

The Promise and Peril of Being Human

Psalm 8; Genesis 3:1-7; Revelation 21:1-4; 22-25; 22: 1-2;
Joel Garreau, *Radical Evolution*

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Today is August 9, 2009. Do you know what happened on this day in 1945? Well, I would not have become aware of August 9, 1945, had not our gracious host, Tapas, responded to my email giving him my theme for today – “The Promise and Peril of Being Human.” He wrote,

Interesting numerology. You speak on the perils and promise of human potential on August 9 at 11 am and August 9 1945, was Nagasaki Bombing day – mere coincidence, of course...

Well, coincidence or not, I replied to Tapas that at least he had provided my introduction and I did check out the Wikipedia piece on the 1945 bombing of Hiroshima on August 6 and Nagasaki on August 9 – the first and only use of the atomic bomb bringing horrific devastation and great loss of human life and bringing Japan to surrender.

I was sobered as I reviewed those days of terror and death, of devastation and the unleashing of atomic power into the world. Of that event, Einstein said famously,

The unleashed power of the atom has changed everything save our modes of thinking and we thus drift toward unparalleled catastrophe.

Or, in another citation –

The release of atom power has changed everything except our way of thinking...the solution to this problem lies in the heart of mankind. If only I had known, I should have become a watchmaker.

I am grateful that Tapas' reference to August 9, 1945, put me on this track because it reminded me that the issue of human progress has always been accompanied by promise and peril. The splitting of the atom was obviously in a class by itself beyond any emergent and any evolution to that point, except the dawn of consciousness and the radical evolution on whose threshold we stand today in terms of the Information Revolution, Genetics, Robotics and Nanotechnology likewise far exceeds the consequences of any previous

breakthrough in human progress. Nonetheless, there is a long history of human progress which has been welcomed and resisted.

In 2005 I immersed myself in this subject and gave a lecture entitled “The End of the Human Story.” As you may surmise, I was playing on the ambiguity of the word “End;” it can mean the point of termination – the game ended after midnight – or, it can mean the successful achievement of the purpose of an endeavor – as in, the project achieved its end of creating a new vision. Therein lies the ambiguity of my title: will the explosive expansion of technology lead to humanity’s demise – the end of the story? Or, might technology be the means whereby humanity realizes its divine intention, its purpose in process? Put another way: will technology lead us to the gates of Hell, the final conflagration, or usher us into Edenic bliss, the Garden of Paradise, the City of God?

Lest I build too great expectations with such cosmic queries, let me say at the outset that both consequences are possible – coming to our end, or realizing our end, and which possibility will prevail I do not know. No one knows. But, the value of reflection on the theme “Human and Technology” is bringing to awareness what must be the critical issue confronting the human family – not simply what as yet undreamed-of possibilities there are for technological development, but rather, given whatever technological advances that emerge, how will humanity respond in terms of control, utilization and application?

Technology is not a neutral instrument; it has and it will radically transform a cultural paradigm. Yet, at this moment in our cosmic journey, human decision-making can still determine whether technological development will spell our end or be a means of realizing the full blossoming of the human spirit – which would be simply Divine.

It is in coming to a sharpened awareness of the critical nature of the choices that even now confront the human family that the value of our theme lies. As one whose whole life has been given over to contemplating the human before the Face of God, I must admit that I have been shocked into a new awareness of the real situation of our present existence, literally teetering between the end and the End – between extinction and the next stage of human development.

Let me begin to address the subject by putting the issue of humanity and technology in an historical context. The tension between human values and technological development has a long history. Without attempting a full account of that history, let me simply point to what for me was new insight and understanding – the beloved Robin Hood of English legendary saga was not simply one who with his band of merry men took from the rich to aid the poor. In his *Rebels Against the Future*, Kirkpatrick Sale points out that the Robin Hood legends recount the struggle against the early English wool industry:

It is probable that one of the real figures at the center of the legend was the victim of an early industrial policy of the rising English monarchy to encourage a native wool industry by transforming some of the commonly held central forests into private grazing lands for sheep, and his troubles with the Sheriff of Nottingham no doubt stemmed from a clash between his desire to keep on using the woods for food and fuel, as his father and forefathers had before him, and the royal policy (proclaimed in 1217=18) of cutting them down for pasturage. This conflict between old and new, custom and commerce, was dramatic enough to fix itself in the stories of the locals, take life in several early narrative poems (most effectively in the *Lytell Geste of Robyn Hode* of 1495), and eventually be resurrected by several early 19th-century Romantic novelists (notably Scott, in *Ivanhoe*), from where it passes into modern films and fables....

But for all the enduring resonance of this tale, in historical fact it was the royal policy of clear-cutting and wool manufacturing over the forest commons that prevailed. The heartland forests were enclosed and harvested, laid bare for grazing, and within a few centuries nothing much was left of either the great Bardsdale or Sherwood forests but a few scattered clusters of conifers and a few stately oaks in tracts deemed unsuitable for development; wool weaving became the key industry of England and woolen cloth for centuries its most important export, an enterprise nurtured and protected by a succession of kings and parliaments down to the 19th century. Robin Hood's name may have lasted, and a legend about heroic commoners resisting the noble and the powerful may have become burnished by time, but in truth it was not the practice of robbing from the rich, nor the benefaction of the poor, that became the principle means of enterprise in middle England. (p. 2f)

Sale recounts the Robin Hood legend of the 13th and 14th centuries to introduce his history of the Luddites who are his "Rebels" whom he uses to address our contemporary crisis created by the present explosive technological advances.

It is fitting, and perhaps not accidental, that this triangle of central Britain, seven centuries after it immortalized Robin Hood, was precisely the site of the risings of the Luddites.

The Luddites – many of them weavers and combers and dressers of wool, but many of them artisans in the cotton trades that became increasingly important at the end of the 18th century – were, like Robin's Merry Men, victims of progress, or what was held to be progress. Having for centuries worked out of their cottages and small village shops on machines that, though far from simple, could be managed by a single person, assisted perhaps by children, they suddenly saw new, complex, large-scale machines coming into their settled trades, or threatening to, usually housed in the huge multistory buildings rising in their ancient valleys.

Worse still, they saw their ordered society of craft and custom and community begin to give way to an intruding industrial society and its new technologies and systems, new principles of merchandise and markets, new configurations of countryside and city, beyond their ken or control. And when they rose up against this, for fifteen tempestuous months at the start of the second decade of the 19th century, they did so with more ferocity and intensity than anything Robin Hood ever mustered, and were put down with far more force than anything King John ever commanded.

The Luddites took their name from a mythical Ned Ludd – whose origins are still obscure... – but they were conscious throughout that they were traveling on ground trod by an earlier set of courageous troublemakers; one of the earliest Luddite letters was posted from “Robin Hood’s Cave,” another was said to have come from “Ned Ludd’s office, Sherwood Forest,”... (p. 3)

Sale writes of the critical nature of the Luddite rebellion as the Industrial Revolution was transforming English life. The response of the English establishment threatened to betray the very character of the nation, sensing as they did that the whole future of industrialization was at stake. Sale writes,

... the various Luddite armies that operated in 1811 and 1812 were so carefully organized and disciplined and so effective in their attacks, causing damage to machines and property that amounted to more than £100,000 that they seemed a strong and highly threatening movement of a kind Britain had not known before – of “a character of daring and ferocity,” the *Annual Register* for 1812 said, “unprecedented among the lower classes in this country.” Then, too, they had enough popular support in the manufacturing districts to be able to carry on their secret, illegal activities for months on end without being betrayed, despite official bribes and threats, nighttime arrests, and interrogations, suggesting to certain minds at least that they were only the most visible part of a very widespread insurrectionary – possibly revolutionary – tendency in the land....

Last and perhaps most important, the Luddites were understood to represent not merely a threat to order, as riotous mobs or revolutionary plotters of the past, but, in some way not always articulated, to industrial progress itself. They were rebels of a unique kind, rebels against the future that was being assigned to them by the new political economy then taking hold in Britain, in which it was argued that those who controlled capital were able to do almost anything they wished, encouraged and protected by government and king, without much in the way of laws or ethics or customs to restrain them. The real challenge of the Luddites was not so much the physical one, against the machines and manufacturers, but a moral one, calling into question on grounds of justice and fairness the

underlying assumptions of this political economy and the legitimacy of the principles of unrestrained profit and competition and innovation at its heart. Which is why the architects and beneficiaries of the new industrialism knew that it was imperative to subdue that challenge, to try to deny and expunge its premises of ancient rights and traditional mores, if the labor force were to be made sufficiently malleable, and the new terms of employment sufficiently fixed, to allow what we now call the Industrial Revolution to triumph unimpeded. (p. 4f)

The impact and implications of the Industrial Revolution were creating serious questions and deep foreboding in the minds and hearts of many of the thoughtful and reflective English folk of that time. Mary Wollstonecroft Godwin (living with but as yet not married to the poet Percy Bysshe Shelley), Shelley, his friend Lord Byron and Byron's physician, Dr. John Polidori, spent the summer of 1816 in Switzerland, a summer of perpetual rain. Creating their own entertainment, they decided to see who could write the most frightening ghost story. Mary Shelley was 18 when she began to write her story and 21 when the book was published under the title *Frankenstein, or the Modern Prometheus* (1818). The numerous film versions of the story are in the horror film genre and mask Shelley's real intention in the novel.

The name Frankenstein has been switched to the Monster in the dramatic versions of stage and film whereas, in the novel, Victor Frankenstein is the student experimenter fascinated with the power of electricity in lightning. He determines to pursue the secret of life. The reference in the title to Prometheus reveals what was on Shelley's mind as she wrote – a modern Prometheus, not thief of fire, but attempting to become the Creator.

Patricia A. Neal, in an essay entitled "Mary Shelley's Frankenstein: Myth for Modern Man," stresses the serious intention of the author about concerns which continue very much with us as we wrestle with the tension between human values and the explosive technological advances we are witnessing. Neal writes,

The power of the myth of an unattended scientific creation, left to destroy innocent lives, assumes importance in the final decade of the twentieth century. The book questions the morality of Frankenstein's actions. Did he have a right to create and abandon the creature? In her novel, Mary Shelley anticipated the problem of a destructive force created by man, a force with no genuine means of control.

Kirkpatrick Sale likewise recognizes Shelley's serious purpose in the writing of her myth –

...Mary Shelley's prescient tale of techno-madness, *Frankenstein*, published in 1818, was so vivid a message of the dangers of mechanization and the problems of scientific invention – "You are my creator," the

monster tells the scientist at the end, “but I am your master” – that it has survived to today, unforgettable....

