

Book Chapter:
FORESIGHT and EXTREME CREATIVITY
Strategy for the 21st Century
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Chapter 7: The Futurist: The Patterns of a Changing World

I sometimes find that I simply have too many thoughts and memories crammed into my mind. At these times I use the Pensive. One simply siphons the excess thoughts from one's mind, pours them into the basin, and examines them at one's leisure. It becomes easier to spot patterns and links, you understand, when they are in this form.

So said Professor Dumbledore, to Harry Potter
J.K. Rowlingⁱ

One of the most prominent topics in mythology and fiction and thus one of the self-organizing themes of every culture is the power of magic. The boundaries and limitations that confine us in the material world are close and burdensome, and so while our visions and imaginations soar without limitation we seek desperately to leave the bonds behind, and in this magic becomes our panacea.

However, magic is also more than a panacea when it allows us to glimpse into a world where we're really not so constrained and where we may transcend our limits through effort, innovation, and creativity. We thus redefine ourselves not as limited corporeal beings, but as aspirational and transcendent ones.

From this perspective, Harry Potter is no mere 11 year old boy riding a broomstick and fighting the bad guys, but rather a universal role model for the individual and shared aspirations of an entire community that is engaged in the timeless battle between good and evil. As we learn from Joseph Campbell, this is precisely the role that myth has played throughout the millennia of human development.

Mythology has been interpreted by the modern intellect as a primitive, fumbling effort to explain the world of nature (Frazer); as a production of poetical fantasy from prehistoric times, misunderstood by succeeding ages (Muller); as a repository of allegorical instruction, to shape the individual to his group (Durkheim); as a group dream, symptomatic of archetypal urges within the depths of the human psyche (Jung); as the traditional vehicle of man's profoundest metaphysical insights (Coomaraswamy); and as God's revelation to His Children (the Church). Mythology is all of these.ⁱⁱ

It is also the case that we, too, are living in a time during which we are surrounded by powerful forces that often seem beyond our comprehension, forces that inspire in us great excitement but also great fear, and that seem to evoke the powers of the universe and the powers of human thought. How else can we understand atomic weapons, and computers that think, and economic systems that engage 7 billion of us in a single marketplace of production and trade, and a culture in which the transformative power of ideas and ideals inspire great thoughts and also suicidal murderers?

And yet it is precisely up to us to comprehend these great forces, to bring them into alignment with not only who we are but who we aspire to become. And so while our capabilities as planners, strategists, and visionaries would indeed be much better than they are if we had Professor Dumbledore's available to us, it is alas an instrument of magical fiction, and here we are trapped in the too-real world. Here we must make do by utilizing the patterns and links we can identify through careful study, for if we are to understand and steer the revolutions of our evolving world then these are exactly the factors we must come to grips with.

In this chapter we focus on clarifying the challenge by identifying the most meaningful patterns. We have already explored six essential aspects of our humanity that have become five revolutions and the anti-revolution, and studying them in combination it's evident that a first important pattern is our consistent proclivity to pursue the new, the different, the novel, and the technologically advantageous, and in so doing to create revolutions. As a species we are innate makers of revolutions, even as the revolutions themselves create many anti-revolutionaries among us.

And as we seek to understand exactly what those revolutions consist of and what their impact will be, we recognize that if we can map them in some way we can get a much better understanding of how they are unfolding. Among the most useful of the maps are the simple line graphs that show how things are changing over time.

Curves

Among the line graphs we've already looked at, one of them is particularly significant as it charts the advance of digital technology and its growing impact throughout the economy. Stripped to its essence, the converging trends of digitization give us the deceptively simple ascending and descending exponential curves of the D-Curve which we explored in detail in Chapter 1. The ascending line tells the story of the pauper and the king and the chess board and the rice, its purpose to help us see how an apparently simple doubling of the quantity of anything, whether rice or computer chips or even potato chips, quite soon leads from a unit of one to units of tens of thousands and then millions. The descending line, meanwhile, denotes the declining cost of computer chips, and if we can sustain the progression long and steadily enough the outcomes are transformative.

