New Book Excerpts

Foresight and Extreme Creativity: Strategy for the 21st Century

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Change is accelerating everywhere, and today's leaders are facing challenges unlike any they've ever seen. New technologies are radically altering the market, climate change is threatening to disrupt everything, and political clashes, violent conflict, and terrorism are becoming common. ***Foresight & Extreme Creativity*** is a comprehensive and invaluable guide to business, management, and life in the ever-changing and increasingly complex world of the 21st century. Renowned author, speaker, and consultant Langdon Morris provides a detailed explanation of the powerful forces that are shaping today's world, and which will impact upon us all for decades to come.

This book includes a detailed study of the future of technology, the possibilities for climate change and its impact on the global energy industry, the future of the population explosion and tomorrow's cities, geopolitics in all of the world's hot spots, and the social and cultural dimensions of change.

Already hailed in early reviews as a clear-sighted, provocative, and important guide to our future, ***Foresight & Extreme Creativity*** is the must-read book for those who require a better understanding of the inevitable and potentially overwhelming changes in the world around us as we prepare for what's to come. Here are excerpts: *The super predator and The Experimenter.*

The Super Predator

Biologists now classify humanity as a "super-predator." This is a new category that they had to invent specifically to describe us. We merit this change to the lexicon of species classifications because no other creature in Earth's history has proven to be so ruthlessly efficient at wiping out both its competitors and its prey. Going back millions of years, no living thing whether plant, insect, bacterium, virus, or animal has successfully matched wits or weapons with humanity.[i]

We are not entirely immune from competition, however, but it's more than a little ironic that humanity's most dangerous competitor is … humanity. We engage in competition with ourselves relentlessly and on many levels, through open warfare on the battlefield and in silent conflicts in family life, in politics and economics, in education and sports and employment. No aspect of our lives is free of competition, and as we are indeed a supremely competitive species, we thus present to humanity its greatest danger: us.

With an assortment of powerful technologies that could be applied to achieve our self destruction in a grindingly slow and painful collapse over a span of decades, or through an abundance of extremely destructive capabilities that could annihilate civilization in just a few hours or maybe a few days, our own creativity certainly could be the cause of our own fatal demise. But will we? Or will we find the will and the wisdom to endure, or even to thrive? These are the themes that we explore in this book.

The Race

The 20th century was probably the most violent in human history. Approximately 200 million people perished in organized, mass violence during World Wars I and II and the countless additional regional conflicts, along with genocides and fratricides, politically-induced famines, and overall a general proclivity to kill one another. And while we live every day with the horrible prospect of nuclear annihilation, even at the smaller scale of contemporary day to day violence humans continue to kill ourselves and one another at the prodigious rate of about a million a year in war, crime, suicide, and accidents; another 2 million die in auto accidents. This breaks down to about 8,200 fatalities per day, giving further confirmation for the proposition that while we are the super-predator that is most threatening to every other living creature on

the Earth, we are also a species endangered most of all by ourselves.

In spite of all this violence, however, the greater dangers that our species faces may not be due to war, but due to commerce. In particular, with the advent of large scale climate change as a consequence of economic growth and development through the extraction and burning of fossil fuels, we have taken our competitive, destructive, and self-destructive behavior to a higher level of catastrophic potential. We have put Earth's entire ecosystem at risk.

Yet another type of danger is also emerging, but in a different way. Through the ongoing development of the commercial marketplace, society has achieved an accelerating rate of change, largely as a consequence of new technologies that are nudging us toward a world where change is occurring too fast for many to cope with. As a result, our inbuilt capacity to foresee, to manage, and to make prudent decisions is being overwhelmed by the reality of high speed technological change that evolution has never before encountered.

Hence, we are now in the midst of a race between a very fast changing culture, and a slower process of evolution. Will humans develop the insight and skill to endure before our evolution-provided instincts toward competition and short-sightedness lead us to kill ourselves off? This would make a great topic for a science fiction movie, except that it's not fiction, it's our lives. Significant questions preoccupy us:

- Will we comprehend and master the emerging patterns of massive, human-created change in time to make sound decisions that will assure our survival?
- Or will the onrushing flow of events continue to accelerate, and eventually overwhelm us?
- Stated another way, which capacity will prevail: Will our evolution-provided capacity to learn enable us to catch up with our evolution-provided capacity to create change? Or vice versa?

When we're able to answer these questions with more confidence than we have today, then we will most likely also know if we're going to survive, but in the mean time we live with the painful uncertainty of many things to worry about, unresolved questions and profound doubts.

Of course my purpose here is to explore the nature of these challenges and the changes that confront us, most of which are created by ourselves, and to understand the choices that we will have to make in the coming years. The problem, of course, is that, as Nate Silver reminds us, prediction is not our strong suit:

> We have a prediction problem. We love to predict things – and we aren't very good at it.[ii]

This is important, certainly, because we need to learn how to think productively about change and about the future, and about how to manage our organizations and institutions in the face of the many risks ahead, or the dangers underlying those risks will overwhelm us.

