Leaving Earth

Trajectory and Projections

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Life leaves or dies trying. This is one of the principles I consider essential to the processes of evolution. All life is invasive. It's never satisfied with the way things are. It's always on the move, striving to become something more. When our Universe began 13.7 billion years ago it was smaller than the tiniest of seeds, yet somehow burst beyond its confines and has been expanding ever since. It's still pushing its own limits and boundaries. Ours is a transcendent universe.

This is true, not only of what has become its incomprehensible expanse, but of everything about it and within it. When it began, the Universe had only one element, hydrogen. Eventually these lone elements formed immense communities of hydrogen clouds, becoming so heavy they collapsed inward. Their internal temperatures became hot enough from the pressure to form the first generation of stars, fusing two hydrogen particles together in the process, creating a second element, helium. When the pressure within these stars became too intense, they, like the Universe itself, began expanding, either by casting out their outer layers or becoming supernovae, making the entire Universe something more than it had been before.

This same process has been continuing for eons, our transcendent Universe forever expanding and becoming increasingly complex, becoming more than it's ever been before. It wasn't long after its own birth the Universe became complex enough to form the first planets. But these were gaseous planets composed mostly of hydrogen and helium balled together by gravity. We know it wasn't until after harder elements, like iron, magnesium, and silicon were formed, that it became complex enough to form rocky planets, including our Goldilocks planet, 4.5 billion years ago. A billion years later the Earth's transcendent chemistry became complex enough to form life. These most ancient of our ancestors, the prokaryotes, were single-celled microorganisms so simple they didn't even contain a nucleus. Yet, they weren't content to live as such simpletons. After another billion years had passed, they evolved into eukaryotic cells, complex enough to contain small organelles, including a DNA containing nucleus and mitochondria.

Yet they still weren't satisfied. Our eukaryotic ancestors could not contain themselves. Another billion years after our *simple* unicellular ancestors transcended into *complex* unicellular beings, they converged to form the first multicellular organisms—boneless, brainless globs of eukaryotic algae. Living in such close proximity, naturally communicating genetic materials, proving fatal in some cases and beneficial in others, which, through this process of natural selection, evolved into sexual reproduction. After about 600 million more

years, this first sexual revolution led to the emergence of simple animals like sponges, fungi, and coral. Though sturdier, more complex, capable of sexual reproduction, locomotion, and digestion, these first true animals on Earth still weren't content to remain where they were or what they were.

Their continued discontentment with staying put caused the Cambrian Explosion, during which life began diversifying faster than ever. Some organisms even dared venture from the life-sustaining oceans onto the hot, barren land. Many died in the process of getting trapped in the unbearably hot shallows and corrosive atmosphere. But some, presumably with just the right mutations, learned to survive the heat, and later to consume sunlight, rather than digesting other organisms. They became the first plants. Some plants later found their way into the seas, while some ocean creatures followed the original plants onto shore.

From this perspective, what Darwin named *evolution* can also be considered an ongoing process of transcendence, of everything in the Universe, including it's elemental, chemical, and biological structures, continuing to move beyond where they are and what they are. We live in a transcendent Universe and everything in it moves toward transcendent states.

Part of *transcendence*, a word that literally means, "climbing over," or, "surmount," includes transcending location. Life likes to get around or dies trying. All species are invasive species. Plants move about by letting the winds or other creatures carry their pollen and seeds to new places, sometimes adapting along the way. Other animals move about on their own, by land, air, or sea, also adapting themselves for new environments along the way via natural selection. Among mammals, the human animal has been the most successful at this. We've migrated and adapted to living almost everywhere, from the hot and humid savannahs to the frozen arctic tundra, from lush green forests and jungles to barren deserts, and have dipped ourselves deep into oceans and blasted ourselves far into outer space. We've accomplished all of this, transcending our natural environments, despite the limitations our natural bodies have enduring extreme heat, frigid cold, watery environments, and what should be certain death anywhere outside the Earth's atmosphere.

But we haven't only been great at transcending our natural environments. Human beings have another exceptional power, unlike that of any other animal we know of, the ability to liberate information from the unforgiving confines of our genes. Certainly, other animals are capable of learning new behaviors, some of which others of their kind might mimic. But most nonhuman animals, as far as we know, are born with all the knowledge they need to survive from almost the moment they are born. They have genetic knowhow expressed through instinct. Human beings, on the other hand, must learn the behaviors necessary to navigate and survive our ever-changing environments and cultures by being educated for many years after we're born. As our civilizations advance, each generation must learn new skills and knowledge than previous generations had to.