It may be difficult to grasp from the simple and graceful arcing line, but in fact this line expresses a power that will utterly and completely reshape the economy, and thus it will also reshape each of our lives. From their combined dynamic of exponential progression we grasp that we are entering the digital danger zone, as we will soon reach the point at which technologies including robotics, big data analytics, artificial intelligence, and ubiquitous surveillance sensors combine to transform the ways we work and live, which describes the path upon which we are venturing as we transition from the industrial economy to the digital one.

More broadly, the exponential change curve depicts a fundamental aspect of reality because it also describes the overall rate of change; exponential change is having and will continue to have a massively disruptive impact on families, companies, governments, and society.

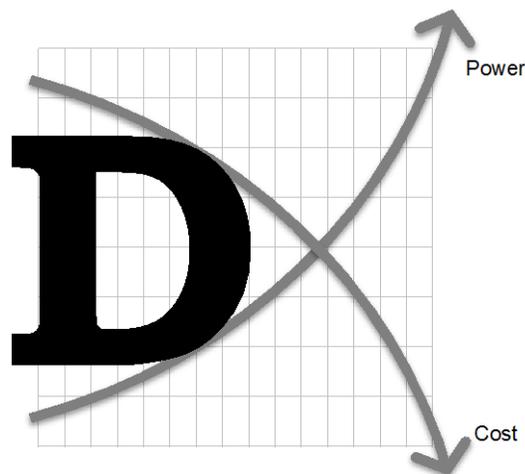


Figure 71. **The D-Curve**

Increasing power of computer chips is an exponential progression known as Moore's Law, while the cost declines on a reciprocal curve, which makes computers better and cheaper each year.

The D-Curve explains that as computer chips are made progressively smaller, more powerful, and less expensive, they are useful for more and more functions as the complexity of the tasks they can be programmed to perform increases substantially, and they simultaneously become readily affordable. A computer that cost billions of dollars and occupied an entire air-conditioned computer room in 1975 costs five hundred dollars and fits comfortably in your pocket in 2015. The computer of 2025 will be many tens of times still more powerful, and thus able to perform many more important functions than just playing Candy Crush and watching cat videos, and in the years following that will begin to approach the computational density of the brain, enabling huge advances in artificial intelligence and robotics, which will also be transformative.

It appears that no established company is safe from the disruptive consequences, as the global giants like Sony, Nokia, and Kodak have already been brought down by change, and so have most of the local bookshops and taxis and drugstores and, and, and...

To explain these business failures we draw a second curve beneath the exponential change curve in Figure 72, the lower line representing the capacity of organizations to change. As it lags behind the real rate of change as signified by the exponential curve we can anticipate that the results will not be good. Some thoughtful experts on innovation and change have labeled this the "going out of business curve"ⁱⁱⁱ because that's the predictable outcome.

Going out of business as a consequence of exponential change in the market or in technology is thus the organizational counterpart to future shock and the fundamentalist overreaction of those for whom modernism and accelerating change are psychologically overwhelming.

So if the exponential change curve is one of the fundamental elements of today's and tomorrow's realities, what is the necessary response? It is, of course, to speed up the rate at which organizations respond.^{iv} This is a timeless theme that is addressed in each of the remaining chapters of the book in various ways.

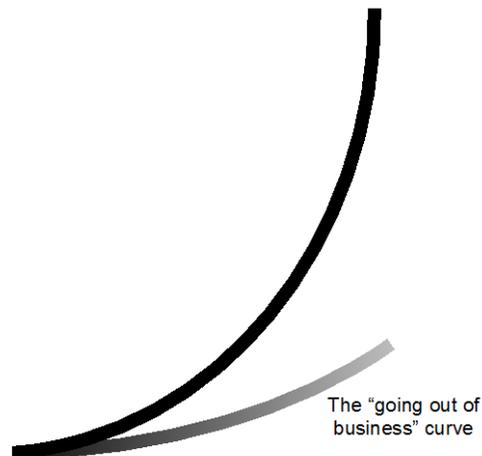


Figure 72

The "Going Out of Business" Curve

While change in the external environment is following the black curve of exponential change, organizations often have trouble keeping up, and the best they can manage internally is depicted by the gray curve, in which case they are most likely engaged in the process of going out of business. This problem is particularly acute for businesses in the technology sector, but as technology is infiltrating into every industry now, the distinction between technology companies and non-technology companies becomes irrelevant; *all* companies are technology companies.