Indeed, the central nature of those risks is that we don't grasp what's coming at us very clearly, and so we don't prepare effectively. And while some few of us occasionally do get a decent glimpse of the future, it's often impossible for them to convince others of the impending dangers. And so the world changes faster, and uncertainty about the future increases, and with increasing uncertainty comes more and bigger risks.

In summary, then, the root of the problem is that *everything* is now changing, and it's generally changing too fast for us to grasp what it means. And while these changes are going on, we persist in our competitive and violent behaviors, and thus we remain the most fearsome predator the Earth has ever seen, far more dangerous than T. Rex or a great white shark ever was.

However, we are also a species with exceptional capacities. We are creative builders, foresighted visionaries, and thoughtful philosophers. We experiment and learn, create and strategize, plan and act, often with great skill. All of these marvelous qualities and personalities are merged in us along with others that are not so appealing, and the result is the dynamic flow of history, an abundance of ideas and concepts and realities that compose the great human experiment of the 21st century, the one in which we are now immersed.

As a result of our many skills and the tremendous impact they have had on the Earth, the geologists, like the biologists have also been obliged to come up with a new name for our era of geologic history.

They tell us that the Earth is more than 4.5 billion years old, and they identified the great epochs of Earth's development and invented the labels that every high school student knows. During the Jurassic Era the dinosaurs ruled the Earth, and during the much more recent Pleistocene Epoch the mammoths stalked the frozen tundra of the ice ages. After the Pleistocene came the Holocene, the name derived from Greek for "very recent," but it does not bring us to today. No, for that there's a name so new that the International Union of Geological Sciences has yet to formally adopt it. They suggest that we are living in the "Anthropocene," named of course for the massive impact of humanity on the Earth's geology, as the Earth's geology and biosphere are now being quite decisively shaped by human activities. It is we who damn the rivers, scrape the forests flat, create deserts, alter the weather, carve the tops off of mountains and shove them into the valleys. Now we're even creating earthquakes:

The risk of a damaging earthquake in the next year is as great in parts of north-central Oklahoma and southern Kansas, where oil and gas operations have set off man-made quakes for about five years, as it is in high-hazard parts of quake-prone California. Experts at the United States Geological Survey issued the warning as the agency released its annual map of earthquake risks, a document that included for the first time the prospects for human-caused quakes.[iii]

Since the last glaciation ended about 10,000 years ago, we have progressively developed the skills to alter our home planet,[iv] and while there isn't yet agreement on a precise start date, it's generally accepted that the Anthropocene begins with the era that economists refer to as industrialization, around 1800.[v]

But the global economy is already moving on from industrialism and we're entering yet another economic era, one so young and unformed that it as yet lacks a name. Will it be the Post-Industrial Era, or Digital Age, or the Knowledge Age, or perhaps the Age of Robots? Whatever name is finally agreed upon, in this new era it's possible that with improved insight and greater skill we may become the creators of an even of a much better and thriving world for our children and theirs. Describing where we're headed and how we might get there is also the purpose of this book.

Which means that this book is about you, and all your neighbors, and all of humanity, and about the exceptional creativity that we may harness and the uniquely human qualities that may enable us to attain the society that we aspire to. It explores who we are and who we are becoming, and the risks and opportunities that lie on the amazing journey before us.

The Experimenter

Every time humanity makes a new experiment we always learn more. We cannot learn less.

Buckminster Fuller[vi]

Humans are such effective predators because we are restless, relentless, and quite skilled experimenters. From the moment we take our first breath each of us is constantly learning by trying new things, and through this we are individually and collectively accumulating an abundant store of knowledge and capabilities. Psychologist Alison Gopnik describes us this way:

As a do-it-yourself exercise in developmental psychology, find any child between one and two, and simply watch her play with her toys for half an hour. Then count up the number of experiments you see – any child will put the most productive scientists to shame.[vii]

Because we are never satisfied with what we know and always wanting to know more, no sooner is one experiment completed than the next begins. Because "experimentation is a particularly powerful way of learning about causes, providing much more accurate results than observation alone,"[viii] curiosity that drives us to touch and try for ourselves, and the competition to do it better than others drive us forward, and we are never done, constantly striving to understand more and to do more.

In addition to our capacity to learn through experimentation, the other essential dimension of our

character is our ability to pass useful knowledge from one person to another through the medium of human culture, which makes us unique among all creatures on Earth. Engineer-anthropologist Joseph Henrich puts it this way:

The key to understanding how humans evolved and why we are so different from other animals is to recognize that we are a *cultural species*. We learn from one another in way that makes culture cumulative. Once these useful skills and practices began to accumulate and improve over generations, natural selection had to favor individuals who were better cultural learners. This interaction between culture and genes made us very different from other species – a new kind of animal. The striking technologies that characterize our species, from the kayaks and compound bows used by hunter-gatherers to the antibiotics and airplanes of the modern world, emerge not from singular geniuses but from the flow and recombination of ideas, practices, and lucky errors, and chance insights among interconnected minds and across generations. Culture makes us smart.[ix]

These two powerful capabilities, learning through experimentation and the accumulation of learning through culture, have enhanced our survival skills over the course of millions of years such that a relatively weak, relatively small, slow, and poor-sighted creature with average hearing is now the dominant species on Earth. Did evolution anticipate that we'd get so good at social learning that our accumulated knowledge would eventually threaten our own survival? Probably not, as evolution is a forward-moving, incremental process that itself layers one experiment upon the previous, but it is not as far as we know a foresighted one. So it would probably be incorrect to propose that evolution anticipates anything at all. But given our current situation, we humans must.

