CHAPTER TWO

EVOLUTION: THE BEST IDEA EVER

The most extraordinary fact about public awareness of evolution is not that 50 percent don’t believe it but that nearly 100 percent haven’t connected it to anything of importance in their lives.

—David Sloan Wilson, Evolution for Everyone

THE PHILOSOPHER DANIEL DENNETT writes, “If I were to give an award for the single best idea anyone has ever had, I’d give it to Darwin, ahead of Newton and Einstein and everyone else.”1 Dennett is right, and perhaps more so than he even knows. I would argue that the idea of evolution is the key to liberating our spirit not just from outdated worldviews but ultimately from the constraints of our biology as well. The key word in answer to all the questions confronting humanity is evolution—nothing has stood still and nothing ever will. The meaning of life and our existence cannot be properly contemplated without the concept of evolution, especially if evolution is understood on a scale that is as large as we can stretch to embrace.

In order for us to rationally consider the evolutionary frontier at which we stand, it is essential for us to find a narrative, a goal, a purpose that is greater than merely our own happiness. In fact, in order to shed any light on the meaning of the self and of our humanity, our point of reference must be outside of it. Assuming a broad evolutionary cosmic perspective offers us this possibility. Hence, our emphasis is not just on human history, but on the link between the history of humanity and that of the history of the
universe; not just on human relationships, but on the link between the human condition and the cosmic future. Only from this greater perspective can we break free of our instinctive recoil and cultural taboos and consider our posthuman future from an informed yet open-minded position.

The emerging notion of “Big History,” the increasingly detailed picture of cosmic evolution, is becoming clear and unshakable in our time. This new picture of the universe is, I believe, free of supernatural elements and arbitrary divine interventions, yet I also believe with Albert Einstein that it nonetheless reveals a transcendent purpose. What Einstein saw as a “God who reveals himself in the orderly harmony of what exists” is also true from the Darwinian perspective. Mind you: this revelation does not necessarily justify a belief in a personal God. Rather, it warrants what Einstein called “admiration”—an “unbounded admiration for the structure of the world so far as our science can reveal it.” For me, this same wondrous structure is revealed in the track record of the evolution of life over the past billions of years and the forward momentum it is generating. Evolution is never a straight-line arrow, but from this new vantage point, an expansion of our concept of human spirit makes sense because it fits right into the ever-expanding flow of Cosmic Creation.

Confronting the Deeper Implications of Evolutionary Theory

The biologist Ernst Mayr hailed the 1859 publication of On the Origin of Species as “perhaps the greatest intellectual revolution experienced by mankind.” One hundred and fifty years later, we still have not fully recognized the significance of the evolution theory developed independently by Darwin and Alfred Wallace, despite the ongoing philosophical, theological, and scientific research on its wider implications. The significance of Darwin’s idea of evolution is not the mechanism of natural selection per se, which Darwin himself summarized as “multiply, vary, let the strongest live and the weakest die”; this concept is just one important piece of a complex picture even within the subject of biological evolution (sexual selection is another). In other words, the Darwinian concept of evolution is not limited to biology or the variation-selection-replication mechanism. What is so startling is
the larger nature of the process that his idea of evolution entails, especially in light of the modern cosmological understanding of how deep and dynamic the universe is. That is why the concept of evolution is so dangerous to some of our instincts and ages-old cultural dogmas.

What startled Darwin’s European contemporaries was neither the idea of species change nor the possibility of humanity’s humble origin, but rather the vision of a seemingly purposeless process without a guiding hand toward preordained perfection. Without doubt, Darwin challenged some of the most basic beliefs in his society and perhaps today’s as well. But the real issue between Darwinists and creationists as I see it is whether the human species is part of a grand process or a deliberate one-off design—and whether novelty has continued to emerge freely and spontaneously in cosmic history. The crucial question now becomes: If novelty endlessly arises in the course of time, how can one be sure that humanity is the pinnacle of the entire cosmic evolutionary process?

The evolutionary answer is: the human is no perfect being, and there could be better things ahead! Compared with the 13.7-billion-year-old universe that contains at least billions of galaxies, our existence is of absolutely negligible magnitude, both physically and temporally. Humanity has yet to comprehend this implication and shift its attention from an inward-looking fatalist being to an outward-looking, willful, autonomous becoming.

Since at least the time of Aristotle and Confucius, we have struggled to define what life is. Currently, the best abstract description of life may be the unifying principle of “supple adaptiveness”—the unending process of producing novel solutions to unanticipated changes in the problems of surviving, reproducing, and flourishing.