Three Phases of History: From Stability to Explosion to Implosion

As I discussed in Chapter 4, demographers anticipate that the process of large scale migration to the cities will most likely continue throughout this century, and if current trends hold then by 2100 about 95 percent (or more) of humanity will be living in cities, small, medium, or large. As city dwellers, families will probably choose to have fewer children, and the net result will be that the human population will likely reach its peak by the middle of this century, or earlier, and by the end of the century it could have returned nearly what it is today.

As we saw, over centuries from prehistory through ancient times, the population grew very gradually in the global agricultural civilization that had persisted and developed for millennia, but everything changed with the industrial revolution that enabled the population explosion in the decades following 1800. Machines, sanitation, medicine, and improvements to agriculture proceeded around the world nation by nation, and by 1900 the human population had grown to 1.6 billion, and then to 2.5 billion by 1950. Over the following 40 years, the population doubled again to 5 billion, and the added another 2.5 billion to bring us to the Present.

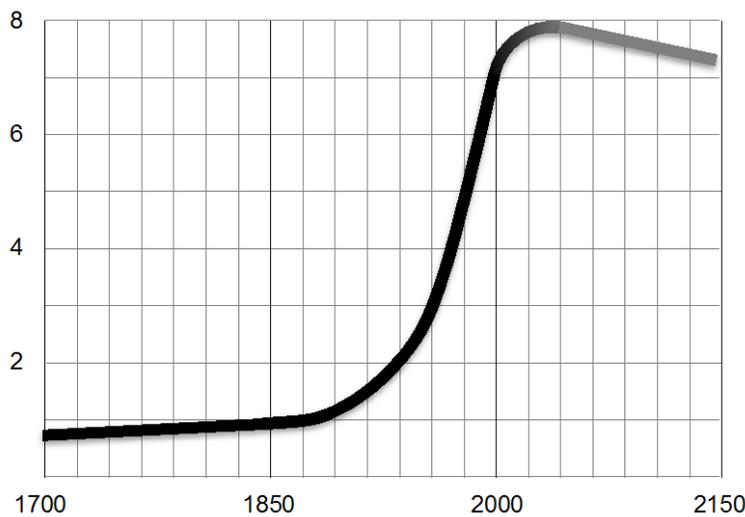


Figure 73
Total World Population, 1700 to 2150

Urbanization has been occurring steadily throughout the same period, and thus about 50% of the world's population was living in cities by 2010. Not coincidentally, this also marks the point at which the population growth rate begins to slow.

The majority of the world's population growth is occurring only in a few countries, including India, Nigeria, Pakistan and Indonesia, which remain substantially rural, but as they, too make the transition to urbanization, the world's entire population will likely peak and then begin to decline.

While the global population forecast suggests that the population peak will not come for another few decades, in selected locations it has already arrived. Japan is the world's most urbanized nation and its population, as we discussed, peaked two decades ago. Today it is thus facing a baby bust and an elder boom, which has fundamental social and economic consequences that will bring lasting and difficult change in every prefecture. There is already a marked increase in retirees and their associated health care and social needs to fill, but a shortage of workers and of working taxpayers.

The long term forecast is not inevitable, but there has been nothing evident in human behavior and culture during the last 30 years to suggest that anything different will emerge. If the future does indeed unfold this way then the overall historical pattern of human population growth curve from 1700 to 2150 will look like Figure 74.