As individuals and a species, learning through experimentation and cultural sharing is both a compulsion and also an exceptional skill, and now it's a requirement. Thus, the inventor of the system by which we classify living creatures, Carl Linneas, might have more accurately named our own species *homo experimentor*, the one who experiments, rather than *homo sapiens*, the one who is wise. Indeed, we frequently seem to contradict Linneas' hopefulness in that don't seem to be very wise at all, living as we do in a modern world that is characterized by unnecessary conflict, violence, suffering, and poverty.

And yet the story is by no means one of only bleakness. The globalization of the economy during the last half-century has lifted nearly 2 billion people from poverty into much more comfortable, long, and healthy lives, and the promises of science and technology continue to suggest that these benefits may lift yet billions more in the coming decades.

Further, the cultural world that many of us inhabit is one of astonishing abundance, a plethora of brilliant inventions and discoveries has enabled us to fill our lives with countless luxuries, entertainments, and wonders, and our garages with abundant excess, resulting in a society where space travel and satellite communications are common, where the mass production of food and material goods are commonplace. Amazon tells us, for example, that it sells (a mere) 200 *million* different products.

We have built massive megacities that house tens of millions of people, highlighted on the large scale by skyscrapers towering a hundred stories into the sky, and in labs we create invisible nano robots at the tiniest scale, far smaller than we can see with our own eyes. Every promising niche in every possible market quickly finds an entrepreneur or a company that's willing to make a go of it, and as in nature, many also try to make a go of it in niches that turn out to be quite non-viable. But because the capitalist process is also a system that promotes experimentation, due to this relentless trial and error we have come to live in a globalized, capitalist society of endless possibility.

Nature is also a rampant experimenter, as indeed experimentation is at the very core of the evolutionary process. Through abundant experimental reproduction via genetic variation and natural selection, nature succeeds in identifying and occupying absolutely every possible niche in every ecological system and subsystem. The larger system itself evolves through the development of new species, which create new niches and doom others, and thus through its own persistence nature has identified millions of feasible niches that we know of, and there are probably many millions more plants and insects that we have not yet found or classified in addition to the infinitude of bacteria and viruses. And this is on one planet only, among billions or trillions in the universe's entire inventory; none of us knows who or what may live elsewhere.

But we ourselves may soon inhabit other worlds, at least some nearby to ours. In this century it is entirely probably that robots and possibly humans will take up residence in orbit around the Earth, or even on the moon or mars, and through this colonization of our solar system another vast learning journey may commence.

But it is humanity's rampant experimentation here on Earth that has brought an unprecedented rate of technological and thus social change, and therefore also unprecedented uncertainty. And as we look at a future toward which we are hurtling faster and faster, it's become harder and harder to know where we're headed, or if we're making the right choices.

Of course this raises many well-founded fears and concerns.

For those who lead organizations, the growing uncertainties constitute significant dilemmas as well as significant challenges. It's their job to make sound choices and lead their organizations toward successful futures, but this is much more difficult to do when change is accelerating and uncertainty is increasing. For ordinary citizens these are also trying times, as established norms and accepted values are in flux, a trend that partially explains the conservative backlash and the growing right wing extremism that infects nations on all continents. People afraid of change are lashing out at change makers, real and imagined.

And yet as a result of the pace of change, we know for certain that things will be different tomorrow, and the changes that are coming will require that we understand and operate in a different world, a changed world, and that we must therefore change how we think as well as how we act. The facts of reality, in other words, have changed.

This is certainly not the first time that change has pervaded society, but because the 21st century world of our creation is continuing to change quickly and so fundamentally, the facts that describe our reality are also changing, and the models, concepts and metaphors we must use to understand it are also changing. Past truths are no longer so valid as they were, and we need to consequently change our opinions about what's real, what's desirable, and the decisions we have to make. We need, that is, to change both how we think and how we act. And while the past is surely gone, the new world that's emerging hasn't yet fully arrived. So we're living in a challenging time of transition, and thus our capacity to survive will be a creative act: our situation requires us to invent new ways of thinking and living. What kind of world will it be? A world of right wing anger and blame? A world of respect and reconciliation? A world of fragmentation and chaos? Of commerce and profit? Of cooperation and creativity?

The Old Ways

Change and uncertainty are difficult to live with, as most of us prefer the old ways, the comfortable norms, the rules and principles we grew up with, came to understand, learned to live with, and which feel most natural to us. We have little choice, though, and fortunately it's not all uncertainty, as we know many useful things about today and about tomorrow. For example.

