**The Holistic Historical Evolution of Human Civilization**
**Thomas Lombardo, Ph.D.**

The three-tier division of the evolution of human civilization into the Agricultural, Industrial, and Information Revolutions is a very broad and generalized model of the developmental history of humanity. Moving to a more fine-grained analysis, recorded human history can be parsed into an array of more specific stages and notable changes and events. Although often regional in origin, these important changes and developments, to various degrees, often have had significant global impact. It is important to note that human evolution was ongoing across all regions of the globe. Moreover, advances, innovations, and increasing complexity repeatedly occurred across all major spheres of human existence, including the technological, societal, religious, cultural, economic, agricultural, psychological, and artistic. Providing a more detailed and dramatic overview of the evolution of humanity in recorded history—filled with "sound and fury" and "agony and ecstasy" and victory and defeat—what follows is a chronological summary of a number of such key markers, events, trends, and advances in human evolution over roughly the last five thousand years, with general time periods included.

The *Ancient Period* [1]

- Early advances in metallurgy—the control and manipulation of material substances and basic chemistry leading to improved and/or new tools and instruments—from the Stone Age to the Copper Age (5000 BCE to 3300 BCE)
- The emergence of Sumerian nation states and successive empires (including Sumer, Akkad, Assyria, and Babylon) and the ancient Egyptian empire (3000 to 1000 BCE), involving the construction of the Pyramids and other architectural "wonders of the ancient world;" the first major cities; the evolution of both polytheism and monotheism (the latter through the Egyptian pharaoh Akhenaten); mass slavery and the ongoing deification of royalty (rule through inheritance); the development of astrological (astronomical) consciousness, including the Zodiac and the charting of the paths of the planets ("wanderers"); the invention of papyrus, the sail, the wheel, and the plough; the writing of the archetypal *Epic of Gilgamesh* (including the saga of the "Great Flood"); the creation of Hammurabi's Code of laws; the creation of the first library as a repository of historical records and the ongoing accumulation of human knowledge; and recurrent wars of conquest, expansion, and contraction among these earliest civilizations
- "Animistic Naturalism" as a ubiquitous mode of consciousness (a world full of gods) and the earliest recorded myths explaining the origin of humanity and the earth (probably extending back prior to recorded history but in evidence between 3000 BCE to 1000 BCE)
- Further advances in metallurgy: the emergence of the Bronze Age (3300 BCE to 1200 BCE)

---

[1] See Lombardo, *The Evolution of Future Consciousness*, "Ancient Myth, Religion, and Philosophy" for more detail on this period.

- The beginnings of ancient Chinese (Xia and Shang Dynasties with rule through inheritance) (2100 to 1100 BCE) and Indian (Indus Valley) (2500 to 1900 BCE) civilizations, the latter generating the beginnings of Hinduism (the creation of the *Rigveda* 1900 to 1200 BCE) and the first public sewage and sanitation systems
- The rise and fall of Minoan (ancient Crete) civilization—a hypothesized Goddess-centered religious culture and the first advanced urbanized civilization in Europe—in the Mediterranean; the creation of an extensive trading network; a Bronze Age civilization (2000 to 1100 BCE)
- Moses, the Exodus, and the emergence of the Ten Commandments (ca 1500 to 1400 BCE)
- Continued advances in metallurgy with the emergence of the Iron Age (1300 to 500 BCE)
- The Axial Age of philosophical enlightenment and religious inspiration (800 to 300 BCE) in Europe and Asia, including such key influential figures as Confucius, Buddha, Lao-Tzu, Elijah, Zoroaster (Zarathustra), the Pre-Socratics (Heraclitus, Parmenides, and Empedocles), Socrates, Plato, and the writers of the Upanishads, and the beginnings of many philosophical, religious, and spiritual movements, including Taoism, Zoroastrianism, Buddhism, Platonic Rationalism and Idealism, and Confucianism; Homer and the creation of the *Iliad* and the *Odyssey* (ca. 750 BCE); the beginnings of Western histories in Hesiod and Thucydides; the evolution of the Chinese book of divination the *I Ching* ("Book of Changes") (ca 1000 to 200 BCE)
- Theories of Cyclic, Linear, and Progressive Time in Taoism, Ancient Egypt/ Babylonia, Zoroaster, Hesiod, and later Lucretius
- The ascent of ancient Greek and Hellenistic civilization (700 to 300 BCE) and the beginnings of Western democracy and Western abstract naturalistic philosophy (Aristotle and Democritus), and grounded in Egyptian and Sumerian ideas, the further development of mathematics and geometry (Pythagoras, Euclid, and Archimedes)
- The spread of the ancient Persian Empire (550 to 330 BCE)—the most expansive human empire up to that point in time—which included a number of wars of stalemate with ancient Greek city-states; eventually conquered by Alexander the Great
- The rapidly expanding but short-lived transcontinental empire of the Macedonian Alexander the Great (300 BCE), extending as far as Egypt and India, and involving the spread of ancient Greek ideas into the Middle East and Asia
- The successive Zhou (1000 to 250 BCE) and Han (200 BCE to 200 CE) empires and dynasties in ancient China; the emerging unification of China; and the development of cast iron, the blast furnace, woodblock printing, paper, and the beginnings of the construction of "The Great Wall"