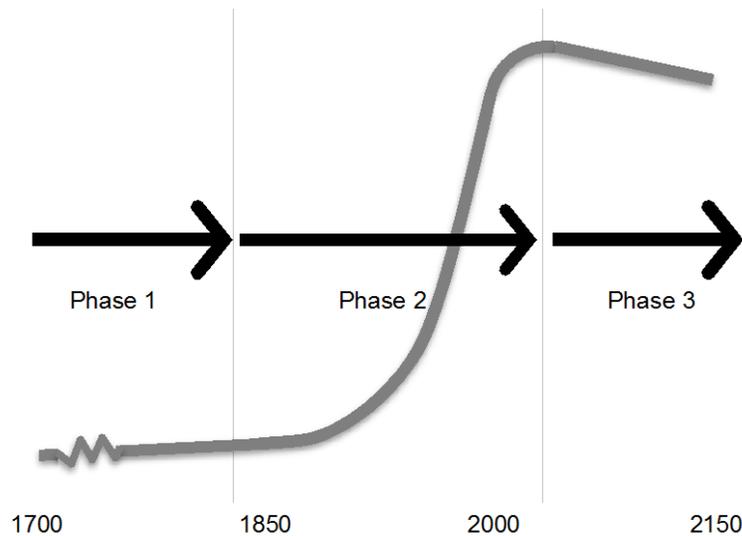


Figure 74

The Population S-Curve and 3 Phases of Human Civilization

During Phase 1, the Agricultural Era, the human population grew slowly from around 10 million to 1 billion between 10,000 BC and 1800 AD. During the Phase 2 Industrial Era from 1800 to about 2050 the population boomed, and it now appears that we are entering Phase 3, during which population growth will stop and gradually reverse.

Figures 73 and 74 give us the shape of the population graph from 10,000 BC to today, and today to 2150, a distinctive S form showing human history as a function of the human population. Simply due to the shape of the curve, this view suggests that the history of civilization consists of three very distinct phases.

Phase 1

Phase 1 was the Agricultural Era, tens of thousands of years of progressive learning about plant and animal husbandry, enabling the development of cities, and in those cities the progressive development of technologies in every field, including printing for the sharing and systemization of knowledge, transportation, commerce, and trade, optics and toolmaking for improvements in science and technology.

By 1800 total world population was about 1 billion; 97 percent were still occupied raising food; a small portion, only 3 percent were engaged in specialized functions in urban settings. Advances in metallurgy result in iron and steel, and thus the Industrial Revolution is born as the combination of need, opportunity, and knowledge create the steam engine, and all the rest.

Phase 2

Phase 2 is the Industrial Era, the period that is now apparently ending. For 200 years industrialization was the super-powered motor that drove the industrial economy to achieve incomprehensible scale and scope. World GDP multiplied many times over, living standards increased, fewer and fewer people

produced more and more food, and the world's population boomed as its cities expanded rapidly.

The economic system of industrialization is nothing like that which came before, based as it is on the transformation of resources into goods on a vast scale. The world's land surface is marked by cities and roads, mines, oil wells, reservoirs, canals, rails lines and power lines across the entire landscape that connect everyone to everyone else. Nearly 7.3 billion people participate in a single economic system of finance, production, trade, and consumption, and more than half have moved into the steadily expanding cities.

Commerce crosses borders and battlefields without regard for any limits, and with many deep ironies. President Assad's Syria, for example, obtains much of the oil it desperately needs from its adversary ISIS, which controls territory with abundant oil production facilities; revenue from those very sales enables ISIS to mount further attacks on Assad. The Chinese Army, meanwhile, is the largest supplier of tobacco to the Chinese people, contributing thereby to the deaths of millions of people whom it is also committed to protecting. Commerce follows its own logic, the logic of revenues and profits but not necessarily of ethics or rationality.

As the slightly ascending population line denotes Phase 1, the steeply ascending line defines Phase 2. And that steep ascent also has been essential to the economic success of industrialism. Once the dynamics of the consumer economy emerged following the Depression of the 1930s it was the steady flow of new workers and consumers into the market that enabled the economy to grow so quickly. We have become entirely accustomed to the economic model based on resources extraction, capital investment, consumerism, and growth, and no one remembers anything else.

Phase 3

But the prevailing model of industrial economics based on increasing population and increasing consumer demand may have nearly reached its limits. Demographic trends already show that population growth has slowed, and as the slowing continues we are headed to a population peak, and probably then into a decline.