- We know that many of the children who are born this year will likely live to see the 22nd century, and thus will see with their own eyes what sense we are able to make of this world, and what society we are able to craft for them and for their own children and grandchildren to inhabit.
- We know that robots are probably coming in massive numbers, and that they will bring with them change throughout the economy and thus throughout society.
- We know that the Earth's climate is changing, and although we don't know by how much, we worry that it will be drastic and extremely destructive.
- We are beginning to understand that the fossil fuel based economy may be coming to an end, although it's not clear how quickly this is happening.
- We know that people prefer to live in cities, and that the world's cities are growing as the rural population continues to migrate, and that by the end of this century the world will be overwhelmingly urbanized.
- We know that as the result of all of the above, the pace of change throughout the world is accelerating which has in and of itself has created a cultural revolution that is occurring globally, one that is leading to new beliefs, attitudes, behaviors, and expectations in every neighborhood and favela and

refugee camp and suburb of every city in every nation. We also see the growth of a very frightening counter-revolution, a reactionary strain of anti-change that is characterized by strident dogmatism and sometimes vicious violence.

- And all this is happening as the world's way of living and working is becoming much more complex …

And because these deep and fundamental changes are occurring all at the same time and throughout the global economy, and in all of the world's cultures and all of its nations, we know that we face risks on a scale we have never seen before. To survive we must adapt to the world that we don't really understand even as we see that it is the one that we are ourselves are creating.

Hence, it does not seem to be in any way an exaggeration to suggest that humanity faces challenges unlike any that we have faced before. These are the challenges of revolutionary change, change to the very foundations of our society and our economy, and thus to our lives and to our futures. Here is a quick introduction to them

Five Revolutions

In fact, as the list above implies, we face not just one revolution, but five. Yes, there are five revolutions occurring today, along with one counter-revolution, and because they're all interconnected, global, and simultaneous, the magnitude of the impacts they bring is all that much greater.

Technology

Humans are skilled technologists who are relentlessly developing a high technology economy. Unfortunately, however, we don't really know what that means, or how to manage it, or how it will eventually work out. The impact of this digital revolution is being felt anywhere that someone is using a computer or a mobile phone, which is basically everywhere.

Computers have remade the entire economy during the last 30 years, but what's still to come in the next few decades will be much more significant than what's already been achieved because while the digital revolution has already accomplished amazing things, we're on the threshold of another giant leap forward, probably a much larger leap than the previous one. Soon, still more advanced computer systems and progressively more capable and more autonomous robots will come into widespread use, and their imposing skills and capabilities will reshape the economy at a much deeper level than the computer revolution has done so far. Digitally-driven change will continue to accelerate, and as it does existing products, services, companies, and entire industries will be made obsolete, and new ones will quickly take their places. Workers will find old industries disrupted, and thus many millions of workers and their families will be disrupted also.

While this much is clear, what remains unclear is how fundamentally the robotics revolution will redefine work, the workplace, and the relationship between labor and capital. Will *all* human workers become obsolete? Will the owners of robots become the next generation of the ultra-wealthy, consigning the rest of us to life in poverty? Will super-fast computers and limitless databases make repressive big brother surveillance a constant reality, or will they liberate us to explore, discover, and create? The more deeply we delve into the possibilities, the more interesting and also the more disturbing they become. We will look at these topics in detail in Chapter 1.

Climate

umans are also prolific combustors, or perhaps pyromaniacs would be a better term, and thus the second revolution is the unintended and unplanned transformation of the Earth's climate, the phenomenon of global warming, which has come about as a result of increasing concentrations of carbon dioxide in the atmosphere which go there because we burned so much coal, oil, and natural gas. Warming is already altering patterns of habitation and food production in many regions, and what's coming may be at a scale and scope that could constitute a fundamental threat to civilization.

Scientists foresee that the sea level will rise, that there will be increasingly intense and frequent storms,

and that significant changes to patterns of rainfall and thus agriculture will together result in massive disruptions. What we do not yet know is how bad things will get, how massive the scale of disruption will be, and how effectively or ineffectively the peoples, companies, and nations of the world will respond to the threat and then to the actual manifested consequences. This is the subject of Chapter 2.

Energy

To obtain the raw materials to feed our combustion habit, humans have become talented extractors, extraordinary miners and drillers who can procure valuable hydrocarbons from as deep as seven miles beneath the Earth's surface,[x] which brings us to the third revolution, directly related to the second, for it is the transformation of the world's entire energy sector.

For the last 200 years the world economy has been powered by fossil fuels, which we burn to generate electricity and fuel the vast majority of our transportation, manufacturing, lighting, heating, and cooling. But as we have by now realized that fossil fuels are the main drivers of climate change, we also understand that it becomes a great virtue to reduce or even eliminate our reliance on them altogether. And if the scale of climate change turns out to be on the more extreme end of possibility, then virtue will become a vital necessity.

Hence, whether it's achieved through foresighted prudence or reactive terror, it's evident that the transition to a new energy economy will accelerate over the coming 20 to 30 years. No matter the speed of this transition, during these coming decades we could witness the decline and the near termination of the fossil fuel economy, and thus the transformation of humanity's energy sector into reliance entirely on non-fossil and thus non-carbon sources. Will billions of barrels of oil remain in the ground permanently, defining the end of the oil era and the fossil fuel economy and thus bringing with it massive disruption to the economy? Or will we transition slowly and gracefully to a sustainable energy society?