*The Classical and Medieval Periods*

- The rise and fall of the Roman Empire (400 BCE to 450 CE), creating much of the foundation and heritage for later European civilization, including major advances in law, justice, warfare, and engineering

- The rise of Christianity in the Middle East and Europe beginning with Jesus Christ, Paul, and within the Roman Empire and solidifying in power and influence with the emperor Constantine, the Council of Nicaea, and the creation of the New Testament (modern Christian Bible) (50 CE to 350 CE)
- The rise and fall of the vast Gupta (300 to 500 CE) Indian Empire; the invention of chess
- The emergence of various Mesoamerican and South American civilizations (Olmec, Zapotec, Teotihuacan, Maya, Toltec, Aztec, and Inca) (1500 BCE to 1500 CE) and their eventual demise as a result of the European conquest of the Americas
- Christianity splits into Eastern and Western Holy Empires; the rise and fall of the Christian Byzantine Empire (Eastern Holy Roman Empire); the creation of Constantinople (the "New Rome"); Byzantine Empire involved in numerous wars of defense and conquest, eventually conquered by the Ottoman Empire (300 to 1450)
- The T'ang (600 to 900) and Song (950 to 1280) empires and dynasties in China; the invention of porcelain, gunpowder, fireworks, rockets, bombs, and bank notes
- The European "Dark Ages;" the rise of Feudalism (lords and peasants) as a system of governance and social order; the first Western university established (1080); the emergence of the "Age of Chivalry" (knighthood and chivalric codes); the preservation of classical and ancient knowledge within monasteries; and the continuation of the Roman Papacy and the Western Christian Holy Roman Empire (Charlemagne crowned Emperor in 800) (400 to 1300)
- Beginning with Mohammed and the creation of the sacred text the *Koran*, the spread of the Islamic Empire (600 to 1250) across the Middle East and northern Africa, producing many scientific and mathematical advances, while also rediscovering and preserving ancient Greek philosophy, science, and mathematics
- Under the leadership of Genghis Khan, the Mongol conquest of China and much of Asia, producing the most expansive empire in human history (1200 to 1300)—the revenge of the nomads
- The multiple European Christian Crusades against Islam in the Middle East (1100 to 1300), in general fought to a stalemate
- The rise to supremacy of Scholastic theology and philosophy in Europe (St. Thomas Aquinas) involving an attempted synthesis of Aristotle's philosophy and Christian thinking (of reason and faith) (1200-1300)
- The Black Death (ca 1350), the worst pandemic in human history, killing half of the population of Eurasia

*The Emergence and Development of the Modern Era*[2]

- The rediscovery of classical culture, philosophy, science, and art (Greco-Roman) in Europe, the rise of Humanism (Erasmus), the writing of Dante's *Divine Comedy*, and the emergence of the European Renaissance in the arts and humanities; the discovery of perspective and multiple scientific-technological-artistic advances of Roger Bacon and Leonardo da Vinci (1250 to 1500)

---

[2] See Lombardo, *The Evolution of Future Consciousness*, "Science, Enlightenment, Progress, and Evolution" for more detail on this period.

