occurred about 65 million years ago, and somewhere along the way we acquired the distinguishing feature of our species—the gift of human speech.

When the first word was spoken, and what it was, we will never know. The shortest road to insanity is to inquire into the origin and evolution of speech, mostly because spoken words don't fossilize. The first languages likely consisted of interjections and nouns, which were probably uttered with different intonations to convey different meanings, and would possibly also have been accompanied by such instructive gestures as, for example, a blow to the head. At most, the earliest languages probably consisted of no more than three hundred words. Sentences, if there were such, would have been limited to one or two words. It seems clear, however, that once we started talking, we never learned to keep our mouths shut. History records that nobody was ever sent to the gallows for being a good listener, but that hundreds of thousands have lost their heads for exercising their constitutional right of free speech, proving, among other things, that not all

speech is free. The most recent example is that of the well-known journalist and critic of the Saudi government (Jamal Khashoggi) who walked into the Saudi consulate in Istanbul several months ago and has neither been seen nor heard from since.

According to sources, the King James Bible contains 8,000 words. Shakespeare had a vocabulary of 30,000 words (although some estimates put the number as low as 16,000). Samuel Johnson's dictionary contained 43,000 words; *Webster's Third New International Dictionary* includes 470,000 entries; and my own compact disc version of *The Oxford English Dictionary (Second Edition)* defines "over half a million words." Some authorities even put the number of English words at more than one million.

What does all of this mean? For those of us who are members of the Chicago Literary Club, who are engaged, according to our By-laws, in the pursuit of "literary culture," it means that as we go about preparing and presenting our Monday-night papers, we will never be at a loss for words. Founded in 1874, the Club is now in its 145th season. How many papers have been written and presented and how many words have been consumed in the process are unknown. We do know, however, that clubs like ours were formed in the late 1800s in Boston, New York, Philadelphia, Cincinnati, Indianapolis, and other cities, large and small, throughout the country, and that, with only two known exceptions, we are the oldest surviving club of its kind still meeting on a regular basis with our original program format intact—all in all, a very Darwinian achievement.

Notes

1. As best we know, Neanderthals inhabited the planet for nearly 400,000 years, *sapiens* for about 200,000 (and still counting). For many years following their fossil discovery and subsequent classification, Neanderthals were objects of derision, not only in the popular mind but also among scientists. "Savages," "brutes," and "ogres" were common expressions. Having been displaced by *sapiens*, the word losers was also thought to be appropriate. That picture is changing. In an article entitled "Us and Them" by Jon Mooallem appearing in the January 15, 2017, issue of *The New York Times Magazine,* 40, the author says, "Neanderthals are people, too." He continues: "They were actually 'very similar' to their contemporary Homo sapiens in Africa . . . . Neanderthals buried their dead. They made jewelry and specialized tools . . . Their tracheal anatomy suggests that they were capable of language . . . ." and so on. Ibid., 44. An article in the Science Times section of *The New York Times,* February 27, 2018, is headlined "The Neanderthal, the Artist" and states that "Recent studies of cave art suggest that the cousins of modern humans were more sophisticated than their beastly reputation." We know also that they interbred with *sapiens* before they disappeared, accounting for the fact that from 1 to 2 percent of Neanderthal DNA is found in Eurasian populations of modern humans. These findings have led to a much-debated series of challenging questions, each indicative of the complexity and far-reaching tentacles of the subject of this paper. Some of these questions are as follows: How did humans and Neanderthals relate to one another in areas where they co-existed. What led to the extinction of the Neanderthals? (And where cave art is concerned, the inevitable question is, what is art?) A question also exists as to whether Neanderthals are correctly classified as a separate species in the genus *Homo* (as opposed to a subspecies of *sapiens).*

2. Suzanne Goldenberg, "Planet Earth is home to 8.7 million species, scientists estimate," *The Guardian,* https//www.theguardian.com/environment/2011aug/23/species-earth-estimate-scientists, (accessed December 29, 2018). As indicated in the text of this paper, the estimate did not include the number of species of bacteria.