Since the energy sector constitutes the single largest component of the global economy, the economic dislocations that will occur as this process unfolds will inevitably be very far-reaching. Energy producers, investors, and the energy markets will all feel massive disruptions, but of course the hardships for fossil fuel producers are also vast opportunities for solar, wind and battery firms, as the world's appetite for energy will not decline, only its appetite for fossil-based, carbon-producing energy.

It's also evident that the digital revolution is central to the energy revolution, for the new science and technology that make solar and wind generation cost competitive with fossil sources are quite dependent on the digital capabilities in their design, engineering, and operations. Hence, we see that the first three of the revolutions are all intimately connected to one another, which only serves to amplify the amount of disruption that we'll experience as they progress, and also the scope of opportunity that this situation presents to the agile, nimble, and entrepreneurially minded. The energy revolution is the subject of Chapter 3.

Urbanization

Humans are also exceptional builders, with thousands of years of experience constructing huts, towns, cities, skyscrapers, and now space stations, and this has led to the fourth major change that's occurring in our times, the decisive impact of rampant urbanization. As we will explore in depth in Chapter 4, urban and rural families make quite different choices about the number of children they wish to raise, and as humanity completes the transition from a rural, agricultural civilization of the 18th century to the fully urbanized one of the 21st, the population explosion that began 200 years ago is coming rather quickly to an end. This has fundamental consequences for the global economy, and brings significant implications to many nations and to humanity as a whole, in ways that may be both very positive, and also quite challenging.

On the positive side, slowing population growth is obviously better from the perspective of resources preservation. We know that the global economy is already consuming far more resources than Earth produces on an annual basis, and thus we're consuming Earth's resource capital rather than its interest, which means that the current structure of the economy is not sustainable. Hence, bringing population growth to a halt is a very positive step toward stabilizing the rate of production and consumption. Largely because of urbanization, what we're experiencing now, for the first time in 200 years, is a decline in the

overall rate at which the population is growing.

Declining birthrates are already having major impacts in many nations, such as Japan. Japan's population expanded quickly during the 19th century, but by the end of the 20th growth had stopped and population decline began, which has created a difficult situation for the Japanese economy, now stagnant for two decades. Forecasts for the future of Japan suggest that by the end of the 21st century its population will be about half of what it is today, which implies major disruption at minimum, but also presents the possibility of social, economic, and geopolitical collapse.

This is notable because what we may soon discover is that the experience in Japan will be repeated in dozens of countries, and then throughout world as a whole. Based on current trends, it's quite possible that by mid-century the overall human population will have peaked and then begin to decline. This will present a major challenge to the world economy because the industrial era's booming economic growth has been fueled by waves of young workers coming into the workforce and into the consuming force, but as population growth slows, and then stops, today's patterns of economic production, consumption, retirement, and health care will all change significantly.

We should anticipate that these changes will disrupt everything, except that everything will already be in the midst of disruptions caused by the transformation of the global economy to a fully digitized and possibly fully roboticized, climate-change threatened, energy-transitioned, quite different place than it is today. The peak of the population curve will only serve to amplify those other changes. We will examine this in more in Chapter 4.

Meanwhile, as all these changes are occurring, millions of people each year will still be moving from the world's farms to its cities, and in the process creating even more massive mega-cities in which more deadly concentrations of pollution, mega slums, and organized crime threaten to coexist with brilliant economic opportunities and the potential to bring tens of millions from poverty to relative economic and food security.

No one kind of city, nor any one size of city, has a monopoly on creativity or the good life; but the biggest and most cosmopolitan cities, for all their evident disadvantages and obvious problems, have throughout history been the places that ignited the sacred flame of human intelligence and the human imagination.[xi]

Culture

The simultaneous impact of four revolutions is inexorably creating a fifth, which is the massive impact that all of this is having on human psychology and sociology, or in a word, on our culture. At times humans behave in ways that are quite civilized, but others we behave with cruelty and brutality.

The evolution of our global civilization is of course already having and will continue to have decisive influence on how we live, work, think, and feel, and all of these changes and uncertainties have enormous impact on our values and beliefs, on our expectations and hopes for the future, on our attitudes and behaviors. Are we confident about the future of our nations, our companies, and our culture, or are we drenched in fear? Are we embracing change, or cowering from it? What conflicts, cultural and military, will arise between nations, between generations, between religious, ethic, and identity groups, as our situation and our prospects change?

It's obvious that we're in for severe psychological shocks, shocks to individuals that occur on such a wide scale that they become shocks to society as a whole. Hence, we are living through exactly what Alvin Toffler forecast forty years ago when he recognized that the psychology of his times was *Future Shock*.[xii] But now, forty years later what we're experiencing isn't future shock, it's *now shock*. How will we cope with it? This is the subject of Chapter 5.

For the optimists, entrepreneurs and opportunists this is a time of exceptional possibility, a time when anything can happen. For pessimists and the frightened it's an era of heightened trauma and disappointment, when our worst fears are realized.