- The Ming (1370 to 1650) and Qing (1630 to 1910) Chinese dynasties and empires, involving an immense number of technological inventions, cultural innovations, and enormous population growth; the world's largest economy by 1600.
- The development in Europe (origins in China) of the printing press (Gutenberg) leading to the mass production and distribution of books and steadily increasing literacy in the general population (1450-1500)
- The Christian Reformation (Luther and the Protestant Revolution) (1500 to 1600), ending the dominance of the Catholic Church in Christianity and the splintering of Christianity, followed by numerous Catholic-Protestant wars
- The rise, dominance, and fall of the Ottoman Turkish Empire (1300 to 1920), across the Middle East, North Africa, and the Eastern Mediterranean
- The beginnings of the Modern Era in Europe, but eventually spreading across the globe, involving multiple social-cultural and scientific-technological transformations (1500 to 1600)
- The Age of Exploration, including the first circumnavigation of the globe, the European "discovery," conquest, and settling of the Americas—the decimation of indigenous American peoples and cultures—and the beginnings of a globally pervasive system of trade and European Colonialism across the world (1500 to 1800)
- The Copernican (the Heliocentric Theory of the Solar System) and Scientific Revolutions (Kepler and Newton's Naturalistic Mathematical Laws) (1500 to 1700) (a profound transformation in human conscious understanding of the universe); the invention of the telescope, compound microscope, mechanical calculator, and barometer
- The rise and fall of the Mughal (1500 to 1850) Indian Empire, involving the unification of much of the Indian sub-continent under a Muslim dynastic rule over a predominately Hindu population; huge population growth; many cultural and architectural advances including the creation of the Taj Mahal, and by 1700 the world's largest economy
- The rise of modern secular Western philosophy (Descartes, Spinoza, Hobbes, and Locke); a breaking free of the intellectual authority of the Catholic Church and Judeo-Christian thinking (1630 to 1700)
- The European Enlightenment (1700 to 1800) (Voltaire, Hume, and Condorcet), proclaiming the supremacy of reason and science over royalty and superstition, and the value of individual determination over the dictates of royalty and religion; the modern origins of the idea of secular progress, replacing religious visions of the positive possibilities of the future
- The American Revolutions (North and South America), coupled with the continued conquest of indigenous American peoples (1600 to 1880)
- The selective spread of Democracy (rule and governance through elections) to certain populations and countries and the ongoing war against human slavery and human inequality; the American Civil War (1800 to the present)
- The Industrial Revolution (1760-1840): An accelerating rate of inventions and diverse techno-industrial innovations spreading from Europe to the United States and eventually across the world, including the steam engine and steamboats, railroads, the air compressor, manned hot air balloons, the camera and photography,

the cotton gin, sewing machine, internal combustion engine, mechanical computer, electric motor, and the modern factory; a significant and pervasive transformation in human life