Thus the recognition of the potential and peril of scientific knowledge and technological development has a long history, but the pace and peril of that development is increasing in our day, not gradually, but exponentially, creating, according to Kirkpatrick Sale, more passion and urgency than at any time in the past two centuries.

This is the subject of a fascinating book by Joel Garreau, a journalist with *The Washington Post*, entitled *Radical Evolution*, the sub-title being “The Promise and Peril of Enhancing Our Minds, Our Bodies – and What It Means To Be Human.” A reviewer says of the author “...he’s neither a technology booster nor a Luddite. The questions his moral quandaries raise are among the deepest questions we know how to ask: What kind of creatures are we – the apelike animals from which we evolved, or the angels we imagine we can become?” Author Kevin Kelly writes,

It isn’t often an author gets to herald the biggest news in the last 10,000 years. But you’ll get the full, uncensored, mind-blowing report here in this entertaining and surprisingly deep book. Meet soldiers who don’t sleep, animals controlled with joy sticks, computers controlled by merely thinking, the blind driving cars, and parents designing their kids – and that is just what is happening right now. Veteran scout Joel Garreau prepares ordinary readers for the ultimate question of this century: Who do you think we should be? He makes it clear that as of today, human nature is now under the control of humans, and we *are* doing something about it – but we aren’t aware of it. To guide you through this boggle Garreau offers astonishments, conundrums, and sanity.

I cite Kelly because he points to what most of us, the uninitiated, might write off as far-out science fiction but is present day reality in the advanced laboratories of our most elite research universities and agencies. Garreau declares we are at an inflection point in history. The dictionary defines inflection as 1) “The act of turning from a direct line, or the condition of being so turned,” 2) “A turn, bend, or curve,” ...5) “A change of a curve or arc from convex to concave or the reverse.” This is how Garreau describes it:

We are at an inflection point in history. For all previous millennia, our technologies have been aimed outward, to control our environment. Starting with fire and clothes, we looked for ways to ward off the elements. With the development of agriculture we controlled our food supply. In cities we sought safety. Telephones and airplanes collapsed distance. Antibiotics kept death-dealing microbes at bay.

Now, however, we have started a wholesale process of aiming our technologies inward. Now our technologies have started to merge with our minds, our memories, our metabolisms, our personalities, our progeny and perhaps our souls. Serious people have embarked on changing humans so much that they call it a new kind of engineered evolution – one that we direct for ourselves. “The next frontier,” says Gregory Stock, director of the Program on Medicine, Technology and Society at the UCLA School of Medicine, “is our own selves.”

The people you will meet in *Radical Evolution* are testing these fundamental hypotheses:

We are riding a curve of exponential change.

This change is unprecedented in human history.

It is transforming no less than human nature.

This isn't fiction. You can see the outlines of this reality in the headlines now. You're going to see a lot more of it in just the next few years – certainly within your prospective lifetime. We have been attempting to transcend the limits of human nature for a very long time. We've tried Socratic reasoning and Buddhist enlightenment and Christian sanctification and Cartesian logic and the New Soviet Man. Our successes have ranged from mixed to limited, at best. Nonetheless, we are pressing forward, attempting once again to improve not just our world but our very selves. Who knows? Maybe this time we'll get it right. (p. 6)

This isn't fiction; it is that which I want to stress. Garreau is not into sensationalism; he is not writing to scare, nor is he simply wanting to sell books. He is a serious writer writing about the most profound questions facing the human community. Neither is this a book about technology per se. It would not be on my reading list if it were. I am technologically challenged but I do sport a titanium hip, I use a cell phone sparingly and I am able to utilize about five per cent of the capacity of my computer to work the wonders of cyberspace. I mention this because I don't want you to think you are in for a lecture on the intricacies of the latest technological developments. What I do hope to do is make you aware that technology has advanced to the point where most people now living will be faced with real existential questions about how they will live their lives and maybe not as much their lives but the lives of their children and grandchildren. Garreau opens this up with a simple question parents might ask their son or daughter returning from their university – “What are your classmates like, honey?” The answer reveals some of the ways humans will be able to be enhanced given the technology now available or in process of being perfected:

How does she explain what the enhanced kids are like? She wonders. She knows her dear old parents have read in their newsmagazines about some

of what's available. But actually dealing with some of her new classmates is decidedly strange.

- They have amazing thinking abilities. They're not only faster and more creative than anybody she's ever met, but faster and more creative than anybody she's ever imagined.
- They have photographic memories and total recall. They can devour books in minutes.
- They're beautiful, physically. Although they don't put much of a premium on exercise, their bodies are remarkably ripped.
- They talk casually about living a very long time, perhaps being immortal. They're always discussing their "next lives." One fellow mentions how, after he makes his pile as a lawyer, he plans to be a glassblower, after which he wants to become a nanosurgeon.
- One of her new friends fell while jogging, opening up a nasty gash on her knee. Your daughter freaked, ready to rush her to the hospital. But her friend just stared at the gaping wound, focusing her mind on it. Within minutes, it simply stopped bleeding.
- This same friend has been vaccinated against pain. She never feels acute pain for long.

These new friends are always connected to each other, sharing their thoughts no matter how far apart, with no apparent gear. They call it "silent messaging." It almost seems like telepathy.

They have this odd habit of cocking their head in a certain way whenever they want to access information they don't yet have in their own skulls – as if waiting for a delivery to arrive wirelessly. Which it does.

For a week or more at a time, they don't sleep. They joke about getting rid of the beds in their cramped dorm rooms, since they use them so rarely.

Her new friends are polite when she can't keep up with their conversations, as if she were handicapped. They can't help but condescend to her, however, when she protests that embedded technology is not natural for humans.

That's what they call her – "Natural." In fact, that's what they call all those who could be like them but choose not to, the way vegetarians choose to abstain from meat.

They call themselves “Enhanced.” And those who have neither the education nor the money to even consider keeping up with enhancement technology? These they dismiss as simply “The Rest.” The poor dears – they just keep falling farther and farther behind.

Everyone in your daughter’s law school takes it as a matter of course that the law they are studying is changing to match the new realities. The law will be upgraded. The Enhanced believe, just as *they* have new physical and mental upgrades installed every time they go home. The technology is moving that fast.

In fact, the paper your daughter is working on over the holiday concerns whether a Natural can really enter into an informed-consent relationship with an Enhanced – even for something like a date. How would a Natural understand what makes an Enhanced tick if she doesn’t understand how he is augmented?

The law is based on the Enlightenment principle that we hold a human nature in common.

Increasingly, the question is whether this still exists. (p. 7f)

Garreau doesn’t just throw out portraits of the “Enhanced,” as he calls them, to shock, nor are these preposterous constructions of his imagination. He references all these seemingly outlandish capacities and characteristics to actual scientific work in progress. The most ambitious work on the most “far out” ventures is carried out under the auspices of the United States’ Defense Advanced Research Projects Agency, or DARPA – one of the world’s foremost drivers of human enhancement. Not surprisingly, it is national defense (or is it imperial offense) that is the driving force of this enterprise. DARPA doesn’t do the actual work but commissions leading research universities to do the research and experimentation – 90% of its budget of billions of dollars is spread around to schools like Stanford, MIT, Carnegie Mellon. If it determines there is a need for companies to exist, it sees that they are funded in order to be founded – companies such as Sun Microsystems, Silicon Graphics, Cisco Systems. NASA was spun off from DARPA. The list of subsidized companies today is in the information industries because that is where the pay-off has been in the last few decades. In the eighties the push was for biologically inspired robots, since the nineties the focus has increasingly been on human biology through the Defense Sciences Office. I cite a paragraph simply to give you a sense of the radical potential of what is in process:

Blinded rats are being made to see by Harry Whelan, a professor of neurology at the Medical College of Wisconsin. In a battlefield, a laser powerful enough to burn is a very lethal thing if it is aimed at pilots’ eyes. Using light in the near-infrared spectrum, however, in a process called

photo-biomodulation, wound healing is accelerated. Vision in rats is being largely restored in anywhere from 5 to 24 hours – not yet quick enough to help pilots, but this is a work in progress. The research is sufficiently advanced that it is about to be tried on monkeys. The hope is that it will also mend wounds to skin, bone, neurons, cartilage, ligaments and tendons within four days. Whelan is also exploring what the process might do for spinal cord injuries, Parkinson's disease and brain tumors, as well as tissue and organ regeneration. If it works, he will have created something akin to the "physiostimulator" of the original *Star Trek*, the curative device Bones waves over injuries to heal them. The Navy SEALs are deeply interested in that.

Henry is also directing a gaggle of researchers who have discovered that the natural chemical cascades in the body that stop bleeding can be triggered by signals from the brain. The implication of this is that you might be able to train people to stop hemorrhaging within minutes, simply by concentrating their mind on their wound. (p.27)

For one not accustomed to the growing edge of the scientific-technological revolution, such possibilities are mind-boggling. But once again, this is not fantasy but hard science. Garreau has had his own "aha" moments when he suddenly awakened to the incredible dimensions of that about which he writes.

Such a moment came as I realized that this story was not about computers. This cultural revolution in which we are immersed is no more a tale of bits and bytes than the story of Galileo is about paired lenses. In the Renaissance, the big deal was not telescopes. It was about realizing that the Earth is a minor planet revolving around an unexceptional star in an unfashionable part of the universe. Today, the story is no less attitude-adjusting. It is about the defining cultural, social and political issue of our age. It is about human transformation.

The inflection point at which we have arrived is one in which we are increasingly seizing the keys to all creation, as astounding as that might seem. It's about what parents will do when offered ways to increase their child's SAT score by 200 points. It's about what athletes will do when encouraged by big-buck leagues to put together medical pit crews. What fat people will do when offered a gadget that will monitor and alter their metabolisms. What the aging will do when offered memory enhancers. What fading baby boomers will do when it becomes obvious that Viagra and Botox are just the beginning of the sex-appeal industry. Imagine that technology allows us to transcend seemingly impossible physical and mental barriers, not only for ourselves but, exponentially, for our children. What happens as we muck around with the most fundamental aspects of our identity? What if the only thing that is truly inevitable is taxes? This is

the transcendence of human nature we're talking about here. What wisdom does transhuman power demand? (p. 11)

"Moore's Law" is named after Gordon E Moore who was one of the founders of Intel whose computer chip ushered in a new age. In 1965 he predicted that the complexity of microchips would double every year for the next ten years.