And the Counter-Revolution

Among the frightened and shocked are a large and what appears to be growing group who react to the emerging world with an experience of such extreme anger and despair that they turn to reactionary violence, to terror, to both express their loathing of modernity and to destroy it. Their intent is to inspire a counter revolution against the values and freedoms they oppose, and while history is not on their side, fear is. We will explore the counter revolution in Chapter 6. •••

This, then, is the grand experiment that the 21st century humanity has unintentionally launched. Technology, climate change, the energy transformation, urbanization, a cultural revolution, and a counter-revolution, these are central and simultaneous themes in the experiment that we are creating and living from day to day, an experiment the outcome of which will define our common fate and set the course for our children's fate and their children's as well.

History's Revolutions

Another apparently innate human quality is skepticism, and if you're naturally skeptical, and even if you're not, it's perfectly reasonable to question whether these 6 changes really are revolutions. Could it be that they're just more of the same, more of what we've been experiencing for the last 50 years, or the last 200 years, or the last 10,000? Perhaps I'm overstating the case, and that really this is all part of history's natural change process, the results of our continuing proclivity to experiment.

Indeed, revolutions, even violent and tumultuous ones, are nothing new in human history. In technology, energy, urbanism, and culture revolutions are not new to humanity, and you have fair reason to wonder if these five revolutions are really such a big deal. Is it actually necessary to call these "revolutions," or have we seen this all before?

In succeeding eras of human history our ancestors learned to use new tools, to solve new problems, to think differently and to live differently than before. The agricultural revolution from which the first cities emerged led to the formation of great empires in China, Southeast Asia, India, the Middle East, North Africa, Europe, and the Americas, each in its own way revolutionary.

The Renaissance of the 15th Century and the Enlightenment of 18th were periods of revolutionary ideas and profound changes in Western society and economics. Political concepts that drew from Arabs, Athenians and Romans were reborn and spread rapidly through printing, which made it possible to produce and distribute books on a mass basis. Literacy and learning exploded, and we can trace a clear connection from the renewed principles of inquiry to the emergence of new forms of political organization as well as to the systematic practice of science, and so developed the revolution in knowledge that then led to industrialism at the beginning of the 19th century.

In the decades around 1800 the methods of industrial design, metallurgy, mass production manufacturing and global distribution that became the basis of our own economy were being worked out by trial and error. Science continued to expand, with generation after generation of researchers building on all that came before them, and thus Newton remarked that he stood on the shoulders of giants, and other giants subsequently stood on his shoulders. This progression led quickly to discoveries of foundational principles in physics and chemistry and biology, in anatomy and physiology, in health care and sanitation, finance, economics, and in steel, oil, electronics, transportation, weaponry and warfare, in our understanding of the atom and the subatom, of the cell, the organ, the organism, and the ecosystem.

In the realm of nations, the battlefield triumphs of Napoleon led to the transformation of warfare from slow and stagnant parades to the cacophony and chaos of mass produced weapons, mobility, and relentless firepower. The 19th century's defining conflicts were the defeat of Napoleon, and half a century later the American Civil War, also the world's first industrialized war, the first time that industrial capacity was unleashed to wreak an unprecedented scale of destruction. The victorious North simply outproduced the vanquished South, a victory of capitalism that showed the way forward to the still greater expansion of destruction that would follow soon thereafter.

Further, we've seen massive changes in all fields of thought and study from decade to decade, century after century, from politics and government to science and technology to the arts and economics. Indeed,

one overall interpretation of human history depicts it exactly as a progression of revolutions, from the agricultural revolution of prehistory to the empires of 3 successive millennia to the knowledge revolutions of the Renaissance and the Enlightenment, to the political and governmental revolutions of the 18th and 19th centuries, the industrial and commercial revolutions of the 19th, and then the 20th century's multiple revolutions in science, technology, medicine, manufacturing, computing, warfare, weaponry, etc. etc., which seem never to stop.

Capitalism is a system in permanent flux: it changes character over the long term, and as it does, it throws up new structural problems requiring (or at least inviting) solution. In the early- and mid-nineteenth century, the overwhelming problem it threw up was the transition from an agrarian to an early industrial economy and society, which vastly multiplied the scale of necessary urban organization. Since the late nineteenth century, some of the most important long-term trends have been the progressive displacement of small by large capital; the movement from goods-handling to service provision; above all information-handling, in advanced economies; the globalization of the economy, and the new international division of labor by process rather than by product.[xiii]

And now here we are, two centuries after the onset of the Industrial Revolution and the majority of the world's people have been drawn into a single global economic system, a giant process, and thus have as a matter of survival been forced to, or in the search for opportunity been inspired to experiment and to innovate in order to preserve their livelihoods and their families. Many of us benefit from improvements in nutrition and health care that are extending the lifespan of the average human; today the average American male lives to about age 78, and the female to about 84.[xiv]

For businesses and governments change at this global scale and so massive in scope presents an endless cavalcade of challenges, and thus the lifespan of a typical large corporation is steeply in decline. A Fortune 500 company that has arrived, finally, at the pinnacle of economic success as a "blue chip" company can now expect to survive for only 15 or 20 more years, and because of accelerating change the corporate survival rate is decreasing rather than increasing.

