



The Enlightenment



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Sapiens: A Brief History of Humankind - *By Yuval Noah Harari*

A Book Review by Don Hatch – Presented at the January 10th HALA Meeting

This book is divided into four sections:

- The Cognitive Revolution
- The Agricultural Revolution
- The Unification of Humankind
- The Scientific Revolution

In just a little over four hundred pages, Harari concisely describes the evolution and exploits of Homo sapiens, the “wise human.” As an aid to emphasizing the relatively brief time that humans have existed during the vast scale of geological time, there is a helpful table at the outset outlining the “Timeline of History.” Living organisms first appeared 3.8 billion years ago, but Homo sapiens did not begin to evolve until about 200,000 years ago, a mere 0.0053% of the time organic life has existed on earth. Furthermore, it was only 70,000 years ago that Homo sapiens developed a fictive language and the Cognitive Revolution began. And it is only 10,000 years since the Agricultural Revolution appeared, and only 500 years since the Scientific Revolution commenced. In that relatively short 500 years, a period now often referred to as the Anthropocene, humankind has gradually acquired the knowledge and means to influence events and conditions on our entire fragile home for better or for worse, raising the question; do we have the means and the will to ensure that our descendants will inherit a healthy and peaceful environment? This is the challenge we now face, but back to the book, which is mostly about the past.

The Cognitive Revolution

In 1856 in Germany, the remains of a species of Homo that was not Sapiens, was discovered. The specimen was dubbed Homo neanderthalensis, after the Neander Valley in which it was found. This species evolved about 500,000 years ago, living in Europe and western Asia. Neanderthals became extinct about 30-40,000 years ago. In more recent times other non-sapiens have been discovered. They include Homo erectus from eastern Asia, Homo soloensis from Java, Homo floresiensis (the hobbit) from Flores in Indonesia, Homo denisova from Siberia, Homo rudolfensis from east Africa and Homo Naledi from South Africa. All of these species became extinct, but did any interbreeding with sapiens occur before the

extinction? We don't know about the others, but it is virtually certain there was some interbreeding with Neanderthals. There are humans alive today with up to 4% of their DNA from Neanderthals.

Why did Sapiens survive while others did not? Apparently Sapiens brains were superior, having cognitive abilities like learning, remembering and communicating as a result of; "an accidental genetic mutation that changed the inner wirings of Sapiens brains, enabling them to think in unprecedented ways and to communicate using a comprehensive language." The occurrences between 70,000 and 30,000 years ago constitute the Cognitive Revolution as the human mind acquired the ability to imagine and invent items such as boats, oil lamps, bows and arrows and needles. These were the times of the hunter-gatherers, who lived in small groups and it has been speculated by some, that those hunter-gatherers who were able to obtain sufficient food clothing and shelter, were the happiest humans of all time. In any event, all this changed with the advent of the Agricultural Revolution beginning about 12,000 years ago.

The Agricultural Revolution

The first chapter of the agricultural revolution section is entitled "History's Biggest Fraud," because as Harari claims, "it translated into a population explosion and pampered elites. The average farmer worked harder than the average forager and got a worse diet in return." And it has been suggested that the advent of farming increased the amount of violence on earth as disputes arose over the ownership of land.

Through the domestication of a few plants including wheat, rice, corn, potatoes, millet, barley, peas, lentils, olives, and grapes, and a few animals including goats, sheep, cows, horses, camels, pigs and chickens, the agricultural revolution got underway about 10,000 years ago. Along with farming came the existence of villages, towns and cities and the need for recording inventories of grains as well as need for maintaining law and order. By 3000 BCE, the Sumerians in southern Mesopotamia had invented a system of writing and numbers. The earliest recorded document outlining rules of law and order was the Code of Hammurabi created around 1776 BCE. Trade and commerce was greatly assisted by the invention of coinage, but this did not occur until the 7th century BCE. For hundreds of years farming consisted of hours of toil, planting, tending to and harvesting crops, assisted by oxen and later horses. Most of the labour was provided by peasants who were subject to the whims of landowners and even kings in times of war.