- The Evolution of Modern Medicine (1800-1900): Anesthetics, antiseptic surgery, germ theory of disease, first vaccines, stethoscope, blood transfusions, X-Rays, aspirin; average human life expectancy slowly increases
- The rise of Capitalism and Corporate Capitalism and Counter-Reactions (1800 to the present) (Adam Smith as modern formulator of Capitalism) as dominant economic theories and systems for organizing the world economy; the rise of mass production and regimented repetitious jobs and vocations (the creation of the assembly line); coupled with ongoing critiques of capitalism and industrialization as a equitable and just forms of economy and fulfilling ways of life (Karl Marx and others)
- The Age of Romanticism in art, literature, and philosophy (ca.1800) as a reaction against industrialization and rationalism
- The emergence, development, and increasing influence of the theory of evolution, encompassing geology, biology, astrophysics, and other scientific disciplines; Charles Darwin and the publication of *The Origin of Species* and *The Descent of Man* (1800 to the present); a second wave of conflict between Western religion and Western science
- The Electrification of the Globe: Beginning with multiple scientific discoveries and its first applications in the late eighteenth century, and continuing into subsequent centuries, the science and technology of electricity transforms the modern world, powering many new emerging technologies and working its way into numerous aspects of the modern city and the modern home (1800 to the present)
- The Age of Invention Continues (1850 to 1910) including many new electrical devices, but encompassing a wide range of inventions including the dirigible, color photography, the modern skyscraper (transforming the skyline of cities), plastics, the refrigerator, rechargeable battery, phonograph, automobile, telephone, incandescent light bulb and commercial large scale electrical lighting, telegraph, wireless radio communication, airplane, and the television; everyday life is significantly altered through mass produced commercialized technological inventions

*The Last Century and Contemporary Times*

- Along multiple measures, cultural, social, environmental, economic, and technological, the most transformative century in recorded human history[3]
- The rise of American economic, cultural, and military global dominance (1900 to the present)
- A Second Scientific Revolution, transcending the ideas of Newton, with the development of the theories of relativity and quantum physics; the discovery of the

[3] See Thomas Lombardo *Contemporary Futurist Thought*, Chapter 3; also see "Contemporary Trends and Theories and Paradigms of the Future": https://www.centerforfutureconsciousness.com/cont_trends_video.htm for a more detailed listing and description of trends over the last century and especially the last few decades.

sub-atomic realm; Hubble's discovery of the ongoing expansion of the universe and the formulation of the Big Bang Theory of the origin of the universe (1900 to 1950)

- Ongoing continued technological inventions (1910 to the present), including the military tank, liquid fueled rocket, electron microscope, nylon and polyester, transistor, video game, laser, and cell phone, in many ways further reinforcing a consumerist way of life for modern humanity
- Ongoing Advances in Medicine throughout the Century: Average human life expectancy significantly increases; discovery of penicillin, many vaccines, ECG, ultrasound, DNA and modern genetics research, pacemaker, organ transplants, CAT scans, test tube babies, and clones; ongoing successive reduction and eradication of many diseases; continued challenges, although with significant improvement, with equitable global access to modern medicine and health care; significant increase in the use of drugs and medication to address most health issues (a drug culture); a growing obesity epidemic (1900 to the present)
- The Russian Revolution and Soviet Expansionism (1915 to 1990); the rise of Communism as a dominant political, social, and economic philosophy across the globe
- The Roaring Twenties and the Great Depression (1920 through the 1930s), involving a colossal swing from cultural liberalism and exuberance to cultural despair, conservatism, and psychological hopelessness, and including the beginnings of pop music and notably blues and jazz
- The revolutionary development of modern art, music, and architecture (Stravinsky, Picasso, Dali, Wright), challenging many of the aesthetic ideals of previous times (1890 and ongoing)
- The emergence and ongoing tremendous growth of giant global corporations and international systems of finance and banking, furthering the evolution of a global economy and producing economically-financially based centers of social and cultural power, eventually rivaling, if not exceeding, the power of nations (1900 to the present)
- World Wars I and II, the most destructive and globally expansive wars in human history, the rise of Fascism and modern political dictators, and the invention of nuclear weapons, empowering humanity the technological capacity to destroy civilization (1915 to 1945)
- The progressive/ongoing undoing of European colonialism in Africa and Asia (post 1945)
- The rise of Communist China (post 1945) and the industrialization and modernization of China (post 1980), eventually transforming the country into one of the dominant economic-political powers in the world
- The systematic killing of tens of millions of national citizens by authoritarian governments and dictatorships (Nazi Germany, Stalinist Soviet Union, and Communist China) (1935 through 1980)
- The Cold War (between NATO and the Soviet Union) and the threat of a nuclear Armageddon and the end of human civilization (1945 to 1990)
- The successive formation of the League of Nations and the United Nations (1920 to the present) as efforts to peacefully and cooperatively unite humanity