But a more comprehensive answer to the question “What is life?” requires attention to multiple levels of meaning. The basic definition scientists give is that life is a carbon-based structure that features self-replication, metabolism, and information processing. This is probably the lowest common denominator for all existing life on Earth. If we rise to a higher level of analysis and ask what life is capable of, one can say that it is capable of giving birth to complex living organisms with a central nervous system called the brain. And further, given the evolution of more and more com-
plex brains, life is capable of allowing consciousness to emerge. Further, when asked what consciousness as such is capable of, I would say it can consciously design new forms of intelligence that will embrace the cosmos and then fundamentally alter it. In other words, life and mind are capable of self-transcendence.

Looked at from this perspective, the human being is neither the final product of the universe nor merely an accidental happening on a little planet. It is exactly these deep implications of Darwin’s ideas that are still misunderstood, ignored, or rejected today. Almost all academic and popular books and discussions about natural and cultural history, including those that promote an evolutionary understanding of history, have narrowed themselves to the explicit or implicit purpose of teaching us about how to make human lives better.

There are multiple reasons why the cosmic implications of evolution are hard to grasp. Understanding evolution itself is difficult, and following through on its implications, especially for humanity itself, runs against some of our strongest intuitions and emotions. For instance, we feel bad, and very rightly so, about our historical wrongs—war, genocide, slavery, torture—and yet they have been part of the evolutionary process. Of course, we should prevent those inhumane activities, and we have largely succeeded in modern society. These efforts and successes in preventing them are also part of the evolutionary process. Nevertheless, the process of elimination goes on as evolution dictates; only the unit of selection has changed. Today we move forward by changing or eliminating failed governments, useless institutions, bankrupted businesses, and obsolete products.

The Darwinian concept of “master force” (creation and selection) is often emotionally hard to swallow—and that is partly why creationism is experiencing a revival today, not only in the U.S. but also around the world. Yet we now possess overwhelming tangible evidence of such a principle from many different fields in the form of the “modern synthesis” of the twentieth century, which integrated new knowledge from embryology and molecular biology with traditional elements such as paleontology. Still, understanding natural evolution remains an intellectually demanding task, partly because it can never be shown or proven in the same manner as, for example, proving that the Earth is round with a simple satellite picture. Indeed, skeptics of evolution point to the
fact that no mutations have ever been observed that have converted an animal to a markedly different one, for example, a fly to a wasp. Louis Agassiz, the eminent nineteenth-century zoologist, discoverer of the ice ages, and one of the “founding fathers” of the modern American scientific tradition, expressed typical grounds for disbelief upon hearing Darwin’s natural selection theory: It is impossible that God would have created the magnificent living world by random variation from “grubby ponds and woodlots”!

Social, economic, and cultural evolution are equally difficult to understand. Witness the general ignorance (until recently) of the role of technological and organizational innovation as a crucial factor driving the evolution of civilization. Innovations were once considered dangerous accidents (comparable to earthquakes or hurricanes) to their models of static equilibrium and harmony. In comparison, Lamarck’s theory of the inheritance of acquired characteristics has much more appeal to common sense, as it fits our lifetime observations of cultural transformation.

Such difficulties are part of the reason evolution remains controversial today, and we can only imagine the courage and perseverance needed by Darwin and his supporters at the time when the theory was way ahead of the natural sciences from which it sought support. Darwin himself had to apologize for the lack of support from the fossil record, and he later admitted the possibility of defeat after William Thompson (Lord Kelvin) published calculations concluding that the probable age of the solar system was only around 25 million years (based on several erroneous assumptions). Others concluded—again erroneously, based on a misunderstanding of the nature of hereditary material, or DNA—that new traits emerging from random mutations would be diluted very fast in the population. These faulty conclusions at first looked persuasive, and they seemed threatening to evolutionary theory because they reduced the necessary time span for natural selection to an impossibly short period.

But still, the idea of evolution by natural selection was never completely discredited in the early years of Darwinism. Ideological developments in nineteenth-century Europe—especially the advent of laissez-faire economics, British utilitarian philosophy, and the ethics of rugged individualism—provided helpful preparation. In biology, Georges Cuvier pioneered anatomical research that proved crucial. By classifying all animals on Earth accord-
ing to four fundamental internal body structures, he stimulated a revolution in morphology and taxonomy; soon, primitive societies were discovered in overseas explorations, and the striking physical similarities between humans and the great apes were first noticed. Biologists in the German idealist tradition argued that embryonic developments recapitulate the history of life on Earth, evolving toward a divine final goal. By the end of the century, the idea that species are not immutable was becoming thick in the air, although the origin of species was still generally thought to be a result of supernatural divine intervention or the catastrophic shakeup of the early environment.