It was not until the mid-1800s that a second Agricultural Revolution began to occur as farm machinery lessened the need for human muscle power and tractors gradually replaced oxen and horses.

The Unification of Humankind

Homo sapiens evolved to think of people as 'us' and 'them.' Us were the people in our valley, them were the people beyond and communication with them was often limited. But during the first millennium BCE, three potentially universal orders that started humanity on a journey toward an eventual world order and globalization began to appear. The first to appear was economic: the monetary order. The second was political: the imperial order. The third was religion; the establishment of universal religions such as Judaism, Hinduism, and Buddhism, followed by Christianity and Islam.

Economics

Trade between individuals in a community and between those in other communities most probably began with bartering. But as time went on, the need for some type of monetary exchange or money became

apparent. Various items such as shells, skins, salt, grain, cloth and promissory notes were used as currency, but coinage and bank notes of a stated value eventually became the universal norm. The establishment of banks and exchange rates between national currencies became a significant factor in furthering the unification of humankind.

Political

Imperial visions also furthered the unification of humankind. There were various older empires, including Assyrian, Babylonian, Persian, Greek, Roman, and Holy Roman as well as Chinese dynasties and ancient empires in central and south America. Modern empires, including British, Spanish, Portuguese, German, Dutch and Belgium, consisted largely of colonies scattered around the world. Although empires were often founded on war and blood, and rulers benefited from the spoils of conquest, they did help to foster the bringing of more people together. But in modern times empires proved expensive to maintain and most former colonies have now gained independence, some for better, some for worse. Globalization with its many challenges, not empire building, is now the norm bringing increasing unification.

Religion

Religion was the third great unifier of humankind, along with money and empires. Religions assert that our laws are not the result of human caprice, but are ordained by an absolute and supreme authority. This helps place at least some fundamental laws beyond challenge, thereby ensuring social stability. Religion can thus be defined as a system of human norms and values that is founded on a belief in a superhuman order.

All religions whether they be the polytheism of Greece and Rome, the monotheistic religions of Judaism, Christianity and Islam, or Hinduism and Buddhism of the east, tended to have a unifying effect over wide geographical areas, thus providing a semblance of overall unification, but on the other hand, within religions, particularly Christianity, various denominations and sects, each with its own variations have unfortunately evolved to reduce unity and even cause wars.

Of particular interest to the Western and near-East worlds are Christianity and Islam. How did these offshoots of Monotheistic Judaism become so dominate? Why and how did they supplant the secular life styles of Greece and Rome? A most interesting question, but a subject for another essay or presentation or book. Suffice to say, fortunately Christianity went through a beneficial reformation, but unfortunately, Islam is still badly in need of reform. Harari's comment on this situation is: "it may well be that we'd all be better off if Christianity and Islam had been forgotten or defeated." I couldn't agree more!

In the section on religions, Harari includes an interesting conception of humanism which he considers to be a revolutionary new creed that conquered the world during the last few centuries. This is not about today's card-carrying members of Humanist organizations (these organizations are never mentioned in the book) but instead humanism in an overall secular sense of living without God. Prior to 1500 and the Protestant Reformation, religion and God played an important role in the lives of most Westerners. But after 1500, northern Europe began a slow march toward less religion and more secularism with increasing concern about the welfare and actions of individual humans and diminishing concern about God. Harari posits three kinds of humanism in societies embracing increasing secularism and waning religiosity.

- **Liberal humanism** – Humanity is a conglomeration of individual humans, and the liberty of each individual is sacrosanct. This is the form of humanism in most western secular democracies.

- Socialist humanism – Humanity is collective rather than individualistic, the whole species is sacrosanct. This is the form of humanism in most communist countries.
- Evolutionary humanism – Evolution has made one race superior to all the rest. This was the contention of the Aryan Nazis. For many years after World War II, evolutionary humanism went out of favour, but unfortunately has recently re-emerged among white supremacists in the U.S.

Liberal humanism, wherein humans no longer look to God and holy scripture for guidance but rely on themselves to look for meaning in this life, won over the other two in the last half of the twentieth century in most Western countries. The United States where God is still prominent in the picture is an exception.