This is in some respects unexpected. Would it not be reasonable to expect that giant companies, with massive resources and huge and highly trained staffs of professionals would have the skills and expertise and power, not to mention the market share and capital advantages, to protect themselves, to endure? With all their many strengths, shouldn't they ought to last a really long time?

Alas, this is not the case. Whereas a generation ago it was normal for a large corporation's lifetime to span 50 or 60 years if not a century, the massive waves of change that course regularly through the economy have taken a heavy toll on corporate longevity. New technologies and the companies that create them replace old ones in ever more rapid succession.

The risks extend to nations, and although they don't generally disappear or go bankrupt in the way companies do, some do find themselves under severe stress, and when they do their citizens suffer for it. Ask millions Greeks, who have endured heavy years of economic decline and struggle now with massive unemployment and very bad prospects for many years to come, or millions of Syrians, who have been forced from homes that their families have occupied for centuries by a brutal, four-sided civil war. Ask the citizens of Vanuatu and the Maldives, two among the world's very low lying nations who are likely to see their homelands submerged under the rising oceans.

So are the changes I'm describing genuinely revolutionary, or is that merely a convenient if over-dramatic label? In astronomy a revolution is one complete trip all the way around, which on Earth is a year's worth of travel around the sun, a complete cycle. In politics, revolution signifies the overthrow of the existing order in favor of a new one, a process that generally has winners who record their triumph, and losers who merely endure it.

The key words are "complete," "all the way around," "overthrow," and "existing order," and from them we get the meaning clearly. What I'm describing is indeed the convergence of major changes that are causing fundamental changes in how society functions, which together will lead to new structures throughout the economy, society, and culture. There are certainly winners and losers, and thus I conclude that these changes are indeed revolutionary.

Furthermore, because all of these changes are occurring simultaneously and because they're deeply interconnected with one another, the scope and impact of the consequences they bring is magnified. And this is a key point, because when big events or trends occur separately or independently then the magnitude of their impact is often considerably less, as there is time to adjust our actions and our expectations. When multiple changes occur that are simultaneous and connected, however, there may not be time to understand it all, and it's much more difficult to identify the best courses of action. The more connected the world is, in fact, the more complex are the patterns of change, the greater the threats that are created, the faster changes occur, and thus the greater the risks that are created.

In our world, throughout human culture and the one-world economy, the social and economic interconnections are now complete. We know that whatever happens in Mumbai affects how people feel and think in Munich; events and trends in Beijing are significant in Boston; breakthroughs and failures in Silicon Valley have meaning in Stockholm, Santiago, and Sydney; and the war in Damascus and Aleppo has immediate impact in dozens of world capitals, and everywhere else. What happens everywhere impacts on what happens anywhere, and it simultaneously impacts on what people think and feel about the world, their lives, and their futures.

And when the forces of change are thus so deeply connected as they are now the risks to organizations and to society as a whole are compounded. The reality of this convergence is what suggests that the risks we live with today are indeed transforming into mega-risks that will deeply and profoundly threaten us tomorrow.

At the same time in our fully connected world the confluence of changes that bring these mega risks also bring unprecedented opportunities. That risks and opportunities arrive in concert is one of the essential patterns of change.

The Patterns of Change

Is the momentum of change now so fast and the flow of history so quick that the best we can do is to hang on? Or do we already have – or can we develop – the capacity to steer, to choose, to design a preferred future, rather than being stuck by default with whatever happens?

The nature of our world and our economy makes it extraordinarily difficult for most institutions to respond systemically and proactively to the great driving forces of change, and this is true even when their own leaders see and recognize this quite clearly. That is, even when they see change coming, large institutions often fail to avoid the violent impact. It is for this reason that Louis Gerstner commented (about IBM, in this case, where he was CEO), that, "We agreed that we needed to change, but we didn't change."[xv]

The significance of Gerstner's comment is not its description of IBM, but because it describes all of us and all of our organizations. We see that things are indeed changing, but we so rarely take the actions we ought to take in advance. Instead, we react afterwards, and frequently we do so badly, and we often take short-sighted actions that rebound to make things worse.

How, then, can we overcome these dysfunctional patterns? Skilled leaders and strategists search for the patterns behind change because they recognize that understanding the patterns will often help to decode the future and guide them to the right actions. Hence, we study the transition from the agricultural societies of the eighteenth century to the industrial ones of the nineteenth to better understand the transition from the twentieth century's industrial economy to the digital one of the twenty-first.

Historians have also extensively studied the birth and decline of the world's great empires, among them of course the Egyptian, Roman, Chinese, and British, and their studies provide important clues about empires that are now emerging. Resurgent China, young technology companies such as Google and Apple and Alibaba, cultural empires centered in Hollywood, Bollywood and Paris, governments and multi-nation partnerships of the EU and the UN, in the emergence of all of these we see patterns that help us to anticipate the further changes to come, changes that will affect not only their central actors in each story, but the rest of us as well. We will examine many of those patterns here.

7.3 Billion Revolutionaries

The American Revolutionary War began in 1776 when 52 leaders from 13 colonies signed the document they called the Declaration of Independence. Jefferson had written, "We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness."