- As a continuation of Western individualist philosophy, the emergence of Postmodernism and Existentialism (1945 to the present), challenging all systems of unifying social order and universal principles and values
- The Age of Mass Media (1920 to the present) beginning with newspapers and magazines, and moving to the radio, cinema, the TV, the Internet, and social media.
- The Information Age and the rise of computers, the Internet, the World Wide Web, laptops, “smart phones,” Google, virtual reality, and globalizing techno-media (1945 to the present); vocations and professions move from factories to information management and human services
- Growing global affluence (“The Age of Affluence”) and the spread and growth of a consumerist society; according to some indicators the ongoing decline of (percentage of) poverty and malnourishment throughout the world
- Human rights and social justice movements across the globe, including the modern rise of feminist philosophy; continued critiques of social and economic inequality throughout the world (1900 to the present)
- The colossal growth of incredible financial wealth (mega-billionaires) within a small percentage of the human population
- The immense growth and spread of globalizing pop culture, including the cinema and movie stars, radio, jazz, and Big Band music, Rock ’n Roll, TV and TV stars, rapid and repeated changes in modern clothing styles, legal and illegal drug use, pervasive consumerism, and increasingly more liberal values; the Beat Generation, the Hippies, the Sexual Revolution, the New Age, Disco, Punk, Rap, and Gothic (1920 to the present)
- The “Age of Anxiety,” speed, and stress, and the proliferation of dystopian visions of the future and “doomsday thinking” (1910 to the present); the emergence and popularization of modern science fiction (Wells, Gernsback, Heinlein, Asimov, and Clarke) spreading from literature into the cinema; the pervasive spread across the globe of science fiction images of the future (especially through the cinema), both uplifting and depressive (*Star Wars* and Cyberpunk)
- The ongoing clash of traditionalism and progressivism (the old and the new); the rise of evangelical and fundamentalist Christianity and culture wars in the United States; fundamentalism versus transformation in the Middle East; and the ongoing global clash between stability and the idealized past versus growth, evolution, and change
- The Space Race and ongoing space exploration and the evolution of space technologies, including landing on the moon and the proliferation of orbiting communication and surveillance satellites (1950 to the present)
- Modernization, hi-tech, industry, and rapid economic growth spread across East and South Asia, South America, and areas of the Middle East; a new wave in the construction of ever-ascending, record-breaking skyscrapers spreads across Asia and the Middle East (1950 to the present)
- Ongoing inter-cultural tensions and numerous local conflicts across many parts of the globe, including the Middle East, Southeast Asia, sub-Saharan Africa, Central and South America, and Eastern Europe (1945 to the present)
- The rise of Environmentalism and the Return to Nature movement (ca 1960 to the present); growing concerns and debate over climate change, global warming, and the emerging next mass extinction of species on the earth

- As a continuation and further amplification of nineteenth century debate, the ongoing argument over whether humanity (modern human civilization) is progressing or declining; the clash of optimism versus pessimism over the future; critiques of economic and technological measures of the quality of human life and the nature of progress[4]

**Major Evolutionary Trends and Developments in Human History**

As a way to summarize many of the events, trends, and advances identified above, included below are a number of the major transformations that have occurred within human evolution during recorded history (3000 BCE to the present).

- *The Ongoing Rise and Fall of Empires*: Throughout recorded history, since its beginnings, humans have organized together socially, culturally, and politically into "empires," which grow and spread frequently through wars of conquest, and then invariably decline, often due to the military conquest by other newly emerging empires. No human empire has been absolutely permanent, although the numerous cultural and technological creations of empires and their distinctive civilizations are to a great degree passed on and bequeathed to later civilizations. Regions may have successive emerging empires, such as in China, India, Mesopotamia, Mesoamerica, and Europe, but no single empire has persisted indefinitely within any of these regions. Human recorded history is an ongoing oscillation and transformational flux of social integration (the creation of order and relative peace) and social disintegration (chaos and destruction), punctuated with repeated wars of conquest.