In addition to learning from their intellectual forebears, Darwin and Wallace were aided by the contemporary advances in comparative anatomy and by their ability—unlike earlier thinkers in Europe—to easily travel the world to gather firsthand observations and access the latest paleontological finds. Darwin also learned from animal breeders the power of artificial selection. The most important insight for both men was probably their discovery of the wide geographical distribution of species and the competitive patterns they noticed in South America. As Marx wrote to Engels in 1862, “It is remarkable how Darwin rediscovers among beasts and plants the society of England, with its division of labor, competition, opening up of new markets, inventions, and the Malthusian struggle for existence.”

What makes evolution such an elegant and powerful idea is that it explains how organized complexity can arise spontaneously from primeval simplicity. But the most significant implication of the theory is not the well-known proposition that “man came from apes,” although one of Darwin’s major insights is the common ancestry of all biological organisms. We must instead recognize something far broader: that evolution is how the world functions and creates. Evolution is in fact a profound cosmic process, not just a theory of how biological species were originated and evolved; for evolution is the secret of how the structures of our brain are determined, how our immune system functions, how animals learn, how our habits and beliefs form, how languages and computer codes advance, how social organizations and institutions unfold, how cultures and civilizations develop, and how the universe operates in general. Some scientists have even speculated that evolution explains how the structure of the universe
itself was generated, perhaps by “cosmological natural selection” with natural variation coming from the quantum process. In this connection it is deeply satisfying to see how what Gary Cziko called “Universal Selection Theory” explains so much of what used to require supernatural explanations or resort to miracles. In the final analysis, it is evident that few areas—perhaps none—of human thought have been unaffected by the theory of evolution.

Moreover, the principle of evolution offers a new context for answering the deepest questions we can raise. Why are we here? Why has life continued to survive and thrive after billions of years? Why is there good and evil? Why is happiness so elusive? Why do we have to die? Why do we live in a vast, mostly empty and cold universe that is seemingly devoid of life except on Earth? Every one of us has at least touched upon such questions.

We now know that such inquiries and deep concerns cannot be fully addressed without referring to the evolutionary history of the universe. Furthermore, evolutionary history can show us things we seldom look for: Modern science and evolutionary theory help us to see, as far as we can, the world as an interconnected whole and as an endless drama unfolding. They help us to find our place in the whole process. Evolutionary theory does not answer the “ultimate” question of why the universe exists—nothing within the universe can—but it is the best explanation we have to answer the question of how highly organized and complex structures like human beings can arise through spontaneous, random actions at much lower, simpler levels. Evolution is a nonmiraculous process that has never ceased functioning in universal history, and there is no reason to expect it to come to a grinding halt in the future. Taken apart and examined in detail, evolution seems to be a chaotic mess; put together, the entire process makes sense and reveals a directional grand pattern in spite of its random nature.

Conscious Evolution: The Newest Wave in an Evolving Cosmos

If we think of evolution as one great tide moving forward, there is always a leading edge, breaking faster and faster into novelty, even as the rest of the wave moves through territory already covered. For much of cosmic history, that leading edge was the slow unfurling of matter. With the emergence of life, evolution’s frontier...
shifted into a new domain and began to gain momentum. And once life developed to the point of producing human beings, with their capacity for self-reflection and the creation of culture, the edge of evolution once again found a whole new domain of expression. With the advent of comparatively lightning-fast cultural evolution, natural evolution on Earth lost touch with this emergent frontier of cosmic evolution. Although DNA-based natural species continue to come and go, their situation has long become largely irrelevant to the movement of human civilizations.

Over the last five thousand years of cultural evolution, there have been major changes in humanity’s notions of its place in the cosmos. Now cultural evolution is also fast serving out its role on the evolutionary frontier. We humans will soon cease to be on the frontier. The mathematician Vernor Vinge declared in 1993 at the NASA Vision-21 Symposium, “Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended.”21 His timing could be off, as the pace of innovation is unpredictable, but not the direction. Although human activities will continue to generate new art, science, and real-life social dramas that are fascinating to humans, the cosmic evolutionary frontier will belong to our posthuman descendants—those with superhuman intelligence.