This came to be called "Moore's Law" – "The power of information technology will double every 18 months, for as far as the eye can see." And it has proven to be the case. This doubling of the power of information technology has moved the curve of development in a straight line upward bringing us to the inflection point in human history we are experiencing and, Garreau writes, "The Curve implies one of the all-time changes in the rules. Those who study it call it "The Singularity." (p. 67)

Garreau explains The Singularity concept thus:

Vinge (rhymes with *stingy*, which he distinctly is not) in 1993 introduced the idea of The Singularity to describe huge but unpredictable social change driven by The Curve. In a seminal academic paper delivered to a NASA colloquium he wrote, "I argue in this paper that we are on the edge of change comparable to the rise of human life on Earth." He's anticipating the possibility of greater-than-human intelligence. He's talking about some form of transcendence.

As a metaphor for mind-boggling social change, The Singularity has been borrowed from math and physics. In those realms, singularities are the points where everything stops making sense. In math it is a point where you are dividing through by zero, for example. The result is so whacked out as to be meaningless. Physics has its black holes – points in space so dense that even light cannot escape their horrible gravity. If you were to approach one in a spaceship, you would find that even the laws of physics no longer seemed to function. That's what a Singularity is like. "At this singularity," writes Stephen Hawking in *A Brief History of Time*, "the laws of science and our ability to predict the future would break down." Another borrowed metaphor is "the event horizon," the point of no return as you approach a black hole. It is the place beyond which you cannot escape. It is also the point beyond which you cannot see.

Some people think we are approaching such a Singularity – a point where our everyday world stops making sense. They think that's what happens when The Curve goes almost straight up. The sheer magnitude of each doubling becomes unfathomable. ^a (p. 71f)

A helpful technique of Garreau is his condensing in a paragraph the major subjects he handles as he seeks to portray the present era in which we find

ourselves – the concepts of The Curve, The Singularity and the three possible futures that lie before us as a human global community. He gives us scenarios. He begins this method with a description of a scenario.

What are Scenarios?

Scenarios are rigorous, logical, but imaginative stories about what the future might be like, designed to help people plan. Scenarios are not predictions. They are tools for preparation. Recall how pilots just returning from combat – no matter how complex the conditions they encountered – frequently say, “It wasn’t as bad as the simulator.” That is the value of scenarios. Simulators do not predict the future; they allow those who use them to carefully and calmly anticipate and rehearse their response to almost any sudden eventuality. Think of them as idea maps.

Scenarios have rules: they must conform to all known facts; identify “predetermined” – future events so locked-in by those of the past that they can usefully be viewed as inevitable; identify “critical uncertainties” – possibilities that logically might occur in the future but which are both highly uncertain and highly important; identify “wild cards” – possible but highly improbably eventualities that would have great impact should they occur; reveal “embedded assumptions” – unprovable and often unexamined foundations on which our thinking about the future rests; and, identify in advance certain “early warnings” that serve as an alert that a particular scenario is coming to pass. (p. 78f)

With this description of a Scenario, Garreau describes what he has just discussed – The Curve and The Singularity. Subsequently he will put in capsule form what is his central purpose – describing three possible scenarios of the future given the present state of our science and technology:

A Scenario of Heaven, of Hell and of what he calls Prevail. Reviewing his earlier discussion, he summarizes both The Curve and The Singularity.

The Curve Scenario

In this scenario, information technology continues to explode at a rate comparable to that from 1959 through the early 21st century. These unprecedented rapid doublings of information power and dramatically reduced costs continue to spawn new transformative technologies, such as genetics, robotics and nanotechnology. These in turn also proceed to grow at an unprecedented rate, merging and intertwining to produce novel opportunities and challenges. Within the current human generation, these events transform society and ultimately test the meaning of human nature itself.

Predetermined elements:

There are Curves of exponential change.

Many of these describe the realities of technology.

These Curves especially describe the increase in capabilities of information technology.

The Curves of information technology increasingly enable new Curves of exponential change to emerge in other fields, especially genetics, robotics and nanotechnology.

All of these Curves of exponential change have major impacts on society, culture and values.

Critical uncertainties:

Are the Curves of exponential change smoothly accelerating, or will they display unexpected slowdowns, stops or reversals?

Are these Curves of exponential change under the control of society's culture and values, or are they impervious to human intervention? (p. 8of)

The Singularity Scenario

(Builds on The Curve Scenario)

In this scenario, The Curve of exponentially increasing technological change is unstoppable because new discoveries confer great advantage on those who adopt them – economically, militarily and even artistically.

Either intentionally or accidentally, this leads, before 2030, to the creation of greater-than-human intelligence. This greater-than-human intelligence in turn proceeds to replicate and improve itself at such a rate as to exceed comprehension. This produces an inflection point in history called The Singularity, comparable to that in which humans rose from the lower animals. (Alternatively, The Singularity is triggered simply by the rate of change accelerating so greatly as to be beyond understanding, with or without the creation of greater-than-human intelligence.) The impact on everyday life is profound, as if we are being swept up by an avalanche. Succeeding scenarios in this book do not depend on The Singularity coming about. It would, however, dramatically influence the speed and scope of their outcome.

Predetermined elements:

There are Curves of exponential technological change.

These Curves of exponential change especially describe information technology.

These Curves of information technology increasingly enable new Curves of exponential change in other fields, especially genetics, robotics and nanotechnology.

All of these Curves of exponential change have major social, cultural and value impacts.

Critical uncertainties:

Are The Curves of exponential change smoothly accelerating, or will they display unexpected slowdowns, stops or reversals?

Are these Curves of exponential change under the control of society's culture and values, or are they impervious to human intervention? Will software improve at a rate as great as hardware, or will human ingenuity be stymied by the sheer size, complexity and bugginess of the software required?

If these Curves are predetermined, must they result in the creation of infinite change?

If these Curves are predetermined, must they result in greater-than-human intelligence?

If infinite change or greater-than-human intelligence is inevitable, will this happen soon – that is, before 2030?

Embedded assumption:

The only event that can alter this path is a cataclysm that will ruin civilization, such as nuclear war. (p. 82f)

With the above framework for confronting the present moment in human history, Garreau moves to his purpose in writing – setting forth three possible Scenarios – as noted above:

At least three alternative futures flow from this accelerated change, according to knowledgeable people who have thought about all this, as you will see in ensuing chapters. The first scenario is one in which, in the next two generations, humanity is rapidly replaced by something far more grand than its motley self. Call that The Heaven Scenario. The second is the one in which in the next 25 years or so, humanity meets a catastrophic end. Call it The Hell Scenario. You will find chapters on each, because both scenarios are plausible, and either would lead to the end of human history as we know it, and soon. The third scenario is more complex. It is the one we might call The Prevail Scenario. In this scenario, the future is not predetermined. It is full of hiccups and reverses and loops, all of which are the product of human beings coming to grips with their own destinies. In this world, our values can and do shape our future. We do have choices; we are not at the mercy of large forces. We can prevail.

The Heaven Scenario – The Vision of Ray Kurzweil

Ray Kurzweil may be one of the greatest creative geniuses to have ever lived. His imagination seems never to cease and he has the brilliance to actualize that of which he dreams. Soon after college he developed three technologies – the first practical flatbed scanner which resulted in a multibillion-dollar industry. He invented the character recognition device that could read any typeface and he invented the first full text-to-speech synthesizer which together brought The Kurzweil Reading Machine to life. Kurzweil has created nine technology companies that continue to be leaders in their fields.

Kurzweil has become famous however because of his writing. The 1989 *The Age Of Intelligent Machines* predicted the World Wide Web, the chess championship by a computer and the dominance of intelligent weapons in warfare – all pretty far-fetched at the time. In 1999 he published *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* in which he predicted, because of The Curve, many intelligences will roam the earth that are not traditional humans. His 2005 work, *The Singularity Is Near: When Humans Transcend Biology*, goes further, laying out the case for the imminent and cataclysmic upheaval in human affairs associated with The Singularity:

But even that isn't the audacious part.

What makes Kurzweil an outrage to some and an inspiration to others is that he is relentlessly and fiercely optimistic about these futures. He uses charts and graphs to systematically portray a near future that to some seems indistinguishable from the Christian version of paradise. On top of everything else, he is convinced that medicine is moving sufficiently fast that any person who can stay healthy for the next 20 years may so benefit from the explosion in biological technology as to be immortal. He lays out an extensive scientific, nonreligious, non-New Age case for personally planning to live for a thousand years. When challenged, he doesn't retreat from his logic at all. Once, to rattle his cage, I paraphrased the author Arthur C. Clarke's renowned line, "Any sufficiently advanced technology is indistinguishable from magic." I asked him, So, Ray, what are you saying? That any sufficiently advanced technology is indistinguishable from angels? He did not back off an inch. "Depends on what you mean by angels," he replied.

I call his scenario Heaven. (p. 90f)

Kurzweil was born of Viennese Jews who fled the Nazi Holocaust coming to the United States where he was born. He still belongs to a Reform temple but more as a cultural identification. His parents, wishing to avoid the provincialism of narrow religions, joined a Unitarian church which introduced Ray to a broad spectrum of religious understanding through which he came to understand the different religious stories as speaking the same truth.

Today his is a "Buddhist's view of God – as the sort of life force, the force of creativity, as opposed to a specific cranky personality that makes deals with humanity and gets mad and exacts vengeance."

This worship of a life force fuels his optimism about the coming transcendence of human nature. "What we see in evolution is increasingly accelerating intelligence, beauty. We find evolving organisms, like humans, that are capable of higher emotions like love. I mean, if you go to the point where there were just reptiles, there was no love. They don't have much emotional intelligence. They don't have art, music. So part of

the evolutionary process – and this has continued with our technological growth of human cultural and technological history – is an increase of those higher emotional, intelligent functions. We see exponentially greater love.

“Even 200 years ago, 98 or 99 percent of human beings lived lives of utter desperation. Extreme poverty. Extreme labor. Spending all their time to prepare the evening meal. Extremely disaster-prone. No social safety nets. Now at least an increasing portion of human civilization is free of that level of desperation. So our ability to appreciate arts and music and to have stable relationships is increasing. That was relatively difficult to do even 200 years ago, let alone thousands of years ago.” (p. 93)

Garreau summarizes the core of Kurzweil’s thinking thus:

The core element of Kurzweil’s thinking is that The Curve of exponentially increasing technology is rising smoothly, as if on rails. It is in command, in his view, and unstoppable. Everything flows from that. He sees The Curve as a force of nature. He sees it as an extension of evolution. He does not particularly see The Curve as something humans chose to create. Like evolution, it is simply a pattern of life to be recognized, the outcome of billions of small actions. He calls it “The Law of Accelerating Returns.” In his view, nothing any one country or collection of countries can do will deflect it or even slow it down. Forget oil shocks or climate change. The only possible limit he sees is a complete and catastrophic collapse of civilization or the extinction of the human species, worldwide, and he only inserts that as something of a rhetorical footnote.