From nearly every perspective this is positive news, as the current population is already overtaxing the global ecosystem and humans consume each year much more in natural resources than the Earth produces. Just in time, perhaps, we'll reverse population growth and switch in the opposite direction. Of course this transition is fraught with risks, as we have seen in the previous chapters, many kinds of threats and challenges.

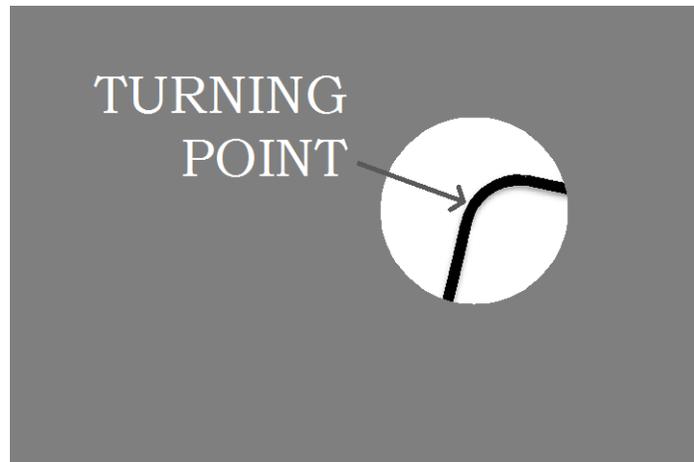


Figure 75

The Turning Point

The model suggests that the transition from Phase 2 to Phase 3 has already begun, which implies that global society is now beginning the transition to entirely new social and economic structures.

In Japan it appears that the third phase has already begun, and the nation is experiencing the challenges of a declining birth rate and thus a rapidly aging population, widespread malaise, depression and an epidemic of suicide, and despite 20 years of economic experimentation of nearly every kind, a chronic inability to grow its economy. What has already arrived in Japan could well be what's in store for much of the rest of the world. What we will require in Phase 3, then, is possibly an entirely new economic system. Morgan Stanley economist Ruchir Sharma explains it this way:

In every single region of the world, economic growth has failed to return to the rate it average before the Great Recession. Economists have come up with a variety of theories for why this recovery has been the weakest postwar history, including high indebtedness, growing income inequality, and excess caution induced by the original debt crisis. Although each explanation has some merit, experts have largely overlooked what may be the most important factor: the global slowdown in the growth of the labor force. Between 1960 and 2005, the global labor force grew at an average of 1.8 percent per year, but since 2005, the rate has downshifted to just 1.1 percent, and it will slip further in the coming decades as fertility rates continue to decline in most parts of the world.^v

Some of the outlines of a new system are already coming into focus. It will be fueled not from fossil sources, but from sun and wind. It will be increasingly dependent on technology that is increasingly advanced and ever cheaper, reflecting the D-Curve, and if current trends continue then technology may soon reach and then surpass human intelligence. This technology will include robotics, and the mass scale use of robots will also significantly shape the economy. It will be a urbanized era, even more so than the world already is, and many new cities may have to be built to replace the low-lying ones that have flooded out due to climate change.

The Shape of the Curve

In this three-phase view of human history we allow the shape of the population curve itself to explain the structure of history. There are other ways that we could chart our path, as a function of technology, for example, or in terms of economic growth, or by looking at the speed of transportation or the mobility of the population. But using the S-Curve that shows the human population over 12,000 years embodies a reality that is simple, clear and convincing. It explains a great deal for which we otherwise lack explanations, as it shows the relationship between how we live, how many of us there are, and how society and the economy are organized.

Seen in this way, history is obviously marked by two major transitions, the first being the industrial revolution around 1800 when the population explosion begins, and the second the as-yet-unnamed turning point that we are just now entering. Based entirely on the shape of the curve it's easy to foresee that change would inevitably impact our social, cultural, and economic lives, and as we are already experiencing those impacts, the S-Curve itself offers a helpful explanation.

This graph also tells us that although the population explosion is unquestionably significant, it was in fact a short lived transition between an agricultural civilization of 1 billion and an urban-industrial-digital civilization of about 7.5 – 8 billion. This very short phase of 200 years of economic growth and population boom was based on a cycle of increasing efficiencies in production that enabled increasing consumption, and increasing consumption that was largely a consequence of urbanization. The health of the economy was predicated on the triple phenomena of population growth, industrialization, and urbanization that enabled and indeed stimulated steady increases in production and consumption, to create handsome profits in the capitalist economy.