The Scientific Revolution

The early modern scientists, Copernicus, Kepler, Galileo and Newton, were astronomers who established once and for all that our planetary system was heliocentric, not geocentric. Newton, one of the greatest scientists who ever lived, also set out the laws of motion and gravity in mathematical terms. And since those earlier times, technologists, inventors and industrialists have taken the fruits of scientific discoveries and turned them into products and services that have radically changed the way we live. For example, medical scientists have made great strides resulting in reductions of the occurrences of many infectious diseases as well as extending the life expectancy of humans to an average close to ninety. And we must recognize the special place of inventors in this mix. It is the devices they invented that brought about the contrivances that significantly changed our lives. The printing press, the steam engine, the telegraph, the telephone, dynamite, electric power, the light bulb, the phonograph, the flush toilet, the internal combustion engine, the automobile, the airplane, the radio, the motion picture camera, television, the internet, the PC and the smart phone. And I should mention that with all these devices we have become spenders and consumers, egged on by the materialistic advertising industry. Yes, the progress has been great, but we must not forget that humans have also used the fruits of scientists, inventors, technologists and industrialists, to develop increasingly destructive instruments of war and the means to destroy humankind. Not so great!

Of course, none of the above could have taken place without a functioning economy with services such as banking, a stock market, and perhaps most importantly, educational institutions. (Without doubt, the introduction of free elementary and secondary education played a major role in bringing about progress). It was in 1776 that the economist Adam Smith published his famous book, *The Wealth of Nations* in which he proposed that a nation's wealth should be measured not only by the amount of gold in its coffers, but also by its ability to create wealth through its production of goods and services. From Smith's time onward, the ancient mercantile system was gradually replaced in the western world by the capitalist system which up until recently, served our economy reasonably well. Industrialists normally invested some of their profits to expand their business, thereby creating more jobs amid a growing economy.

Unfortunately, however, financial greed has now got in the way as financiers designed securities to create profits and wealth for themselves, rather than using their money to create more jobs for the middle-class. The net result was the financial crisis of 2008. The world is still trying to recover, but fortunately, Canada, because of stricter banking regulations, was spared much of the turmoil.

Overarching all the developments described above, at least in the West, has been an evolving system of democratic governments, both parliamentary and republic. By and large democracy has served most western countries and their citizens quite favourably, but recently, particularly in the United States, big business and big finance has gained undesirable selfish influence in government at the expense of the middle class. How this situation ends remains to be seen. (As an aside, it is probably not too much of a stretch to state that with its current President, the United States has a big problem). So, has democracy outlived its usefulness? Is a better system possible now that we are entering the Digital Revolution? These questions are being asked.

The penultimate chapter asks the question: After all the developments of the last 500 years, are people happier now than in previous times? Surveys have been created to find where the happiest people reside and results indicate that the happiest people live in liberal humanist secular democracies. Certainly, many are happier now than in past times, but inequalities have caused others to be less happy.

The last chapter of the book is pessimistically entitled "The End of Homo Sapiens." Would it be beneficial to the ecosystem if Sapiens disappeared? "After all," Harari says, "Sapiens has produced little to be proud of. We are still as irresponsible as ever. We are accountable to no one. We are wrecking havoc on our fellow animals and on the surrounding ecosystem, seeking little more than our own comfort and amusement, yet never finding satisfaction." So, will phenomena such as artificial intelligence and genetic engineering alter the nature of Homo sapiens and create a new better form of Homo? A Homo Deus? What the future may hold is the topic of Harari's most recent book, *Homo Deus: A brief history of tomorrow*. Will humans become godlike? This is the question Harari asks. While admitting no one can accurately forecast the future, he seems to suggest the answer might be yes. This is scary stuff and presents a challenge for homo sapiens to get their act together or become extinct like the Neanderthals. A review of Homo Deus by Margit Alm begins on page 6.

So, what are the key points to be learned from the book?