“Exponential progress, in recent times, has marched right through” disasters such as the Depression and World War II, he observes. “It really is an evolutionary process. Biological evolution is full of unpredictable events like visitors from outer space in the form of meteors and asteroids. But nonetheless, out of that chaos comes a very smooth curve. Now the progress is so rapid that The Curves are on a very fast track. But they still emerge from an evolutionary process that is full of disruption. I mean, a lot of people ask me, “Well, now with 9/11 things must be different? Or with the high-tech recession and the meltdown of communications and Internet stocks, surely that has disrupted these curves?” Well, no they haven’t, Kurzweil says. (p. 94)

It is difficult to dispute Kurzweil’s claim that the Curve is simply the ongoing march of the cosmic evolutionary process into which we humans have come to participate and, to some extent, direct. A brief historical review is fascinating as Garreau sets it out.

The essence of The Heaven Scenario is stealing fire from the gods, breathing life into inert matter and gaining immortality. Our efforts to become something more than human have a long and distinguished genealogy. Tracing the history of those efforts illuminates human nature. In every civilization, in every era, we have given the gods no peace.

Efforts to transcend our origins begin in the most primitive of times. Sorcerers would create a likeness of a living thing and, with the rituals of magic, seek to animate it. In our earliest epic, the Sumerian tale of Gilgamesh, the climax is the king seeking, finding and losing the secret of immortality. Barely three pages into Genesis, the serpent is telling Eve that she doesn't have to worry about losing immortality by tasting of the fruit of knowledge. No! You will not die! God knows in fact that on the day you eat it your eyes will be open and you will be like gods." He says. (Not coincidentally, one of the biggest attractions of Christianity, even as an upstart religion, was its promise of eternal life.) Ancient Greece was full of heroes harassing the deities. Prometheus not only created humans, teaching them many of their useful skills, but he filched fire for them. Daedalus confounded King Minos by crafting wings of wax and feathers to flee Crete. His son Icarus, of course, flew too close to the sun, giving us one of our earliest warnings against taking presumptuous pride in our technologies. But remember, Daedalus did succeed – his mythic wings worked, and ancient Greece gave us the tools of logic, skepticism and natural philosophy that became the underpinnings of science. The market for harvest and fertility goddesses has never been the same.

The cultural humanism of the Renaissance pushed ancient pieties aside. *Make something of yourself!* was its message to mankind. Human nature was not predetermined by anybody's secondhand image and likeness in this view. We could shape ourselves to make the world better. Pico della Mirandola's 1486 *Oration on the Dignity of Man*, the manifesto of the Italian Renaissance, eloquently centers all attention on human capabilities. In it, says God to Adam: "We give you no fixed place to live, no form that is peculiar to you, nor any function that is yours alone. According to your desires and judgment, you will have and possess whatever place to live, whatever form, and whatever functions you yourself choose."

Indeed, in 1580, the kabbalistic Jews of Prague imagined creating a Golem – an artificial man made from clay – who would protect them from persecution. Galileo, as he laid the foundations of modern science, believed that for peering directly into the mind of God, there was nothing like a telescope. It was more profitable to study the deity's handiwork than it was to study scripture. "Philosophy," he wrote, "is written in this grand book, the universe, which stands continually open to our gaze."

The Age of Enlightenment elevated scientists over priests. The notion was that the logically deduced laws that governed human behavior were an even purer expression of God's law than that which could be gathered from scripture. Since God's law will always work to good ends, the same must be true of the natural laws governing our individual lives, this hypothesis concluded. Francis Bacon was among the first to see critical reasoning as a means of finding the destiny and nature of man. "The formation of ideas and axioms by true induction is no doubt the proper remedy to be applied for the keeping off and clearing away of idols," Bacon wrote in *Novum Organum* in 1620. He saw it as a new grounding for morality and, indeed, the perfection of society. The idea of a rationally discovered natural law to achieve a heaven on earth would fuel both the American and French revolutions....

In 1780, Benjamin Franklin wrote to the chemist, biologist and minister Joseph Priestley, "The rapid progress true science now makes, occasions my regretting sometimes that I was born too soon. It is impossible to imagine the height to which may be carried, in a thousand years, the power of man over matter. We may, perhaps, deprive large masses of their gravity, and give them absolute levity, for the sake of easy transport. Agriculture may diminish its labor and double its produce; all disease may by sure means be prevented or cured (not excepting even that of old age), and our lives lengthened at pleasure..... (p. 106f)

Turning from Kurzweil, Garreau points to a document of 415 pages entitled *Converging Technologies for Improving Human Performance*. The document is the joint publication of the National Science Foundation and The United States Department of Commerce and affirms "It is time to rekindle the spirit of the Renaissance" to achieve "a golden age that will be a turning point for human productivity and quality of life. (p. 112) The report concludes, "The twenty-first century could end in world peace, universal prosperity, and evolution to a higher level of compassion and accomplishment." (p. 114)

Garreau points out that the leading scholars of this aspect of The Heaven Scenario point to the future of human genetics. He cites Gregory Stock, director of the Program on Medicine, Technology, and Society at The School of Medicine at UCLA:

Stock's version of The Heaven Scenario departs from Kurzweil's. He doesn't think humans will transcend because of computers. He thinks humans will transcend because of genetic engineering. Such biological remodeling is "a plausible way for people to overcome their bodily frailties, but a larger game is afoot," he says. It is "biology's bid to keep pace with the rapid evolution of computer technology."

“No one really has the guts to say it, but if we could make better human beings by knowing how to add genes, why shouldn’t we?” he approvingly quotes James Watson, co-winner of the Nobel prize for discovering the structure of DNA, as saying. The titles of several of Stock’s books display his position. One is called *Redesigning Humans: Our Inevitable Genetic Future*. An earlier one is called *Metaman: The Merging of Humans and Machines into a Global Superorganism*.

“To not be human in the sense we use the term now” is the fate of our descendants, Stock says. We will soon see humans as physically and intellectually divergent as “poodles and Great Danes.” But the passing of people like us is hardly a tragedy, he believes. “Unlike the saber-toothed tiger and other large mammals that left no descendants when our ancestors drove them to extinction, *Homo sapiens* would spawn its own successors by fast-forwarding its evolution.” (p. 115)

The acronym GRIN stands for four interrelated technologies that together are in process of modifying human nature – Genetics, Robotics, Information and Nano processes. Beyond what has been discussed about Information and Genetics, amazing possibilities are being realized in nanotechnology and robotics but to discuss that here in a meaningful way is beyond both this writer’s capacity and purpose. Rather let me bring this discussion of The Heaven Scenario to conclusion. Garreau concludes The Heaven Scenario by returning to Kurzweil.

Do you believe in a God you plan on meeting when you die? I ask.

“I’m not planning to die,” Kurzweil responds. “I expect to use the power of ideas. I am a survivor as an entrepreneur and a human being. It’s my plan to be involved in this next phase of humanity where we get past some of the frailties of these Version 1.0 bodies we have. The way to ‘meet our maker,’ so to speak, is, in fact, by staying alive. We will be part of this very rapid explosion of intelligence, and beauty, and a very rapid acceleration of this evolutionary process. And that, to me, is what God is. Evolution, I think, is a spiritual process because it moves closer to what we have considered God. It moves closer to infinity.”

I am nonplussed by this answer. He is not talking about us someday meeting God.

He is talking about us *becoming* God.

Aware of how this sounds, he rephrases a little. “I don’t think we actually ever become God. But we do become more God-like,” he clarifies.

He then barrels right back to a grand view of The Heaven Scenario. “I see it, ultimately, as an awakening of the whole universe. I think the whole universe right now is basically made up of dumb matter and energy and I think it will wake up. But if it becomes transformed into this sublimely intelligent matter and energy, I hope to be a part of that.”

He is talking about participating in the creation of Heaven. (p. 128f)

That is radical evolution indeed; Garreau has titled his account accurately and his portrayal of the present state and future potential of the exploding and intertwining scientific-technological enterprise backs up the claim that we are on the cusp of radical evolution. Not surprisingly, not everyone agrees that the scenario in process is one of “Heaven.” Equally brilliant and responsible leaders in the fields of science and technology suggest with alarm that we are on the threshold of Hell. The most articulate spokesperson for such a claim is Bill Joy.

The Hell Scenario – The Joyless Fears of Bill Joy

Though Joy sloughs it off, he has been called “The Edison of the Internet”. Garreau affirms the comparison.

Yet the comparison is not all wrong. Joy’s had a hand in some of the most important aspects of the Net. In 1978, while still a grad student, Joy became the principal programmer for a Defense Advanced Research Projects Agency project inventing the Berkeley Systems Distribution (BSD), the first operating system linking computers over this newfangled thing that would come to be called the Internet. (“It was fun,” he says, predictably enough.) In the early 21st century, the BSD architecture was still the main rival to Microsoft’s server system, being the basis of Apple’s OS X operating system and Sun’s machines, and an underpinning of Linux. In 1982, Joy married that system to a cheap but powerful computer called the S.U.N. workstation, after the Stanford University Network. This is how he wound up as chief scientist of Sun Microsystems, until he resigned the post in 2003....

Joy enjoys a reputation in Silicon Valley as thoughtful and level-headed. “Nobody is more phlegmatic than Bill,” says Stewart Brand, the Internet pioneer. “He is the adult in the room.”

That’s why it came as such a shock in March 2000 when this godfather of the Information Age predicted “something like extinction” of the human race within the next generation. Most extraordinarily, he blamed it on the accelerating pace of technological change he had helped create. He intended his warning to be reminiscent of Albert Einstein’s famous 1939 letter to President Franklin Delano Roosevelt alerting him to the possibility of the atomic bomb. (p. 137f)

In the journal *Wired*, April, 2000, Bill Joy wrote a powerful essay in which he expressed his shock at the rapid advance of the technology in which he himself was engaged and the potential for bringing the human story to its end. The essay is entitled “Why the Future Doesn’t Need Us,” and a bold print subtitle gives the essence of the piece – **Our most powerful 21st-century technologies – robotics, genetic engineering, and nanotech – are threatening to make humans an endangered species.**

Bill Joy relates the moment that his unease with the whole current direction in which new technologies are being created arose. At a telecom conference, he listened to a Berkeley philosopher, John Searle, discuss with the famous inventor and futurist, Ray Kurzweil, the acceleration toward the time we were going to become robots or fuse with robots or something like that. John Searle said it couldn't happen because the robots couldn't be conscious, but Kurzweil said such a phenomenon was a near-term possibility. Joy writes,

I was taken aback, especially given Ray's proven ability to imagine and create the future. I already knew that new technologies like genetic engineering and nanotechnology were giving us the power to remake the world, but a realistic and imminent scenario for intelligent robots surprised me.