Most of the revolutions of our times, however, are not being instigated by small groups of wealthy citizens, but by the combined actions of not just millions, but the entirety of the 7.3 billion women and men, all of us, who are all engaged in a social and economic process of globalizing change, one that is the culmination of millennia of progress and development. We do not know what the outcome will be, but we do know that we humans bring extraordinary capabilities to this laboratory in which we are both the experimenters and also the subjects of the experiment.

Our laboratory is the entire Earth itself, and our era is the Anthropocene. The Anthropocene has come about as the result of our many skills; as technologists, combustors, extractors, builders, and humanists. But that is not all we are. We are also visionaries, who can anticipate the future, realists who can assess risk, thinkers who evaluate options, strategists who discern the strong and weak points. We are also map makers, who seek to identify our exact spot not only on our little globe, but in the entirety of our galaxy and the incomprehensible vastness of the universe. We are planners, who organize our efforts, and philosophers, who seek to distinguish good from bad, right from wrong, and innovators who create new ideas and create change along with it. And also among us we sometimes find exceptional leaders who point us the way forward and guide us on the journey.

Thus, it's fair to say that humans are all-purpose organisms for learning *and* for doing, and along with all our many flaws and the potential to disappoint ourselves with the most dreadful and selfish evil, we also have the transcendent potential to create joy and beauty and inspiration.

And while we cannot know the future that these current revolutions will bring, it's evident that as the changes we are creating will be momentous, they are indeed fairly labeled as revolutions, and that the world we leave to our children and grandchildren will be fundamentally different from the one we ourselves inherited.

It remains largely up to us to determine the type of world that we will create, as it may be a world of inspiring possibility and triumphant promise, or it could be an awful, wretched mess.

As we come to better understand who we are, the revolutions that we are creating, the risks that we face, and the best strategies for meeting those risks, so we may also discover astonishing and wonderful possibilities and opportunities that these changes could bring, and by realizing this potential we would offer to our descendants much better prospects than the ones we seem to be facing ourselves. This is our opportunity, and the philosopher tells us that it is also our responsibility.

Welcome, then, to an exploration of the future that we are rushing headlong towards even as we still maintain much of the power that enables us to give it its distinctive shape.

Notes:

[I] Darimont, Chris T., Caroline H. Fox, Heather M. Bryan, and Thomas E. Reimchen. "The unique ecology of human predators." *Science 21 August 2015: 858-860.*

[II] Silver, Nate. *The Signal and the Noise: Why So Many Predications Fail – But Some Don't.* Penguin, 2012. P. 13.

[III] Wines, Michael. "Human Activity Increases Risk of Big Quake in Oklahoma and Kansas, Experts Say." *The New York Times,* March 28, 2016. http://www.nytimes.com/2016/03/29/us/earthquake-risk-in-oklahoma-and-kansas-comparable-to-california.html?_r=0

iv http://www.anthropocene.info/

v Subcommission on Quaternary Stratigraphy, Working Group On The 'Anthropocene:' The 'Anthropocene' is a term widely used since its coining by Paul Crutzen and Eugene Stoermer in 2000 to denote the present time interval, in which many geologically significant conditions and processes

are profoundly altered by human activities. These include changes in: erosion and sediment transport associated with a variety of anthropogenic processes, including colonisation, agriculture, urbanisation and global warming. The chemical composition of the atmosphere, oceans and soils, with significant anthropogenic perturbations of the cycles of elements such as carbon, nitrogen, phosphorus and various metals. Environmental conditions generated by these perturbations; these include global warming, ocean acidification and spreading oceanic 'dead zones'. the biosphere both on land and in the sea, as a result of habitat loss, predation, species invasions and the physical and chemical changes noted above. (The Subcommission on Quaternary Stratigraphy (SQS) is a constituent body of the International Commission on Stratigraphy (ICS), the largest scientific organisation within the International Union of Geological Sciences (IUGS).) http://quaternary.stratigraphy.org/workinggroups/anthropocene/

vi Fuller, Buckminster, *Operating Manual for Spaceship Earth.* Clarion, 1970.

vii Gopnik, Alison. *The Philosophical Baby.* Farrar Strauss and Girous, 2009. P 91.

viii Alison Gopnik. The Philosophical Baby. Farrar Strauss and Girous, 2009. P 87

ix Henrich, Joseph. *The Secret of Our Success: How Culture is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter.* Princeton University Press, 2016. P. 3 – 7. (This is not a direct quote but a montage, and includes some paraphrasing as well.)

x In 2012 Exxon Neftegas Ltd (ENL) completed drilling the world's deepest well in the Chayvo oil field on the Sakhalin shelf in the Russian Far East. ¬The shaft of well Z-44 is 12,376 meter deep.

xi Hall, Peter, *Cities in Civilization*. Fromm International, 1998. P. 7.

xii Toffler, Alvin. *Future Shock.* Random House, 1970.

xiii Hall, Peter, *Cities in Civilization*. Fromm International, 1998. P. 932.

xiv https://www.ssa.gov/planners/lifeexpectancy.html

xv Gerstner, Louis V. *Who Says Elephants Can't* Dance? Inside IBM's Historic Turnaround. HarperBusiness, 2002.