- Sapiens is not the only species of the genus homo that has existed on earth. Several others evolved and gradually became extinct.
- The species Homo sapiens has existed for only about 200,000 years on earth, a mere blip in geological time. It is only in the last 70,000 years that the sapiens brain acquired the make-up it now has during the Cognitive Revolution.
- Humans lived as hunter-gatherers for centuries, gradually turning to farming starting about 12,000 years ago.
- It was not until about 6000 years ago that early civilizations began to appear, and villages, towns and cities slowly came into existence throughout the bronze and iron ages. From that time onward significant developments occurred in architecture, writing, and various forms of government, often kingships or monarchies or republics and in Greece, a democracy.
- It was only around 2500 years ago that the major world religions and Greek philosophical thought came into being.

- For over a thousand years, the Catholic Church ruled in Europe as a religious monopoly and suppressed science and democracy.
- Since the 1500s, and the start of the Scientific Revolution, the way humans live has radically changed due to scientific, and technological advances. Inventors played a major role in this advancement. Has this made people happier? For some yes, but for all, no.
- In the last half of the twentieth century, secular liberal humanism won out over religion in most democratic countries, as well as over social and evolutionary humanism.
- With increasing populism, economic instability, inequality and the ever-accelerating Digital Revolution, the way ahead is uncertain. Homo sapiens has not created a stable world. Wars continue, and the environment is threatened.
- Sapiens the wise human, has turned out to not be so wise and remains greedy at times.
- Will Sapiens become extinct like Neanderthals? Will a better Homo species be invented through artificial intelligence and genetic engineering? Dr. Harari suggests it could be a possibility.

Dr. Harari holds a Ph.D in history from Oxford and is now a professor at Hebrew University in Jerusalem.,

HOMO DEUS: A Brief History of Tomorrow - *By Yuval Noah Harari*

As Reviewed by Magrit Alm in The Australian Humanist

THIS book can be seen as a sequel to the author's best-selling book Sapiens: A Brief History of Humankind. Whereas Sapiens showed us where we came from, Homo Deus shows us where we are going.

In the pre-amble "The New Human Agenda" and Part I "Homo sapiens Conquers the World", Harari guides the reader through the history of humankind. He starts by pointing out how, over thousands of years, humans lived in an unchanging world, bowing to the dictates of nature and god's cosmic plan. Then at the dawn of the third millennium humanity wakes up astonished at how much they have achieved in recent decades, e.g. more people die from eating too much than from eating too little; more people die from old age than from infectious diseases; more people commit suicide than are killed by soldiers/terrorists/criminals.

Of interest is the author's definition of the Anthropocene. Whereas Clive Hamilton sets the starting point for the Anthropocene in 1945, i.e. roughly when humans began to interfere with the Earth systems in a significant way, Harari, although acknowledging that we live officially in the Holocene, dates the beginning of the Anthropocene to 70,000 years ago when H. sapiens started their journey across the globe. And in the course of this journey changed the ecosystems in radical and unprecedented ways at an accelerating pace, where we now find ourselves responsible for the sixth extinction of other life forms.

Man became the dominant force on Earth. In terms of biomass 100 million tons make up large wild animals, 300 million tons are attributed to humans, and 700 million tons to man's enslaved servants, namely domestic animals.

Organisms are algorithms. I never thought of algorithms along those lines. Harari explains in great detail not only what an algorithm is, but also how it relates to humans and other animals. (The author has no doubt a heart for animals and the suffering our fellow travellers on Earth undergo at the hand of humans.) Whilst algorithms controlling machines work through mechanical gears and electric circuits, those controlling humans work through sensations, emotions and thoughts.

Throughout the book Harari, who is a historian and works as a tenured professor at the University of Jerusalem, asks questions and then systematically and analytically sets out to answer them, relying heavily on scientific evidence.

One such question is what differentiates humans from animals? Is it the soul (His conclusion: humans have no soul). Is it consciousness? (His conclusion: animals have consciousness too). Eventually he draws the conclusion that *Homo sapiens* is the only species on Earth capable of cooperating flexibly in large numbers. That gives humans an edge over animals.

In addition, *H. sapiens* rules the world because only humans can weave an inter-subjective web of meaning: a web of laws, forces, entities and places, all based on imagination. Imagination is then another characteristic where humans outperform animals.