As we shift into the third great era of modern history, however, it's clear that no one knows what the underlying economic model will be. But it's become increasingly obvious that it will *not be* based on attaining ever greater levels of consumption, because we know that the Earth's resources will not sustain further increases. As we already consume more on an annual basis than the Earth produces on an annual basis, our current economic model is not going to continue indefinitely.^{vi}

This tells us that we will necessarily shift from an economy and an ethic based on “making more stuff,” to one of perhaps “making better lives.” More simply, we will shift from quantity to quality, and gradually learn to adopt quite different behaviors. Instead of increasing usage per person of cheap energy, we know that energy is now economically and climatologically expensive and we must reduce consumption per person while increasing the quality of what we produce.

We have therefore reached the end of the era when people purchased showy products to let their neighbors know how wealthy they were, which we called “conspicuous consumption.” Today we see instead the emergence of “conspicuous non-consumption,” by which we show off our environmental awareness by letting others know how conscientious we can be, and how little we can consume and still live well. And lest you think this change may be years or decades in the future, note that the best selling car in 2013, 2014, and 2015 in California was the fuel and carbon-efficient hybrid Toyota Prius. The change in behavior has perhaps already begun.

An optimist might propose the following chart, comparing the behaviors of phase 2 industrialization

with those of phase 3, the unnamed era into which we are now entering.

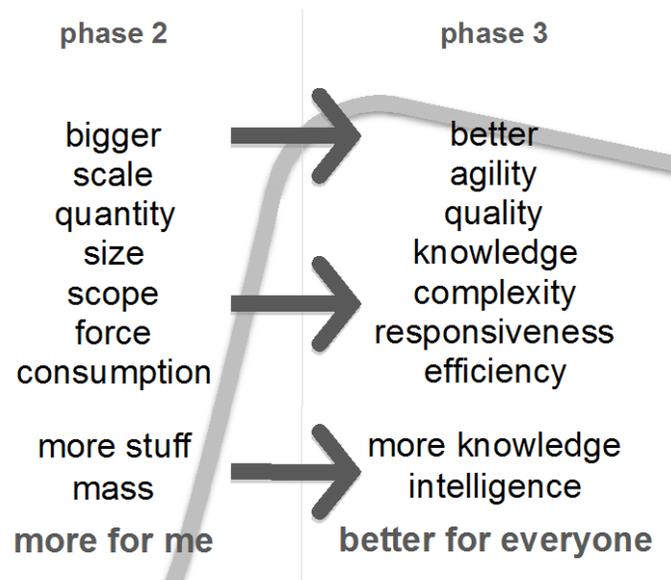


Figure 76. **Phase 2 and Phase 3**

An optimistic view of what might be ahead in Phase 3

The Futurist

The human population explosion that began around 1800 with the advent of industrialism is now winding down of its own accord. It has been, perhaps unexpectedly, a self-limiting process that created urbanization and is now slowing due to the success of urbanization. Ironically, while the population explosion was one of industrialization's greatest outcomes, so also was the city in which the population implosion is now occurring.

The massive wave of economic growth that occurred through the 20th century and which accelerated so significantly in the century's final decades was fueled by billions of young and willing workers who found employment in millions of factories where they produced the goods of the modern world, the excess of abundance that we now find in nearly every corner of the globe.

But with a rapidly declining birth rate, those young and willing workers are turning into middle aged citizens and retirees, and the economic boom they created will be replaced by a much different kind of economy. It's an economy that we certainly don't understand today; in fact, despite the best efforts of a world full of economists, we barely understand the one we have.