Kurzweil gave Joy a preprint of his then forthcoming book, *The Age of Spiritual Machines* in which he described the utopia he foresaw – One in which humans gained near immortality by becoming one with robotic technology..

Joy was sobered and his unease intensified; he felt certain the dangers were being underestimated, failing to understand the potential of a tragic outcome. He found himself most troubled by a passage detailing a dystopian scenario – that is a scenario of a state or situation in which conditions and the quality of life are terrible. This is the disturbing passage which Joy introduces with the subheading,

The New Luddite Challenge

First let us postulate that the computer scientists succeed in developing intelligent machines that can do all things better than human beings can do them. In that case, presumably, all work will be done by vast, organized systems of machines and no human effort will be necessary. Either of two cases might occur. The machines might be permitted to make all of their own decisions without human oversight, or else human control over the machines might be retained.

If the machines are permitted to make all their own decisions, we can't make any conjectures as to the results, because it is impossible to guess how such machines might behave. We only point out that the fate of the human race would be at the mercy of the machines. It might be argued that the human race would never be foolish enough to hand over all the power to the machines. But, we are suggesting neither that the human race would voluntarily turn power over to the machines nor that the machines would willfully seize power. What we do suggest is that the human race might easily permit itself to drift into a position of such dependence on the machines that it would have no practical choice but to accept all of the machines' decisions. As society and the problems that face it become more and more complex and machines become more and more intelligent, people will let machines make more of their decisions

for them, simply because machine-made decisions will bring better results than man-made ones. Eventually a stage may be reached at which the decisions necessary to keep the system running will be so complex that human beings will be incapable of making them intelligently. At that stage the machines will be in effective control. People won't be able to just turn the machines off, because they will be so dependent on them that turning them off would amount to suicide.

On the other hand, it is possible that human control over the machines may be retained. In that case, the average man may have control over certain private machines of his own, such as his car or his personal computer, but control over large systems of machines will be in the hands of a tiny elite – just as it is today, but with two differences. Due to improved techniques, the elite will have greater control over the masses; and because human work will no longer be necessary, the masses will be superfluous, a useless burden on the system. If the elite are ruthless, they may simply decide to exterminate the mass of humanity. If they are humane, they may use propaganda or other psychological or biological techniques to reduce the birth rate until the mass of humanity becomes extinct, leaving the world to the elite. Or, if the elite consist of soft-hearted liberals, they may decide to play the role of good shepherds to the rest of the human race. They will see to it that everyone's physical needs are satisfied, that all children are raised under psychologically hygienic conditions, that everyone has a wholesome hobby to keep him busy, and that anyone who may become dissatisfied undergoes "treatment" to cure his "problem." Of course, life will be so purposeless that people will have to be biologically or psychologically engineered either to remove their need for the power process or make them "sublimate" their drive for power into some harmless hobby. These engineered human beings may be happy in such a society, but they will most certainly not be free. They will have been reduced to the status of domestic animals.

And, now here is the shocker, in Joy's words:

In the book, you don't discover until you turn the page that the author of this passage is Theodore Kaczynski – the Unabomber. ...Kaczynski's actions were murderous and, in my view, criminally insane. He is clearly a Luddite, but simply saying this does not dismiss his argument; as difficult as it is for me to acknowledge, I saw some merit in the reasoning in this single passage. I felt compelled to confront it.

Kaczynski's dystopian vision describes unintended consequences, a well-known problem with the design and use of technology, and one that is clearly related to Murphy's Law – "Anything that can go wrong, will." ...The cause of many such surprises seems clear: The systems involved are complex, involving interaction among and feedback between

many parts. Any changes to such a system will cascade in ways that are difficult to predict; this is especially true when human actions are involved.

I started showing friends the Kaczynski quote from *The Age of Spiritual Machines*; I would hand them Kurzweil's book, let them read the quote, and then watch their reaction as they discovered who had written it. At around the same time, I found Hans Moravec's book, *Robot: Mere Machine to Transcendent Mind*. Moravec is one of the leaders in robotics research, and was a founder of the world's largest robotics research program at Carnegie Mellon University. *Robot* gave me more material to try out on my friends – material surprisingly supportive of Kaczynski's argument.

According to Moravec,

...our main job in the 21st century will be “ensuring continued cooperation from the robot industries” by passing laws decreeing that they be “nice,” and to describe how seriously dangerous a human can be “once transformed into an unbounded superintelligent robot.” Moravec's view is that the robots will eventually succeed us – that humans clearly face extinction.

Joy wonders why more people do not share his concern and unease and suggests an answer:

...Accustomed to living with almost routine scientific breakthroughs, we have yet to come to terms with the fact that the most compelling 21st-century technologies – robotics, genetic engineering, and nanotechnology – pose a different threat than the technologies that have come before. Specifically, robots, engineered organisms, and nanobots share a dangerous amplifying factor: they can self-replicate. A bomb is blown up only once – but one bot can become many, and quickly get out of control.

Much of my work over the past 25 years has been on computer networking, where the sending and receiving of messages creates the opportunity for out-of-control replication. But while replication in a computer or a computer network can be a nuisance, at worst it disables a machine or takes down a network or network service. Uncontrolled self-replication in these newer technologies runs a much greater risk: a risk of substantial damage in the physical world.

Each of these technologies also offers untold promise: the vision of near immortality that Kurzweil sees in his robot dreams drives us forward; genetic engineering may soon provide treatments, if not outright cures, for most diseases; and nanotechnology and nanomedicine can address yet more ills. Together they could significantly extend our average life span

and improve the quality of our lives. Yet, with each of these technologies, a sequence of small, individually sensible advances leads to an accumulation of great power and, concomitantly, great danger.

Joy summarizes what he sees as the clear and present danger that confronts us:

The 21st-century technologies – genetics, nanotechnology, and robotics (GNR) – are so powerful that they can spawn whole new classes of accidents and abuses. Most dangerously, for the first time, these accidents and abuses are widely within the reach of individuals or small groups. They will not require large facilities or rare raw materials. Knowledge alone will enable the use of them.

Thus we have the possibility not just of weapons of mass destruction but of knowledge-enabled evil whose possibility spreads well beyond that which weapons of mass destruction bequeathed to the nation-states, on to a surprising and terrible empowerment of extreme individuals.

That is a sobering conclusion from a very responsible and well-informed scientist who has made his mark as one of the chief architects of the present state of cybertechnology. And he declares, “...I trust it is clear that I am not a Luddite.”

Rather, he affirms a strong belief in the value of the scientific search for truth and the ability of great engineering to bring material progress. Why is he surprised to find himself in his present state of unease and foreboding? Because, he writes,

Perhaps it is always hard to see the bigger impact while you are in the vortex of a change. Failing to understand the consequences of our inventions while we are in the rapture of discovery and innovation seems to be a common fault of scientists and technologists; we have long been driven by the overarching desire to know that is the nature of science’s quest, not stopping to notice that the progress to newer and more powerful technologies can take on a life of its own.

This is what he sees developing before our eyes:

As this enormous computing power is combined with the manipulative advances of the physical sciences and the new, deep understandings in genetics, enormous transformative power is being unleashed. These combinations open up the opportunity to completely redesign the world, for better or worse: The replicating and evolving processes that have been confined to the natural world are about to become realms of human endeavor.

In designing software and microprocessors, I have never had the feeling that I was designing an intelligent machine. The software and hardware is

so fragile and the capabilities of the machine to “think” so clearly absent that, even as a possibility, this has always seemed very far in the future.

But now, with the prospect of human-level computing power in about 30 years, a new idea suggests itself: that I may be working to create tools which will enable the construction of the technology that may replace our species. How do I feel about this? Very uncomfortable. Having struggled my entire career to build reliable software systems, it seems to me more than likely that this future will not work out as well as some people may imagine. My personal experience suggests we tend to overestimate our design abilities.

Given the incredible power of these new technologies, shouldn't we be asking how we can best coexist with them? And if our own extinction is a likely, or even possible, outcome of our technological development, shouldn't we proceed with great caution?

There is much more in Joy's essay, but what I have lifted up is surely enough to answer his question in the affirmative. Let me be clear – in all of this discussion of the accelerating pace of technological breakthroughs, I am over my head; nanotechnology is beyond my capacity to conceive. When I read of molecular level “assemblers” and that “one kind of nanomachine is the assembler, which is a tiny factory that can manufacture other machines, including replicas of itself,” I confess I am in a deep fog. But, I can at least catch some sense of the frontiers on which research and development is being executed. What it means that there will be robotic humans or human robots, I can hardly imagine, but I am now aware that this is no longer the stuff of science fiction; this is where we have arrived and where the next two or three decades will bring us if we survive – an open question!

Joy puts it this way:

The nuclear, biological, and chemical (NBC) technologies used in 20th-century weapons of mass destruction were and are largely military, developed in government laboratories. In sharp contrast, the 21st-century genetic, nanotech, robotic technologies have clear commercial uses and are being developed almost exclusively by corporate enterprises. In this age of triumphant commercialism, technology – with science as its handmaiden – is delivering a series of almost magical inventions that are the most phenomenally lucrative ever seen. We are aggressively pursuing the promises of these new technologies within the now-unchallenged system of global capitalism and its manifold financial incentives and competitive pressures.

This is the first moment in the history of our planet when any species, by its own voluntary actions, has become a danger to itself – as well as to vast numbers of others.

And then he continues:

It might be a familiar progression, transpiring on many worlds – a planet, newly formed, placidly revolves around its star; life slowly forms; a kaleidoscopic procession of creatures evolves; intelligence emerges which, at least up to a point, confers enormous survival value; and then technology is invented. It dawns on them that there are such things as laws of Nature, that these laws can be revealed by experiment, and that knowledge of these laws can be made both to save and to take lives, both on unprecedented scales. Science, they recognize, grants immense powers. In a flash, they create world-altering contrivances. Some planetary civilizations see their way through, place limits on what may and what must not be done, and safely pass through the time of perils. Others, not so lucky or so prudent, perish.