- *Population Growth*: One of the most significant and noticeable trends throughout recorded human history is that the human population on the earth has colossally increased from roughly 15 million to 8 billion over the last 5000 years; there are over 500 times as many people today than at the beginnings of human civilization. There are many factors contributing to this incredible growth, such as modern medicine, health care, and food production, and there are many different estimates regarding the future of human population growth. Growth may level off; it may not; the human population could plummet due to one or more natural or man-made disasters. One thing is clear though: This massive increase in population up to this point in time has deeply impacted the environmental conditions of the earth. Moreover, such huge numbers of people have pushed our societies toward ever-increasing levels of complexity—of construction, coordination, production, and distribution—to support these populations. Also, increasing population has significantly affected the quality and nature of individual lives; living in a world of 8 billion is much different than living in a world of 15 million.

- *Urbanization*: As noted earlier, since the beginnings of recorded history, the human population on the earth has been transforming from a nomadic and rural type of

[4] Lombardo, *Contemporary Futurist Thought*, Chapter 4.

existence to an urban and relatively sedentary existence. (There is still significant movement going on within the human population—of migration, emigration, and immigration—but the flow is mostly from one city to another or from rural to urban settings.) The huge ongoing growth of the human population is taking place within our ever-growing and proliferating mega-cities; the biggest cities of today dwarf the biggest cities of yesterday. In general, living in a big city is vastly different than living in a rural environment. For the vast bulk of humanity, we are urban and urbanized in our lifestyles and states of consciousness.

Urbanization allows for increasing specialization and complexity within human life. In general, urban inhabitants are much more specialized and limited in life skills than rural inhabitants. Also, there are vastly more diverse forms of stimulation and opportunities of actions afforded in cities than in rural areas. Cities are convergent points for trade and exchange, and thus give its inhabitants access to diverse products and ideas originating from numerous other locations across the globe; one can find the entire global reality of humanity within a big city.

- *Globalization*: A distinctive feature of humanity is that we are a global and globalizing species. Although our origins are local, beginning in Africa, before the start of recorded history we migrated and spread across most of the entire globe; indeed our hominid ancestors on a number of occasions spread out of Africa across Europe and Asia. Further, although we created relatively localized settlements during the Stone Age, we participated in trade and forms of communication across local regions that extended outwards at least hundreds of miles. With the emergence of cities and empires our inter-connectivity grew and expanded further, whether through trade, cultural exchange, or military conquest. The empires of the ancient world traded and interacted across continents.

  Beginning with the Age of European Exploration, the entire global human population was progressively interconnected through conquest, trade, cultural exchange, and colonization. As technology and forms of communication continued to evolve, the economies of the world were progressively more knit together into intricate webs of interdependency. A world economy emerged; a world communication web emerged. Less and less of the total human population existed outside of this global human network. Throughout the last few centuries, in part as a continuation of the trend toward empire building in the earlier past, various powerful nations or conglomerates of nations (the British Empire, Nazi Germany, Communist/ Soviet Block, and the United States) have extended outward in their reach of influence and control, with aspirations (both implicit and explicit) to assimilate huge areas, or the world as a whole into a single world civilization. Efforts may be peaceful and relatively democratic in philosophy, such as in the United Nations, but humanity continues to express this tendency or drive toward creating a global civilization. As throughout history, there are counter-reactions (regional and otherwise) to expanding empires and efforts to globally organize humanity, but the overall trend within recorded history is the ongoing growth and evolution of an intricate, highly independent global network of all of humanity.