In this way, humans represent a major bifurcation point in evolutionary history. Through our species, information has begun to transcend the limitations of biology. Through us, information can now be exchanged inorganically, simply by exchanging nonphysical constructs known as ideas. Each Sunday as you hear a sermon, or when you read the paper or a book, or talk with a friend on the phone or over a cup of tea or coffee, a near miracle on Earth occurs. Inorganic nonphysical information is exchanged between two organisms through memes, not genes. I know some people complain my sermons aren't very spiritual, but I consider this idea my most spiritual belief of all, and, perhaps, among the most spiritual I've ever heard. It's what makes our species, despite its many downfalls, beautiful and special. We represent a transition of life from purely physical to nonphysical states. Maybe this is why so many of our religions imagine life beyond the physical, because these mythologies reflect some natural longing of life itself to transcend its physical constraints, its need to invade new dimensions of existence.

Pierre Teilhard de Chardin, the beloved Jesuit priest, mystic, and scientist who fully embraced evolution (a rare combination) envisioned this eventually resulting in information taking on a life of its own, until our planet itself becomes, in his terms, the "thinking Earth."[1] He goes on to explain, "we must enlarge our approach to encompass the formation, taking place right before our eyes… of a particular biological entity such as has never before existed on earth—the growth, outside and above the biosphere, of an added planetary layer, and envelope of thinking substance, to which, for the sake of convenience and symmetry, I have given the name of the Noosphere,"[2] written in 1947.

A generation later, in 1982, Peter Russel, a theoretical physicist and computer scientist by training, published his bestselling book, *The Global Brain*, subtitled, *Speculations on the Evolutionary Leap to Planetary Consciousness*. In it he promises, "We shall see that something miraculous may be taking place on this planet, on this blue pearl of ours. Humanity could be on the threshold of an evolutionary leap, a leap that could occur in a flash of evolutionary time, a leap such as occurs only once in a billion years."[3] He was, of course, talking about what in 1982, was soon to become known as the Internet. "electronically based telecommunications networks (telephones, radio, computer links) are like the billions of tiny fibers linking the nerve cells in the brain,"[4] Russell said. Whatever we call it, the Noosphere, the Global Brain, or the Internet, this notion that the Earth is developing a mind of its own isn't new and, today, isn't even farfetched.

What I like about de Chardin's description of it, as something "outside and above the biosphere, a new planetary layer," is the suggestion the boundaries of the Earth are now

[1] de Chardin, Pierre Teilhard, *The Future of Man*, Harper & Row, New York, NY, 1959, 1964, p. 156.
[2] p. 156.
[3] Russell, Peter, *The Global Brain*, J.P. Tarcher, Inc., Distributed by Houghton Mifflin Company, Boston, MA, 1982, p. 7.
[4] Ibid., p. 32

expanding outward, deeper into space, with this biologically liberated layer of invasive information. The Internet may not exactly dwell in outer space, though it is a world wide web of increasing information systems surrounding the globe, analogous to the formation of a neural network. Just as the Earth has an atmosphere, and a stratosphere, it now has a noosphere—a sphere of digital information. This network is now rapidly growing beyond the mere amassing of humanity's collected knowledge by also connecting all our technologies. It is turning into an Internet of things like automobiles, cellphones, streetlamps, cameras, even entire buildings and everything in them are being linked to the Internet.

Some are concerned about what this global brain, this thinking Earth, might mean for us mere humans, and there are legitimate reasons to be cautious. But we should also remember this new way of being is an extension of our transcendent selves. Like Zeus giving birth to Athena from his head, this budding intelligence is our brainchild, born not of our genes but of our memes. The connected global mind is a new power, a new ability, we are evolving for ourselves. The crucial part is not becoming mindless cells in its vast network, controlled by the radical groupthink and pile-on culture social media that is now attempting to force upon us through Facebook and Twitter. We must remain differentiated cells in the network of thinkers and things, not undifferentiated mindless automatons. But this has been an ongoing concern for our social species since long before the communications age came upon us.