That is Carl Sagan, writing in 1994, in *Pale Blue Dot*, a book describing his vision of the human future in space. I am only now realizing how deep his insight was, and how sorely I miss, and will miss, his voice. For all its eloquence, Sagan's contribution was not least that of simple common sense – an attribute that, along with humility, many of the leading advocates of the 21st-century technologies seem to lack.

Well, there you have it – one person of genius celebrating our near approach to an heavenly existence, the other of equal stature predicting the damnation of hell. Which will it be? And is there no third way? Garreau answers in the affirmative – a Third Scenario.

Prevail

Garreau introduces us to a fascinating human being named Jaron Zepel Lanier, “one of the world's more startling combinations of philosopher, creative artist and computer scientist” – a remarkable combination of gifts and interests, described thus:

He is best known, however, for inventing “virtual reality” as a shared experience, and naming it. In his early 20's Lanier founded VPL Research – yes, in a garage in California. It was the first company to provide research labs around the world with the then-almost-magical virtual-reality paraphernalia. When he was 24, his groundbreaking work made the cover of *Scientific American*. Few recent innovations have had such consequences. It is difficult to buy an automobile or fly in an airplane today that wasn't designed in virtual reality. The petroleum to fuel them

was probably found with Lanier's inventions. City planning, building design, surgery and scientific visualization – especially of molecules important to the creation of new drugs and the understanding of proteins and genes – are being redefined by virtual-reality imaging. So is the training of police, firefighters, emergency response teams and the military.

In the early 21st-century, Lanier was the chief scientist of Advanced Network and Services, the engineering office of Internet2 – a coalition of 180 American research universities sharing an experimental next-generation network so powerful that when they fired it up, lights dimmed all over campus, or so the story goes. He led the National Tele-Immersion Initiative. It aimed to create alternative worlds in which people at distant sites work together in a shared, simulated environment that makes them feel as if they were in the same world.

“Our social contract with our own tools has brought us to a point where we have to decide fairly soon what it is we humans ought to become because we are on the brink of having the power of creating any experience we desire,” writes Howard Rheingold, an analyst of technology's impact on society. Virtual reality “represents a kind of new contract between human and computers, an arrangement that could grant us great power, and perhaps change us irrevocably in the process.” (p. 191f)

Lanier claims, “The degree to which I was a social failure is impossible to even state...It was just extreme beyond...” He had no friends in a hostile environment. Such an early life experience, Lanier points to as putting him on the track to The Prevail Scenario. Garreau compares Kurzweil, Joy and Lanier:

When faced by the prospect of a sudden transformation of human nature, Ray Kurzweil, Bill Joy and Jaron Lanier each responds from the deep recesses of his soul. Kurzweil worships the power of ideas to resolve all problems; Joy in his lonely fashion engages death; Lanier attributes all his subsequent work to finding “the connection I lost.”

The thinking of Kurzweil, Joy and Lanier describes a triangle. Lanier's is not some middle vision between that of Kurzweil and Joy. He is off in an entirely other territory that pokes and prods their technological determinism. Lanier agrees with Kurzweil that it is not tremendously likely that you can stop radical evolution by willing it gone. He agrees with Joy that The Curve could lead to mortal dangers. Yet Lanier would not relinquish transcendence even were that possible. Indeed, he views the prospect of exploring all the ways humans could expand their connections as the greatest adventure on which the species has ever embarked. Lanier's critical difference is that he does not see The Curve

yielding some inevitable, preordained result, as in the fashion of the Heaven and Hell Scenarios. “If it turns out Bill or Ray are right, I’ll be disappointed mostly because it’s such a profoundly dull and unheroic outcome,” he says. “It’s such a gizmo outcome. There is no depth to it at all.”

Lanier believes it is well within the power of the species to transcend to something far beyond the current understanding of human nature. He just views as sterile the prospect of uploading some portion of our brains into computers. Instead, he pictures a rich and tasty brew of opportunities. He can see a vast array of transcendences. He imagines humans making intelligent decisions, exercising creative control. If you were graphing Lanier’s idea, it would not be represented by smooth curves, either up or down, as in the first two scenarios. It would doubtless have fits and starts, hiccups and coughs, reverses and loops – not unlike the history we humans always have known. It would be messy and chaotic, like humans themselves. Technology would not be in control. It would not be on rails, inexorably deciding human affairs. At the same time, the outcome would definitely involve radical change.

I call visions like this The Prevail Scenario.

Uncertainty suffuses The Prevail Scenario. For Lanier, that’s not a bug. It’s a feature. “The universe doesn’t provide us a way to have absolute truth,” he says. “I am not fanatical about my ideas. I’m perfectly happy to see where there are holes in them. This idea is something I believe – in the sense that I act on it. But let me tell you the trap I want to avoid falling into.” He judges Kurzweil and Joy to be “severe exaggerators and overstaters. Their reasoning is similar to that of a paranoid person in that they find only the little bits that fit into their worldview and build this cage in which they imprison themselves. I’m not willing to be a fanatic and demand that people see that every bit of data supports my view. I want to be given the latitude to present my own thing more softly. I actually perceive it with less of a sense of certainty and bullheadedness. It’s just my best guess.”

His key point about The Prevail Scenario: “I will argue for perceiving a gradual ramp of increased bridging of the interpersonal gap. I believe that that’s demonstrable. I do not perceive it as being an exponential increase. I do not perceive it as something where there is an economy of scale and it’s compounding itself and it’s heading towards some asymptotic point. I am not saying it’s accelerating.” The Prevail Scenario, he’s saying, is measured by its impact on human society. He is specifically arguing that even if technology is on a curve, its impact is not. This is why he is skeptical about the idea of a Singularity – technology increasing so

quickly as to create an imminent and cataclysmic upheaval in human affairs.

In his version of The Prevail Scenario, Lanier is talking about transcendence through an “infinite game.” “The future that I’m trying to find is one where people are in the center and there’s this every-expanding game of connecting people that creates a game into the future.” (p. 195ff)

In *Finite and Infinite Games*, James Carse writes of the familiar contests of everyday life – played in business and politics, in the bedroom and the battlefield. Finite games have winners and losers, a beginning and an end and players try to control the game and set the bottom line in advance and are serious and determined about getting that outcome, fixing the future based on the past. But players of infinite games, by contrast “enjoy being surprised. Continuously running into something one didn’t know will ensure that the game will go on forever...A finite game is played for the purpose of winning, an infinite game for the purpose of continuing to play...Infinite players play *with* the rules. “Life, liberty, and the pursuit of happiness” is an infinite game, Lanier believes. Infinite games are the real transcendence games. They allow you to transcend your boundaries. They allow you to transcend who you are.” (p. 197)

Reading Lanier’s thoughts one cannot help but sense quite a different spirit and tone than we found in both the Heaven and Hell Scenarios.

Lanier is dismissive of what he describes as “the religion of the elite technologists,” from Moravec to Minsky, in the halls of “true believers” at Stanford, MIT and Carnegie Mellon. They believe in a key anticipated outcome of The Heaven Scenario: “That computers are becoming autonomous and a successor species.”

“My feeling about spiritual questions is that there is a tightrope that I try to stay on, not always successfully. If you fall to the right side, you become an excessive reductionist. You pretend to know more than you do and you become overly rational. If you fall to the left side, you become superstitious and you believe that there are magic tricks of meaning. Staying right on that line is where you’re a skeptic but also acknowledge the degree of mystery in our lives. If you can adhere to that, I think that’s where truth lies. Sometimes it’s lonely and frustrating. For a lot of these questions, I think ‘I don’t know’ is the most dignified and profound answer. A profound ‘I don’t know’ is the result of a lot of work.”

Lanier wants to stay open to the possibility that “the world we manipulate here isn’t all there is. The world accessible by technologies isn’t all there is. I don’t want to become a superstitious fool and believe I can say anything about this other world. That’s very important. I don’t want to

start saying, ‘Oh, there are these angels here.’ The idea of God as an entity that talks and stuff doesn’t quite fit for me. It’s also not something I’m gonna dismiss.” He makes a small joke by pretending to be the systems administrator of all creation: “We have limited privileges in this area.”

To describe his version of transcendence in a Prevail Scenario without falling off his tightrope, Lanier likes to talk about octopi. Actually, he also likes to talk about the psychology of early childhood, as well as the day that aliens visit the earth and perceive human nature for the first time. But these to him are all stories about the same thing – a steadily increasing ramp to transcendence that leads to deeper and better ways of bridging the interpersonal gap.

Lanier’s Prevail Scenario is the search for a complex, evolving, inventive transcendence. Because it is an infinite game, it never goes into a Singularity, as in the Heaven and Hell Scenarios. Because it’s fundamentally imaginative, it doesn’t have any such simple measurement. It just expands forever. Human connectedness is “a much more profound kind of ramp,” Lanier believes. “The thing about a Singularity hypothesis is that it’s profoundly uncreative.” (p. 199f)

There are unlimited Prevail Scenarios but Garreau claims Lanier’s is well articulated. They all, however, begin with these principles:

- Humans have an uncanny history of muddling through – of forging unlikely paths to improbable futures in defiance of historical forces that seem certain and inevitable;
- The wellspring of this muddling through, of this prevailing, is the ability of ordinary people facing overwhelming odds to rise to the occasion because it is the right thing – for example, the British “nation of shopkeepers” that defied the Third Reich.

To these, Garreau relates, Lanier adds one more proposition:

- Even if technology is advancing along an exponential curve, that doesn’t mean humans cannot creatively shape the impact on human nature and society in largely unpredictable ways.

Thus, Garreau concludes, Prevail is an odd combination of the marvelously ordinary and the utterly unprecedented. It is so common and so rare – so old and so new – that the history of the Prevail Scenario is less well defined than that of The Heaven or Hell Scenario. (p. 206). It is not predictable by use of human logic. Ironically, it is driven by faith “in human cussedness;” we can be counted on to throw The Curve a curve!

And one more proposition from Lanier regarding Prevail:

- The key measure of Prevail’s success is an increasing intensity of links between humans, not transistors. If some sort of transcendence is achieved beyond today’s

understanding of human nature, it will not be through some individual becoming superman. In Lanier's Prevail Scenario, transcendence is social, not solitary. The measure is the extent to which many transform together. (p. 210)

Lanier measures the idea of progress by technological and economic advance – fire, the wheel, the steam engine. There is a second ramp – moral improvement. But neither of these is sufficient; for Lanier the third ramp is the increased connection between people. That is the real measure of the idea of progress.