- *The Accelerative Growth of Economic Production and Consumption*: There is a huge amount of evidence for trade and exchange among prehistoric humans. Although recorded human history may highlight the rise and fall of great nations and empires, of innumerable wars and waves of conquest, or the advancement of tools, artifacts, technologies, and machines, one central dimension of the evolution of complexity in human life is the incredible growth and diversity of economic production and consumption. Modern humans make things, sell things, buy things, and use and consume things on a scale that dwarfs similar activities in ancient human civilizations; in fact, the economic growth of the world since the beginnings of the Industrial Age has been profoundly exponential. The technology of our economy, the global system of distribution, and the international and corporate coordination of all features of the economy is massively complex, drawing ever increasing huge amounts of energy and resources into its operations, evidently deeply affecting our environment. The world economy also impacts individual humans in many ways, and for each of us individually our daily concerns and activities and main priorities in life greatly focus on economic issues, challenges, and goals.

- *The Growth of Science, Technology, and Human Knowledge*: Beginning with the ongoing accumulation of written records, aphorisms, and observations on life in the first human civilizations—if not before if we include the oral transmission and preservation of ideas and information across generations—human knowledge has been growing along multiple dimensions. Scientific, technological, and mathematical discoveries, in particular, go back to the beginnings of recorded history, and such discoveries recorded in print were passed on to later generations and subsequent civilizations (with a certain amount of destruction and loss) (for example, from ancient Egypt and Mesopotamia to ancient Greece; from ancient Greece to Rome and to the Islamic empire; and from the Islamic empire to early modern Europe). But with the beginnings of the Scientific Revolution and the modern mass printing of books, the progressive accumulation of scientific and technological knowledge has especially and rapidly accelerated. Even though there have been multiple scientific revolutions, involving the reinterpretation if not rejection of past ideas—our recorded beliefs include many mistakes and superstitions—the overall direction has been an exponential and unequivocal progressive cumulative growth in scientific and technological knowledge since the sixteenth and seventeenth centuries.

  It could be argued that many of the other major trends in recorded history are a result of the ongoing growth and societal impact of advances in scientific knowledge and emerging new technologies; modern science and technology have empowered humanity to dramatically transform the world and human life. Our economy is powered by and infused with technological creations, as are our modern cities and homes. Scientific knowledge and modern technologies have been applied to human health, nutrition, food production, and medicine, greatly extending the average human life span. It could be argued that the progressive advances in science and technology are a mixed blessing, for science and technology empower progress in both medicine and warfare.

- *The Evolving Human Impact and Management of the Environment*: The Anthropocene Era is defined as that geological period within the earth's history—from twelve thousand years ago to the present—during which time a single species, namely Homo sapiens, began to exert a pervasive and significant impact on all aspects of the environment of the earth. But this global impact of humanity on the earth has considerably amplified since the beginnings of human civilization and has especially become more pronounced in the Modern Era, notably with the emergence of the Industrial Revolution.

  The environment has been progressively transformed with the growth of agriculture; the spread of human settlements have steadily pushed back and eliminated the habitats of other life forms; our growing economy serving larger and larger human populations has increasingly drawn upon many natural resources and materials; as our economy grows more and more waste products are generated and more and more pollutants and other materials are released into the atmosphere and into both bodies of fresh and salt water; we light the night sky and broadcast an unending cacophony of sounds into the surroundings. In general, what we describe as the "wilderness" has been shrinking to the point where some level and form of human presence exists almost everywhere on the earth.

  In many respects, the environment that contemporary humans live in is not the same environment that our prehistoric ancestors lived in. And although to some notable degree the environmental effects created by human civilization are accidental and not guided by foresight or anticipation—the phenomenon of "unintended consequences"—to a great extent humanity has intentionally reshaped and evolved the environment to suit our purposes and needs. For better or worse, and that is a point of considerable contemporary debate, humanity during the Anthropocene Era has been purposefully evolving the environment of the earth. A central question of our era is whether we are biting the hand that feeds us, to the point where we will destroy the foundations of human civilization—our earthly resources and areas of habitation— producing a monumental collapse in modern civilization. There is concern, even, over our potential extinction.