Meanwhile, as liberated information continues evolving a mind of its own, our invasive species continues transcending the boundaries of our natural environment, the one environment many warn we must not try to leave, by venturing deeper into the Universe. On Oct. 4th, 1957, humanity launched Sputnik, it's first ever satellite into space. A month later, Sputnik II carried its first living passenger into space, a dog named Laika. In 1958, Explorer I became the first U.S. satellite successfully launched into space. All of these, of course, remained in Earth's orbit, but in 1959 our Soviet neighbors sent Luna I to the moon, an unmanned spacecraft that missed its moonshot but still became the first human piece of technology to transcend Earth's orbit. That same year NASA deployed a couple of spy satellites, captured the first ever photographs of Earth from space, and the Soviets launched a craft that made it to the surface of the moon, albeit a crash landing. In 1961 they launched a probe to Venus, which traveled for a week before contact was lost with it. That's the same year Yuri Gagarin became the first person in space, followed by Allen Shephard, the second human in space a month later. In 1962, the Soviets deployed another spy satellite and NASA succeeded in completing the first interplanetary flyby by sending a probe, the Mariner II, past Venus.

In 1964, the year I was born, the space race resulted in successful spacecraft designed to carry two to three passengers into space, and in 1965 cosmonaut Alexei Leonov was the first person to ever spacewalk. That same year an American, Ed White became the second man to walk in space, the Mariner 4 succeeded in a flyby past Mars, and there were three different

crewed missions completed by the Gemini program. In 1966, the Soviets successfully landed an unmanned craft on the moon. In 1968, the Apollo 7 and 8 missions allowed astronauts to orbit the Earth and the Moon, respectively, and in 1969, the Apollo 11 mission allowed the first human beings to walk on the moon.

In 1972, Pioneer 10 became the first spacecraft to transcend our solar system. In 1973, Skylab, the first space station was launched. In 1974, Mariner 10 flew over Mercury. In 1976 even as other nations were getting involved in space exploration, the Viking 1 landed on Mars, with Viking 2 already on its way. In 1977, Voyager 1 performed flybys past Jupiter and Saturn, even as Voyager 2 was heading for Uranus and Neptune. The same year the Soviets launched an orbital docking station. In 1978 the first GPS satellite was launched. In 1979, Pioneer 11 flew past Saturn. Since all these historic first time events, we've launched the Mir space station, developed reusable space shuttles, mapped the surface of Venus, sent probes to Jupiter, launched the Hubble Space Telescope, explored asteroids, deployed privately owned space labs, launched direct TV satellites, launched the International Space Station where more than 220 astronauts from 17 different countries have visited and lived on.

Today, the Voyager 1, which entered interstellar space in 2012, 12 billion kilometers from the Sun, represents the extent of our transcendence so far. There are also nearly 5000 satellites in orbit around our planet right now. Just this year, Elon Musk announced his company Starlink's plans to surround the planet with 12,000 satellites to provide instant, high speed internet access to everyone everywhere on the planet. So, whether we like it or not, in addition to having an atmosphere, stratosphere, and noosphere around the planet, we also now have a growing satesphere. Additionally, we have so many probes and landers on other planets, it's difficult to find a hard number these days. And now serious plans are in the works to develop floating space cities and to send people to Mars within the next decade.

To many, all of this may seem foolhardy and unnatural, or unimportant compared to the many problems we must solve right here on Earth. But, to me, it seems as natural as the first cells on Earth emerging from their primordial soup, and simple algae adapting to live on dry land, and fish crawling out of the sea, and mammals crawling back in. Today, it's still difficult to imagine life transcending its biological confines, or for biology to adapt to living outside Earth's atmosphere. But if we consider how far we've already come, recognizing since Sputnik was launched just 62 years ago, we have already made enormous encroachments into outer space, including the addition of new planetary layers, a noosphere and satesphere. If it is true, as Peter Russell said, we are amidst "a leap such as occurs only once in a billion years," it may be that our invasive species is beginning to climb out of its own primordial soup by adapting to and adopting the Universe itself as our new natural environment.

Ralph Waldo Emerson, the founder of Transcendentalism, once said, "We live in succession, in division, in parts, in particles. Meantime within [humanity] is the soul of the whole; the wise silence; the universal beauty, to which every part and particle is equally related; the

eternal One."[5] Maybe, as terrifying as leaving can be, as venturing forward into the unknown is, as difficult as it is for us to change, the strange drive within us to surmount these fears is but the transcendent Universe itself calling us home, to be at one with all that is. As Neil Armstrong said, when asked why we should go to the moon, "It's in the nature of [our] deep inner soul. We're required to do these things just as *salmon* swim upstream."

[5] Emerson, Ralph Waldo, *The Writings of Ralph Waldo Emerson*, ed. Brooks Atkinson, Random House, Inc., The Modern Library, New York, NY, 1940, p. 262.