The third ramp, historically, starts with the invention of language and then moves to writing, drama, literature, printing, film, the telephone, radio, television, the Internet and so forth. "What you are measuring is an increase in the quantity, quality, variety and complexity of the ways humans can connect with each other. Not ways in which they become identical, but ways that they become closer. (p. 214)

Garreau concludes his *Radical Evolution* with a chapter entitled "Transcend," which he begins by recounting his experience at a conference called "The Adaptable Human Body: Transhumanism and Bioethics in the 21st Century" co-sponsored by the Yale Interdisciplinary Bioethics Program Working Research Group on Technology and Ethics and a young organization called The World Transhumanist Association. Transhumanists are focused on the enhancement of human intellectual, physical and emotional capabilities, the elimination of disease and unnecessary suffering, and the dramatic extension of lifespan (p. 231). Transhumanists believe it naïve to think the human condition and human nature will remain pretty much the same for much longer. They believe rather that the GRIN technologies are fundamentally changing the rules of the game. The transcend proposition rests on three premises:

- The undeniable competitive advantages that the genetic, robotic, information and nano technologies convey on those who embrace them for economic, medical, educational, military, or artistic reasons suggest that these methods will continue to advance at an ever-increasing rate.
- So many of these technologies – "designer babies," augmented cognition, metabolic makeovers, anti-aging medicine and all the rest – can alter basics of the human condition. If they can modify our minds, memories, metabolisms, progeny and personalities, it seems reasonable to think that these procedures might well have an impact on what it means to be human.
- The history of technologies as disruptive as these suggests that there will be unintended consequences. We will be surprised by many of the outcomes.

If you accept these three propositions as reasonable bets, what you're looking at is that rare bird, the high probability, high-impact scenario. Transcend builds on, expands and gives measure to The Prevail Scenario, in which technology does not control us, but we control technology. (p. 233f)

As he draws together the lines of the three scenarios with his discussion of transcendence, Garreau states that “the central argument about the future of human nature is whether it is fixed and immutable, once and forever, or whether it can continue to evolve.” (p. 235) A number of scholars from a variety of disciplines are heard from. Garreau has succeeded in presenting the respective scenarios honestly and without prejudice. His own leaning, however, would seem to be toward The Prevail Scenario and his final chapter reflects the manner of the Transcendence he affirms and the spiritual dimension such transcendence calls for. Coming down on the side of a continuing evolution, he recognizes the necessity of an evolving spirituality to guide that evolution in a positive, life-affirming direction. He writes, “Perhaps it is with our devotions that we can start choosing to steer. Right now the stories we tell do not match the facts.” (p.264)

He recognizes as the most influential thinker of the twentieth century, seeking to unify the truths of science and religion, the French Jesuit scientist, Pierre Teilhard de Chardin. In his magnum opus, *The Phenomenon of Man*, 1940, he argued that someday our technology would allow us to create a web of thought and action that would make the world more complex, diverse and alive, moving humankind toward an ultimate evolution – the Omega Point. He envisioned the earth as a single living organism, with all the elements of it – from the people to the birds connected like cells in a body. The goal of evolution, he suggested, is to link up individual human minds, bringing an explosion of intelligence and even global consciousness to the whole of Being. With the rise of the World Wide Web, we can see hints that he may have been right.

Although Garreau does not pursue Teilhard any further, it is interesting that this amazing prophetic voice recognized the imperative of spiritual transformation in light of exploding technological breakthroughs and especially in light of the explosion of the atomic bomb whose anniversary we mark today. Teilhard believed so strongly, both as a religious thinker and as a scientist in the evolutionary process and the ongoing forward movement toward the Omega Point as he called it – a process not pushed from behind but pulled from the future, that he was not critical of the development of research on the splitting of the atom. He quoted *The New Yorker*, August 18, 1945, in the wake of the dropping of the bombs on Hiroshima and Nagasaki – “Political plans for the new world, as shaped by statesmen, are not fantastic enough. The only conceivable way to catch up with atomic energy is with political energy directed to a universal structure” – *The Future of Man*, p. 146. This citation appeared in an essay entitled, “Some Reflections on the Spiritual Repercussions of the Atom Bomb.” He was aware of the devastating potential of the splitting of the atom but was so

convinced of the forward progress of the Evolutionary Process which he understood in total cosmic breadth, that he foresaw the event as leading not only to a massive leap forward in scientific and technological mastery but to spiritual growth as well. The following citations will indicate his confidence.

Thus the greatest of Man's scientific triumphs happens also to be the one in which the largest number of brains were enabled to join together in a single organism, at the same time more complex and more centred, for the purpose of research. Was this simply coincidence? Did it not rather show that in this as in other fields nothing in the universe can resist the converging energies of a sufficient number of minds sufficiently grouped and organized?

Thus considered, the fact of the release of nuclear energy, overwhelming and intoxicating though it was, began to seem less tremendous. Was it not simply the first act, even a mere prelude, in a series of fantastic events which, having afforded us access to the heart of the atom, would lead us on to overthrow, one by one, the many other strongholds which science is already besieging? The vitalisation of matter by the creation of super-molecules. The re-modelling of the human organism by means of hormones. Control of heredity and sex by the manipulation of genes and chromosomes. The readjustment and internal liberation of our souls by direct action upon springs gradually brought to light by psycho-analysis. The arousing and harnessing of the unfathomable intellectual and effective powers still latent in the human mass....Is not every kind of effect produced by a suitable arrangement of matter? And have we not reason to hope that in the end we shall be able to arrange every kind of matter, following the results we have obtained in the nuclear field? (p. 149)

....But now, after that famous sunrise in Arizona, he can no longer doubt. He not only can but, of organic necessity, he *must* for the future assist in his own genesis. The first phase was the creation of mind through the obscure, instinctive play of vital forces. The second phase is the rebounding and acceleration of mind itself, the only principle in the world capable of combining and using for the purpose of Life, *and on the planetary scale*, the still-dispersed or slumbering energies of matter and of thought. It is broadly in these terms that we are obliged henceforth to envisage the grand scheme of things of which, by the fact of our existence, we find ourselves a part. (p. 150)

...To me it seems that thanks to the atom bomb it is war, not mankind, that is destined to be eliminated, and for two reasons. The first, which we all know and long for, is that the very excess of destructive power placed in our hands must render all armed conflict impossible. But what is even more important, although we have thought less about it, is that war will be eliminated at its source in our hearts because, compared with the vast field

for conquest which science has disclosed to us, its triumphs will soon appear trivial and outmoded. Now that a true objective is offered us, one that we can only attain by striving with all our power in a concerted effort, our future action can only be convergent, drawing us together in an atmosphere of sympathy. I repeat, sympathy, because to be ardently intent upon a common object is inevitably the beginning of love. In affording us a biological, 'phyletic' outlet directed upwards, the shock which threatened to destroy us will have the effect of giving us a sense of direction and a dynamic force and finally (within certain limits) of making us of one mind. The atomic age is not the age of destruction but of union in research. For all their military trappings, the recent explosions at Bikini herald the birth into the world of a Mankind both inwardly and outwardly pacified. They proclaim the coming of the *Spirit of the Earth*.... (p. 152)

In short, the final effect of the light cast by the atomic fire into the spiritual depths of the earth is to illumine within them the overriding question of the ultimate end of Evolution – that is to say, the problem of God. (p. 153)

The great scientist, humanist Albert Einstein, was not as sanguine about the atomic breakthrough. Teilhard, so convinced of evolutionary progress, recognized the need for a supra-national governing authority to control the atomic breakthrough, but that was not what was his over-riding concern. For Einstein it was. In his 700-page volume, *Einstein On Peace*, (including notes and index) one could cite his grave concern on almost any page. While Einstein's passion for supra-sovereign authority and the end of war is not the subject of this address, in light of yet another anniversary of the dropping of the bomb, I quote Einstein in this context.

Before the raid on Hiroshima, leading physicists urged the War Department not to use the bomb against defenseless women and children. The war could have been won without it. The decision was made in consideration of possible future loss of American lives; but now we have to consider the possible loss, in future atomic bombings, of *millions of lives*. The American decision may have been a fatal error, for men accustom themselves to thinking that a weapon which was used once can be used again.

Had we allowed other nations to witness the text explosion at Alamogordo, New Mexico, the bomb would have served as an education for new ideas. This would have been an impressive and favorable moment to make considered proposals for world order to end war. Our renunciation of this weapon as too terrible to use would have carried great weight in negotiations and would have convinced the other nations of our sincerity in asking for their co-operation in developing these newly unleashed powers for good and peaceful purposes. (p. 386)

In an interview with newscaster Robert Trout, CBS, May 28, 1946, Einstein was asked, “And you believe, Dr. Einstein, that this thinking man can solve our great problem for us?” Einstein gave a lengthy answer which began, “I believe nothing else can.” Further along in the interview, prompted by Archibald MacLeish, Einstein said, “Just as we have changed our thinking in the world of pure science to embrace newer and more useful concepts, so we must now change our thinking in the world of politics and law. It is too late to make mistakes.” (p. 378f)

Garreau brings his discussion of transcendence to a close on a religious note.

Humans find an absence of explanations for how the world works profoundly unsettling. That’s why the search for this new grand story becomes important. Yet when you start talking to professionals who are thinking about what this narrative might be like, you find it to be an almost entirely secular group – the subject of God rarely comes up. I am not particularly religious myself, but the American people overwhelmingly are. So it occurred to me to wonder what transcendence might have meant historically to the worldwide range of the devout. You’d think over the last three thousand years or so, we might find a few hints in their work as to how to think about this fix. (p. 257)

Garreau points to Karen Armstrong and her reference to Karl Jaspers, the German philosopher of history, who spoke of the Axial Age – “a period of unique and fundamental focus on transcendence that is “the beginning of humanity as we now know it.”

All over the world, humans simultaneously began to wake up to a burning need to grapple with deep and cosmic questions. All the major religious beliefs are rooted in this period. “The search for spiritual breakthrough was no less intense and urgent than the pursuit of technological advance is in our own,” she says. “That’s quite endorsing, actually. Instead of seeing your own tradition as an idiosyncratic, lonely quest, it becomes part of what human beings do, part of a universal search for meaning and value. This is the kind of scenario that the human mind goes through in its search for ultimate meaning.”

“If there is an axis in history, we must find it empirically,” Jaspers wrote.

The spiritual process which took place between 800 and 200 B.C. seems to constitute such an axis. It was then that the man with whom we live today came into being. Let us designate this period as the “axial age”.