Natural history comes in waves, and so does human history. According to an ancient Chinese saying, each new wave in the Yangzi River moves with a fresh and powerful force, superseding the previous one (长江后浪推前浪). But the very success of the newest “wave” in realizing its potential ultimately renders itself out-of-date and even reactionary. Today we are at the end of the great secularizing movement that started with the Renaissance in the fourteenth century. That movement placed humanity at the center of the universe and demanded maximum freedom for the individual. The European Renaissance led to an explosion of human creativity in the arts, sciences, and technologies, first in the West and now around the world. But by throwing away the baby along with the bathwater, mainstream secular humanism self-limited its scope of activity to the mere notion of human cultural and economic improvement in pursuit of its self-declared goal of maximizing human well-being and happiness.22 This humanistic enlightenment can lift itself to a higher level by retrieving ancient
wisdom and redefining the meaning of human freedom, or else risk being left behind by the newest wave.

The posthuman future is not about us per se, but it is up to us to make it happen. Humanity as an end in itself is hopeless, yet all hope for the future resides in humanity. Again, this is best expressed in Chinese: we must “see deeply,” but not “see through” humanity and fall into nihilism (看透, 而不是看穿人生).

The conscious mind is our most important tool in this work. For while it is largely a slave to the instinctual pursuit of personal happiness, it is not a helpless puppet; it can also develop a detached perspective on our emotions and motivations. For example, it understands the purpose of establishing abstract rules and institutions to restrain inappropriate impulses. It is through this same capacity of self-discipline that we can confidently claim that we, as self-conscious intelligent beings, are not merely passive participants in the pursuit of personal freedom and happiness, but active directors in the drama of cosmic evolution. Humanity’s conscious efforts to transform itself in this way can be called conscious evolution, and conscious evolution is the new wave beyond natural and cultural evolution.

Evolution’s trajectory clearly shows us that the posthuman wave is a logical next step in the cosmic unfolding. But what will it take to get humanity to accept this new understanding of place and purpose? I believe a spiritual renewal is needed, one that calls for a new “cosmic faith” and a fundamental and potentially heroic elevation of human aspiration. The ultimate meaning of our lives rests not in our personal happiness but in our contribution to cosmic evolution—a process that transcends the human and yet is integral to who and what we are in the universe.

Our images of the world and of ourselves have always guided our actions. In pre-evolutionary thinking, we envisioned a predetermined “Great Chain of Being” with single-celled organisms at the bottom, animals a little higher, humanity somewhere in the middle, the angels another level higher, and God at the top. This static view of the world has now been replaced by an evolutionary view of the universe—a universe that started simple, became more diversified and complex over time, and eventually gave rise to humanity and its civilizations. The old static vision is mistaken, but it may still serve the purpose of symbolizing a world above
humanity, a “heavenly” world that has yet to be realized. It is in this sense that the evolutionary worldview need not end with humanity. The universe we live in is complex enough to give rise to human consciousness. And now it is up to our consciousness to decide whether the universe’s potential for organized complexity (the “design space,” as Daniel Dennett calls it) has been exhausted with the creation of humanity.

There is a time for everything. Today, the time is right, both socially and technologically, for a conceptual revolution and spiritual renewal. We can see a striking parallel between today and Darwin’s time as I just described—rapid technological innovations and scientific discoveries on multiple fronts, exposing the colossal inadequacies of a slow-moving human mentality and worldview. The outward windows to the past (geology and archaeology) and the non-European world (geography) were opened in Darwin’s time; the inward windows to the human body (genetics) and human mind (neuroscience, evolutionary psychology) are opening to us today. Now, as then, there is a relatively stimulating environment, with a free flow of ideas and integration of the global culture and economy.

The divide articulated by Fukuyama, Jeremy Rifkin, and other anti-posthumanists is not real from a higher perspective. The debate is not “for” or “against” the human. We all cherish and appreciate human existence. The question is about how to value that existence.

In the grand scheme of things, humanity’s value is in what it can do that other species cannot. The hero’s value is in what he or she can do that others cannot. Let us listen to Nietzsche’s voice again: “The time has come for man to set himself a goal. The time has come for man to plant the seed of his highest hope.”