3. Viruses were also excluded from the estimate, in large part, presumably, because there is a question as to whether viruses are life forms. There is a raging debate among scientists regarding this question, which may be sampled on the internet. The debate hinges on how the term life is defined, a subject also of interest to philosophers, theologians, and abortion opponents. Apart from this debate, there is an interesting front-page article on viruses by Jim Robbins, entitled "At Home, Even in the Sky," in the Science Times section of the April 17, 2018, issue of *The New York Times.* Referring to a stream of viruses that scientists have discovered circling the globe, the author reports that these scientists have calculated that each day "some 800 million viruses cascade onto every square meter of the planet," making them "the most abundant entities on the planet by far."

4. *The Oxford Dictionary of Philosophy* (Oxford University Press, 1996) states that Descartes (1596-1650) is "the founding father of modern philosophy" (at page 100). The online version of the *Encyclopedia Britannica* offers the following: "Descartes's influence on Western philosophy is so pervasive that all Western philosophers, even those who reject Cartesianism, can be said to be Cartesians . . . ." and, further, that "his conception of rationality informed modern Western ideas of what it means to be a human being until nearly the end of the 20th century." (https://www.britannica.com/topic/Cartesianism) An online perusal shows Descartes's name surfacing in various articles on the subject of evolution, but the commentary in such articles is so dense that any attempt on my part at a coherent presentation on the nature of the discussion would be a "bridge too far."

5. LUCA, a.k.a. the Last Universal Common Ancestor, is our ancestral mother. She was a single-cell, bacterium-like organism. All organisms (i.e., life forms) now living on the planet are her descendants. Her family consists of three branches, which taxonomists call domains (a domain being the highest taxonomic rank). All organisms are now scientifically separated into these three domains. They are known as Bacteria, Archaea, and Eukaryota. Bacteria and Archaea are single-celled microorganisms that do not contain a nucleus. Eukaryota, on the other hand, consist of many single-cell organisms as well as *all* multi-celled organisms. In addition, organisms in this domain have a membrane-bound nucleus in their cell or cells. *Sapiens* are members of the domain Eukaryota. We share that domain with plants, fungi, something called protists, and all other animals. Each of these four groupings is known taxonomically as a kingdom.

Many of us find it surprising that we are crowded into the same domain with plants, fungi, and protists. We can accept, I believe, although perhaps grudgingly, that we are related to chimpanzees, gorillas, and orangutans. But plants? Fungi? Protists?

Plants are multi-cellular, photosynthetic organisms. They make their own food by using energy from the sun. About 400,000 species are currently known to exist. Fungi were once grouped taxonomically with plants, but are now regarded as being more closely related to animals. Unlike plants, fungi are unable to make their own food, but instead draw their sustenance from decomposing organic matter. Some species of fungi produce mold, which can be nasty stuff, but fungi also produce edible mushrooms and truffles. The animal kingdom is the most diverse of the four Eukaryota kingdoms, largely due to a huge insect population. Like fungi, animals are unable to make their own food, and survive by eating plants, fungi, and each other. (The information in this paragraph, as well as information about protists for those who may be interested, may be found at https://basicbiology.net/biology-101/tree-of-life , [last edited April 6, 2018].)

Many people find unseemly, even outrageous, the suggestion that we are distantly related to plants, fungi, and protists (not to mention bacteria), while others rejoice at the prospect of universal harmony seen by them as implicit in such a kinship. (E.g., the words of the prophet, Isaiah 11: 6-9, visually interpreted by Edward Hicks in his series of *Peaceable Kingdom* paintings.) There is also research underway suggesting that some members of these other kingdoms share surprising traits and characteristics with us *sapiens.* Trees are an example. In an article by Richard Grant, headlined "Can Trees Really Talk to Each Other?" in the March 2018 issue of *Smithsonian* magazine,48-57, the author states that "A revolution has been taking place in the scientific understanding of trees . . . . The latest scientific studies, conducted at well-respected universities in Germany and around the world, confirm what . . . has long been suspected from close observation . . . : Trees are far more alert, social, and sophisticated—and even more intelligent—than we thought," 50. He explains that a substantial body of scientific evidence "shows that trees of the same species are communal, and will often form alliances with trees of other species" and that such trees "have evolved to live in cooperative, interdependent relationships, maintained by communication and a collective intelligence similar to an insect colony. . . . with the real action taking place underground" (through fungal networks by which trees in a forest are connected), 52. Is this science? Or is it poetry—a chorus of trees happily communicating as they go about cooperating with and aiding and protecting one another? Or does it matter? (See the article "Verse in the universe: The scientific power of poetry" by Niall Firth in *New Scientist* magazine, https://www.newscientist.com/ article/2073697-verse-in-the-universe-the-scientific-power-of-poetry/, [posted January 20, 2016].)