  This ongoing transformation of the environment occurring as a consequence of the growth of human civilization across the globe has become a significant issue and point of tension and philosophical conflict, especially over the last century. But as integral to our growing presence and impact across the globe, humanity is increasingly involved in pervasive environmental management. Even our remaining areas of wilderness are managed and protected. Although humanity and nature have never been separate realities—contrary to dualistic philosophies—nature in contemporary times has become a reality infused with the creations of the human mind and our technologies.

- *The Evolving Complexity of Human Life*: As introduced in the previous chapter, the direction of evolution at both a cosmic and earthly level is toward increasing complexity. Various measurements appear to indicate that the amount of information and information processing on the earth, specifically localized in human existence, has been exponentially increasing, especially since the rise of human civilizations and the subsequent emergence of the Modern Era. Knowledge keeps accumulating;

technologies keep advancing; the deluge of news and messages converging on our minds keeps growing; our everyday ways of life keep getting more complicated. As such, although knowledge empowers and new technologies amplify our abilities, the overall effect, as identified in the above chronology of trends and milestones, seems to be the generation of increasing stress and anxiety in human life. The futurist Alvin Toffler argued that we are suffering from “future shock,” as the future keeps coming at us faster and faster; the contemporary writer Daniel Rushkoff, not to be outdone, has more recently argued that we are suffering from “present shock,” unable to even keep up with the ever-demanding present. James Gleick simply states that “everything is accelerating;” we live in an era of speed and compression in order to maximize the amount of information contained in the moment and delivered to our minds.

A significant consequence of increasing complexity, speed, and information overload is increased psychological uncertainty. Perhaps human civilization is going to collapse due to one of a number of different looming “existential risks” facing us? Perhaps a more advanced form of life and mentality needs to emerge to competently handle the complexities and challenges of contemporary life? (H. G. Wells seriously considered this possibility.) Perhaps computers, as predicted by Ray Kurzweil, will soon exceed human intelligence, and perhaps, as envisioned in science fiction stories, computer minds will replace human minds as the dominant form of existence on the earth? Is this a good thing, or a bad thing?

All in all, as a consequence of the accelerative evolution of complexity in contemporary human civilization and the ever-growing impact of human civilization on our environment and our conscious minds, many of us feel anxious and uncertain about the “shape of things to come;” many feel pessimistic and nihilistic. Others, such as the transhumanists, are more optimistic, believing that the scientific knowledge and technologies needed for the further evolution of our species are being progressively developed and implemented as we speed forward into the future. This age of increasing complexity, having its origins in the overall evolutionary thrust of the cosmos, and the unique expressions of human evolution, has generated both optimism and pessimism—of hope and fear—over the uncertain trajectory of humanity.

From an informed historical and scientific perspective this ambivalence over the future is justifiable since evolution is not smooth and steady, or certain and entirely predictable in its creations and directional trends in time.

* * *

The events and transformations in human history summarized above include cultural, political, economic, technological, philosophical, religious, environmental, and psychological elements; our evolution has multi-dimensional, with all dimensions of human existence evolving in complex patterns of interaction and influence. I use the expression “evolution” in describing this multi-dimensional transformation, since all the constituent developments build upon our foundational and pre-civilizational evolutionary history; as noted earlier, the cultural, psychological, and technological are advanced forms of evolution, that is, evolutions in evolution.

Even if such evolutionary developments to significant degrees have been purposefully initiated, as noted above, purposeful evolution is an advanced expression of the general cosmic phenomenon of evolution. We have been active participants in the creation of our evolutionary history.

Moreover, even if within human history there is a good deal of destruction, of becoming and passing away, of chaos mixed with order—as evidenced in the summary provided above—the whole process can rightly still be viewed as evolutionary; as noted earlier, evolution is not smooth and steady, and there is a good deal of death, extinction, and collapse mixed into the ongoing evolution of complexity. Even given all the mayhem identified in the above historical summary, the overall thrust has been toward increasing complexity in human existence, and for both better and worse, increasing human empowerment within our world.