Extraordinary events are crowded into this period. In China lived Confucius and Lao Tse, all the trends in Chinese philosophy arose, it was the era of Mo Tse, Chuang Tse and countless others. In India it was the age of the upanishads and of Buddha; as in China, all philosophical trends, including skepticism and materialism, sophistry and nihilism, were

developed. In Iran Zarathustra put forward his challenging conception of the cosmic process as a struggle between good and evil; in Palestine prophets arose: Elijah, Isaiah, Jeremiah, Deutero-Isaiah; Greece produced Homer, the philosophers Parmenides, Heraclitus, Plato, the tragic poets, Thucydides, Archimedes. All the vast development of which these names are a mere intimation took place in these few centuries, independently and almost simultaneously in China, India and the West.

The new element in this age is that man everywhere became aware of being as a whole, of himself and his limits. He experienced the horror of the world and his own helplessness. He raised radical questions, approached the abyss in his drive for liberation and redemption. And in consciously apprehending his limits he set himself the highest aims. He experienced the absolute in the depth of selfhood and in the clarity of transcendence.

Armstrong is fascinated by the human universals operating amid the tumultuous upheaval of that cultural revolution. What caused dispersed civilizations simultaneously to develop these broad, transcendent ideas? There is no human culture that does not incorporate some notion of religion. Even nonbelievers develop systems such as Marxism that sport all the trappings of religion. This evidence causes Armstrong to believe that religion is an essential human need, as unlikely to be outgrown as our need for art. She sees religion as a universal search for meaning and values. She believes it is hardwired.

“Human beings cannot endure emptiness and desolation,” Armstrong writes. “They will fill the vacuum by creating a new focus of meaning.” Think of the constellations in the night sky. Humans eagerly connect dots and come up with the most elaborate – even poetic tales, adorning them with heroes and myths, rather than tolerate randomness. The desire to believe goes way back in evolutionary history...” (p. 258f)

Garreau suggests that this may give us a clue about human nature.

Maybe this tells us something about human nature. That we are pattern-seeking, storytelling animals. If one sees belief as reflecting a hardwired need for meaning and values, then perhaps in the Axial Age we filled the emptiness of our emerging consciousness with the highest aspirations for human nature we could possibly imagine.

This raises the interesting question of whether we are due for a new Axial Age. If our narratives of how the world works are not matching the facts, are we seeking a new era of sense, intelligibility, clarity, continuity and unity? If profound restatements of how the world works arose all over the planet the last time we had a transition on the scale of that from biological

evolution to cultural evolution, will it happen again as we move from cultural to technological evolution? (p. 259f)

Garreau quotes Betty Sue Flowers who was the editor of *The Power of Myth*, the book by Joseph Campbell with Bill Moyers that accompanied the acclaimed PBS series by the same name. Flowers affirms, “This is a spiritual crisis. It’s not about science.” He references Martin E.P. Seligman who points out that there are three levels of human existence – the pleasant life, the good life, and the meaningful life.

The third form of happiness that is inevitably sought by humans is the pursuit of a meaningful life. “There is one thing we know about meaning,” says Seligman, “that meaning consists in attachment to something bigger than you are. The larger the thing that you can credibly attach yourself to, the more meaning you get out of life. Aristotle said the two noblest professions are teaching and politics, and I believe that as well. Raising children, and projecting a positive human future through your children, is a meaningful form of life. Saving the whales is a meaningful form of life. Fighting in Iraq is a meaningful form of life. Being an Arab terrorist is a meaningful form of life. Notice this isn’t a distinction between good and evil. That’s not part of this. This isn’t a theory of everything. This is a theory of meaning, and the theory says, joining and serving in things larger than you that you believe in while using your highest strengths is a recipe for meaning...

It’s impossible that there will be a drug for meaning, Seligman says. But if meaning suggests deploying your greatest strengths in the service of something you believe is larger than you – pursuing the infinite game – that would seem to go to the heart of the measure of The Prevail Scenario: increased human connections. (p. 261f)

Garreau references Karen Armstrong again pointing to what is a dominant theme in her work – compassion.

“Religion isn’t about believing things,” Armstrong says. “It’s ethical alchemy. It’s about behaving in a way that changes you, that gives you intimations of holiness and sacredness. It doesn’t really matter what you believe as long as it leads you to practical compassion. If your belief in a traditional God makes you come out imbued with a desire to feel with your fellow human beings, to make a place for them in your heart, to work to end suffering in the world, then it’s good.”

Introducing compassion into the equation is at the core of meaning. “Without more kindness in the world, technological power would mainly serve to increase man’s capacity to inflict harm on one another,” Bertrand Russell once wrote. Compassion may thus be at the core of successfully

managing transcendence – of coming up with a practical way to Prevail over the blind forces of change. (p. 262)

In this context, Garreau reaches back to Kurzweil, the champion of The Heaven Scenario along with one more reference to Teilhard:

“Evolution moves toward greater complexity, greater elegance, greater knowledge, greater intelligence, greater beauty, greater creativity, and more of other abstract and subtle attributes, such as love,” observes Ray Kurzweil. “And God has been called all these things, only without any limitation: infinite knowledge, infinite intelligence, infinite beauty and so on. Of course, even the accelerating growth of evolution never achieves an infinite level, but as it explodes exponentially it moves rapidly in that direction. So evolution moves inexorably toward our conception of God, albeit never quite reaching this ideal. Thus the freeing of our thinking from the severe limitations of its biological form may be regarded as an essential spiritual quest.”

“Someday after mastering winds, waves, tides and gravity, we shall harness the energies of love,” writes Pierre Teilhard de Chardin. “And then, for the second time in the history of the world, man will discover fire.” (p. 262)

Garreau concludes by suggesting that perhaps we should create new rituals – maybe “a liturgy of life everlasting as a person receives her first cellular age-reversing workup.”

Will these rituals do any good?

I don't know. Do baptisms, marriages and funerals – sanctifying birth, copulation and death do any good? My experience says yes. At the very least they are celebrations of transformation where people cross barriers – barriers of class, gender, region, race and religion. They bring us together by officially marking and embracing critical moments. On these occasions, human connections that are rarely achieved elsewhere routinely occur.

If we are embarking on a path in which we stand to transform ourselves more than at any brief period in our species' time on earth, we are creating new critical moments. Perhaps we might start formally marking the occasions.

If we did, inviting those we know from all walks of life and all levels of ability to these ceremonies, it would continue to knit together the fabrics of all the different kinds of human natures to come.

It would be about creating the third happiness, the happiness of being part of something much larger than us.

It would be about continuing to march up the ramp of human connectedness.

That, after all, might just possibly be the ultimate transcendence. (p. 265)

As I set forth the current human situation regarding the radical evolution we are experiencing, I think of it in terms of the biblical story. Garreau suggests quite rightly that the story we tell does not fit the facts. However, as the philosopher, Santayana, counseled, guard the story because it takes 2000 years to create a new one. And maybe the story still speaks if we can move beyond the ancient mythic form in which it comes, taken literally, and ask what questions those ancient writers were addressing.

Take, for example, the story of the first temptation in the Garden of Eden recorded in Genesis 3:

The First Sin and Its Punishment

Now the serpent was more crafty than any other wild animal that the Lord God had made. He said to the woman, "Did God say, 'You shall not eat from any tree in the garden'?"

The woman said to the serpent, "We may eat of the fruit of the trees in the garden; but God said, 'You shall not eat of the fruit of the tree that is in the middle of the garden, nor shall you touch it, or you shall die'."

But the serpent said to the woman, "You will not die; for God knows that when you eat of it your eyes will be opened, and you will be like God, knowing good and evil."

So when the woman saw that the tree was good for food, and that it was a delight to the eyes, and that the tree was to be desired to make one wise, she took of its fruit and ate; and she also gave some to her husband, who was with her, and he ate.

Then the eyes of both were opened, and they knew that they were naked; and they sewed fig leaves together and made loincloths for themselves.

Is this really about snakes and apples? Isn't it really about the potential and the limits of human knowledge? The biblical tradition in the Christian tradition speaks of this yielding to the temptation to seek knowledge as "The Fall". The great English poet, John Milton, however, spoke of "the paradox of The Fortunate Fall." Was not the ancient author perhaps expressing the very thing we have been occupied with – promise and peril of ever-expanding human knowing and taking under control the "building blocks" of Creation.

Or, think of Psalm 8:

Divine Majesty and Human Dignity

O Lord, our Sovereign,
how majestic is your name in all the earth!
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 honor.
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.

O Lord, our Sovereign,
how majestic is your name in all
the earth!

Thinking of the human being in the midst of the majestic wonder of the cosmos, the writer recognizes our smallness, yet the reality is that it is precisely the human who is contemplating the cosmic miracle, and then goes on to affirm that we are made “a little lower than God”! The older King James version has “a little lower than the angels” perhaps drawing back from any reference to God. Quite an amazing affirmation of the human over two millennia ago.

Finally, look to that final vision in the New Testament, The Revelation of Jesus Christ to John. It is a violent, bloody apocalyptic vision of the End. Yet it closes with a marvelous picture of The City of God – The New Jerusalem – coming down from God in Heaven, when tears will be wiped away and death will be no more.

The New Heaven and the New Earth

Then I saw a new heaven and a new earth; for the first heaven and the first earth had passed away, and the sea was no more. And I saw the holy city, the new Jerusalem, coming down out of heaven from God, prepared as a bride adorned for her husband. And I heard a loud voice from the throne saying,

See, the home of God is among mortals.
He will dwell with them as their God;
They will be his peoples,
and God himself will be with them;
He will wipe every tear from their eyes.
Death will be no more;
Mourning and crying and pain will be no more,
for the first things have passed away.”

And, finally, in the final chapter, the moving vision of The City.

The River of Life

Then the angel showed me the river of the water of life, bright as crystal, flowing from the throne of God and of the Lamb through the middle of the street of the city. On either side of the river is the tree of life with its twelve kinds of fruit, producing its fruit each month; and the leaves of the tree are for the healing of the nations. Nothing accursed will be found there any more. But the throne of God and of the Lamb will be in it, and his servants will worship him; they will see his face, and his name will be on their foreheads. And there will be no more night; they need no light of lamp or sun, for the Lord God will be their light, and they will reign forever and ever.

From the Garden of Edenic bliss, through slings and arrows of human history to the City of God. That's The Story. Maybe there is more there than meets the eye. Perhaps if we react to it with new eyes, it still fits the facts or gives room for them.

References:

Joel Garreau, *Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies -- and What It Means to Be Human*. New York: Doubleday, 2005.