For those wishing to go further down this rabbit hole, go online with any combination of the search words "evolution," "pantheism" and "Spinoza."

6. “Chimpanzee Seen Smoking a Cigarette, Angering Animal Activists,” *Inside Edition*, **Error! Hyperlink reference not valid.**, (posted March 7, 2018).

7. “Blushing,” *Wikipedia,* https://en.wikipedia.org/wiki/Blushing, (accessed April 10, 2018).

8. Ibid.

9. See, for example, Crozier, W. Ray, “The Blush: Literary and Psychological Perspectives, https://onlinelibrary.wiley.com/doi/pdf/10.1111/jtsb.12105.

10. “Laughter in animals,” *Wikipedia,* https://en.wikipedia.org/wiki/Laughter-in-animals, (accessed April 12, 2018).

11. “Laughter,” *Wikipedia,* https://en.wikipedia.org/wike/Laughter, (accessed April 10, 2018).

12. “Smile,” *Wikipedia,* https://en.wikipedia.org/wiki/Smile, (accessed April 12, 2018).

13. Frans de Waal, *Are We Smart Enough to Know How Smart Animals Are?* (New York: W.W. Norton & Company, 2016), 125.

14. Lewis Thomas, *The Lives of a Cell: Notes of a Biology Watcher* (New York: Bantam Books, 1974), 105.

15. de Waal, 106.

16. Ibid., 107.

17. Jared Diamond, *Guns, Germs, and Steel; The Fates of Human Societies* (New York: W.W. Norton & Company, 1999), 39.

18. Ibid., 40

19. Yuval Noah Harari, *Sapiens: A Brief History of Humankind* (New York: HarperCollins, 2015), 21.

20. Ibid., 19.

21. Psalms 8:4-5 (King James Version).

22. The stakes are high here. In the September 2018 issue of *Scientific American*, devoted to the “science of being human,” there is an article entitled “Why We Fight,” 76-81. The question addressed in the article is whether humans have an innate predisposition to collectively organize to kill members of other groups — an “evil” gene if there ever was one. The author of the article answers that question in the negative, suggesting that “collective killing resulted from cultural conditions that arose within the past 12,000 years,” 78. Other authorities disagree with that conclusion.

23. This understates the nature of the case. At bottom, the subject is a semantic nightmare. Countless words have been spilled over the subject, mostly in vain. For those who wish to punish yourselves by tackling the subject firsthand, I recommend starting with the following: “What Do We Mean by ‘Evil’?” by Rollo Romig in *The New Yorker* for July 25, 2012, and “The Concept of Evil” in the *Stanford Encyclopedia of Philosophy* (first published November 26, 2013). In addition, The Great Courses program offers a series of thirty-six lectures entitled “Why Evil Exists,” purporting to cover nearly 5,000 years of human history on the subject, (advertised in *The New York Times*, International section, August 8, 2018). It may also be helpful at the outset to know that the word evil has typically been used with reference to (a) a malevolent supernatural force, traditionally the devil in Christian theology, (b) natural

evils, like floods, hurricanes and earthquakes (usually regarded as “evils’ in terms of the harm or suffering caused), and (c) so-called human evils.

24. This footnote is reserved for the inclusion in a possible future iteration of this paper of the author’s remarks on the subject of evil. It is also possible that such remarks may instead be revised and expanded for presentation to the Club as a separate paper.

25. William Shakespeare, *Hamlet,* The Folger Shakespeare edition, ed. Barbara A. Mowat and Paul Werstine (New York: Washington Square Press, 1992), 2.2.327-31.

26. The reliability of these numbers, estimates or otherwise, is problematic. An entertaining discussion of the subject may be found in a book by Bill Bryson, *The Mother Tongue: English & How It Got That Way* (New York: William Morrow and Company, 1990), chap. 10, “Order Out of Chaos,” 147-60.

27. The two known exceptions are the Chit Chat Club (in San Francisco) and the Cincinnati Literary Club.