Let us cast our eyes beyond what nature has done, to the posthuman era that seems both possible and improbable. Cosmic sentient beings with greater intelligence and wisdom than humans are certainly possible, since they would not contradict any known natural laws. They are improbable because only one species on Earth has evolved the ability to create them. This is humanity’s true place in the universe!
Not Any God, but a Cosmic God

“The world must have a God; but our concept of God must be extended as the dimensions of our world are extended,” wrote Pierre Teilhard de Chardin, a priest and paleontologist who became one of the great evolutionary philosophers of the early twentieth century. The anthropomorphic God can no longer withstand the scrutiny of the bright light of science and reason; but that does not mean we live in a Godless universe. In fact, what I call the “Creator God” actually comes into sharper focus under the light of science and reason, and gives humanity far more dignity and responsibility than our forebears ever imagined.

When we talk about God, we may be invoking many different conceptions. As we shall discuss in greater detail in later chapters, it is critical to differentiate between the anthropomorphic God (a personal God that thinks and acts like a human) and the cosmic God (a God that is responsible for the fundamental nature of the universe). The cosmic God as I will describe it is deeply satisfying in that it still retains (in a far more sophisticated form) characteristics of God with which we are familiar—law-giver, life-creator, and wisdom-giver. Even the reputed diehard atheist Richard Dawkins emphasizes in *The God Delusion* that he is only going after the anthropomorphic God.

The unfolding of cosmic evolution, especially the evolution of life and mind, can be explained by intelligible persistent patterns, or natural laws, without reference to arbitrary change of natural laws or inelegant “intelligent design.” Although we are far from being able to explain everything yet, all historical evidence suggests that we are a product of this ongoing, impersonal, but coherent cosmic process. Biological science tells us that if there is any biological species that has been designed, then that designer cannot be said to be very “intelligent” even by human engineering standards. The intelligent-design defense of a human-centric God denies the ultimate God that is cosmic in scale and infinite in creative potential.

Contrary to popular belief, science in no way contradicts the idea of a greater cosmic God. In the tree of life on Earth, we are just a single, albeit vitally important, twig newly emerged on the top. Yet just as we can discern the general direction of a tree’s upward growth toward the sun, our efforts to expand upward
could make a difference far beyond our roots on Earth. This general trend—what Alfred Wallace called “successive appearance of higher and more complex forms of life”\textsuperscript{24}—is the strongest hint as to where we should put our efforts and find the deepest meaning of our existence. We are masters of the universe, not in the sense that the universe was put in place and designed for us, but in the sense that, going forward, we can determine our own destiny and that of the universe. Under the natural laws, we have all the freedom we need. The ultimate freedom does not belong to the guts or emotions but to the higher consciousness, which can understand why we have certain instincts and feelings and act according to what it sees as right.

We tend to feel that we drive social and historical developments, but more often than not, it is unexpected technological breakthroughs and unintended consequences of certain innovations and organizations that initiate and invigorate the evolutionary process. The emergence of new sentient beings will follow the same surprising but thrilling dynamics.

Collectively, moving our highest concern from human happiness to cosmic transcendence is very difficult, but not impossible, for two reasons. First, we are not forcing ourselves to give up our human goals, since the pursuit of happiness is the most realistic way to realize the higher goal. Second, deep down we really do have what it takes to open a drastically new era in cosmic evolution.

The psychologist and philosopher William James suggested that the deepest human need is to be appreciated. The philosopher and educator John Dewey said the deepest urge in human nature is “the desire to be important.” According to Abraham Maslow, the highest human need is self-actualization—to gain a sense of freedom, confidence, independence, and most important, the enrichment of fulfilling potential. The call for freedom has been a dominant theme in recent history, particularly in the twentieth century. Yet, in a profound sense, we are still unfree. After gaining economic, political, and religious freedom, we still cannot control one crucial aspect of our lives: Every one of us was born into a fixed genetic endowment that is not of our choosing, not even of our parents’ choosing. In addition, we are each born unequal, with different (and often profoundly limited) physical, intellectual, and moral capabilities. And we are all subject to the limits of the “human condition” in general, including the inevitability of death.
Freedom from a fixed human nature that is conditioned by a particular historical path and is far from perfect will be the greatest and final freedom for humanity.

To summarize, humanity is not the ultimate creation of God (or the glorious pinnacle of evolution), nor is it just an accident (“the naked ape” or “the third chimpanzee”). Humanity is indeed special and unique. We can even say we are “chosen”; but we must ask why humanity was chosen and what it was chosen for. Humanity has to create to earn that “center of the universe” status and recognition, and we should never accept the human being as it is in a universe that is in eternal flux.

The freedom from human genetic bondage is in our hands. This is our frontier. Let us step forward with joy, courage, and responsibility.