The primary threat most countries now face is not too many people but too few young workers, and the fastest-growing segment of the population is, by far, people older than 80^{vii}

The genius of nature is that its method, natural selection, systematically creates a species to fill every conceivable niche in every ecosystem, from single celled life to the giant elephant and blue whale, in

habitats ranging from the crushing depths of the ocean bottoms to the summits of the highest peaks, from the icy poles at northern and southern latitudes to the steamy equator, and now, with humanity's recent adventures into an artificially-created habitat, in orbit 200 miles above the Earth. Our robots, extend civilization onto the moon, mars, asteroids, and now even beyond the boundaries of the solar system.

Each species strives to become ever more fit for its niche, but the challenges arise when the structure of the niche changes. And of course that is exactly what's happening now. In fact the structure of the entire ecosystem is changing, and this applies both to the natural world, since we're literally changing the climate, and to the human economy, since we're shifting into a new economic era.

In the natural world, climate change has instigated the largest mass extinction in millions of years, killing entire forests, but also growing new ones; decimating fertile landscapes and turning them to deserts, but also transforming tundra into usable farmland, killing vast expanses of coral reefs, and drowning entire low-lying island and atoll ecosystems. Nature's mechanism of adaptation, genetic mutation, requires generations to attain results, but this process of Anthropogenic change is occurring within a single generation, thereby exposing the inherent fragility of many species because their excellent adaptation to the niches they occupy turns into over-adaptation when the niche changes fundamentally.

Similarly, the globally dominant economic paradigm of industrialism is being stressed by the changes that are emerging due to its own evolution, which is also exposing its severe fragility and thus its over-adaptation. We are obviously headed for still more severe shocks, toward increased volatility and disorder.

Nassim Taleb has given us a very useful way to think about this:

Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile. Let us call it antifragile. Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better. This property is behind everything that has changed with time: evolution, culture, ideas, revolutions, political systems, technological innovation, cultural and economic success, corporate survival, good recipes, the rise of cities, cultures, legal systems, equatorial forests, bacterial resistance Even our own existence as a species on this planet.^{viii}

Taleb is a commodities trader by profession, from which he has apparently become quite rich, and a very keen observer of society, as a result of which he has become quite famous. He goes on to explain that by pursuing over-adaptation to one particular form of economic life, we have been making the economy *more* fragile; he calls it "fragilizing."^{ix}

When banks collapse due to the excess of ill-considered bad loans; when nations collapse because of factional fragmentation; when ecosystems collapse because of massive over-exploitation, these are all examples of *induced* fragility. Obviously this is the exact opposite of what we ought to be doing.

So while the economists certainly don't have the benefit of Dumbledore's Pensive, the patterns we have identified have enabled us to identify the S-curve that charts the history of the human population, and also tells us that the coming changes constitute significant trends in contemporary history. We currently sit just in the middle of the transition from Phase 2 to Phase 3, on the gently peaking curve that connects the

ascending line of the industrial baby boom to the slowly descending line of the unlabeled era into which we are entering. If, however, we continue to optimize our economic system to reflect the structures and processes suited to Phase 2 then we will experience still more fragility-induced collapses and the accompanying heartbreak and misery. Our challenge, then, is to design systems of economy, management, and decision making that promote anti-fragility while also being well-suited to the Phase 3 world that we are entering.

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^v Sharma, Ruchir. "The Demographics of Stagnation: Why People Matter for Economic Growth." *Foreign Affairs*, March/April 2016.

^{vi} Howard, Emma. "Humans have already used up 2015's supply of Earth's resources." *The Guardian* (UK). August 11, 2015. <http://www.theguardian.com/environment/2015/aug/12/humans-have-already-used-up-2015s-supply-of-earths-resources-analysis>

^{vii} Sharma, Ruchir. "The Demographics of Stagnation: Why People Matter for Economic Growth." *Foreign Affairs*, March/April 2016.

^{viii} Taleb, Nassim Nicholas. *AntiFragile: Things That Gain from Disorder*. Random House, 2012. p. 3.

^{ix} Taleb, Nassim Nicholas. *AntiFragile: Things That Gain from Disorder*. Random House, 2012. p. 5. "We have been fragilizing the economy, our health, political life, education, almost everything ... by suppressing randomness and volatility. ... The process of discovery (or innovation, or technological progress) itself depends on antifragile tinkering, aggressive risk bearing rather than formal education."

Contributing Authors