This aspect of "meaning" is further explored in Part II. A chapter entitled "Homo sapiens gives Meaning to the World" deals at length with what he calls the Humanist Revolution. It must be said here that Harari's definition of religion is not confined to the belief in supernatural forces. Religion is worship of an idea, an ideology. Thus, humanism is the worship of humanity, gaining faith in humanity and losing faith in a god.

Harari then turns his mind to the Humanist Schism, asserting that humanism split into three different branches: the orthodox version is liberal humanism, which centres around individualism and freedom. An offshoot of humanism is "social humanism", which Harari equates with socialist and communist movements. The third offshoot is "evolutionary humanism" where he includes fascism. Again, the author amply explains these concepts and reinforces them with examples.

Part III, "Homo sapiens Loses Control", is the most exciting and perhaps most frightening chapter of the book. It deals with the amazing scientific and technological advances humans have made over the last two centuries and especially during the 20th and 21st centuries, and how these advances may work against humans but also for humans.

It is of course by now common knowledge that digital/robot technology will displace labour at an increasing rate and may even reverse the current trend towards globalisation; but new technologies have traditionally led to new occupations hitherto not thought of.

Nevertheless, the author raises the question: what to do with all these now superfluous people? Although, unlike Clive Hamilton, Harari does not address global depopulation as a topic, this question appears to be on his mind.

The book closes with a chapter on “Data Religion Dataism”, in which he discusses the confluence of biochemical algorithms and electronic algorithms. This to some is perhaps the most-scary aspect. Homo sapiens, as we know it, has run its course; we should therefore use technology to create Homo Deus, which is a much superior human model. This “god” does not have its origin in the Middle East like the ancient gods, but in Silicon Valley.

At the very end of the book the author concedes that we cannot predict the future; thus, the scenarios outlined in the book should be-seen-as possibilities and not prophecies.

In the typical fashion of this author’s style of writing, he leaves the reader with three questions to ponder:

1. Are organisms really just algorithms, and is life really just data processing?
2. What’s more valuable: intelligence or consciousness?
3. What will happen to society, politics and daily life when non-conscious but highly intelligent algorithms know us better than we know ourselves?

Harari is an amazing storyteller. His book brims with tales from history, with anecdotes, examples and (wise) messages.

My favourite story is about the history of lawns: they are a status symbol identifying power, social status and wealth. In the words of Jared Diamond, he tackles the biggest questions of history and of the modern world. His book is easy to read, lively, refreshing and entertaining.

I found it hard to put the book down, not only for its contents of synthesising the past with the future, but also because of the style in which it was written. I can only recommend it as a good read.

What Lies Ahead?

In a recent interview, the Head of Daimler Benz (Mercedes Benz) said their competitors are no longer other car companies, but Tesla (obviously), and now, Google, Apple, Amazon etc. Additional forecasts that are mentioned are listed below.

Software will disrupt most traditional industries in the next 5-10 years. Uber is just a software tool, they don't own any cars, and are now the biggest taxi company in the world. AirBnB is now the biggest hotel company in the world, although they don't own any properties.

Artificial Intelligence: Computers become exponentially better in understanding the world. This year, a computer beat the best Go player in the world, 10 years earlier than expected.

In the U.S., young lawyers already can't get jobs. Because of IBM Watson, you can get legal advice (so far for more or less basic stuff) within seconds, with 90% accuracy compared with 70% accuracy when done by humans. So, if you study law, stop immediately. There will be 90% less lawyers in the future, only specialists will remain.

Watson already helps nurses diagnosing cancer, 4 times more accurate than human nurses. Facebook now has a pattern recognition software that can recognize faces better than humans. In 2030, computers will become more intelligent than humans.

Autonomous cars: In 2018 the first self-driving cars will appear for the public. Around 2020, the complete industry will start to be disrupted. You don't want to own a car anymore. You will call a car with your phone, it will show up at your location and drive you to your destination. You will not need to park it, you only pay for the driven distance and you can be productive while driving. Our kids will never get a driver's license and will never own a car. It will change the cities, because we will need 90-95% less cars for that. We can transform former parking spaces into parks. 1.2 million people die each year in car accidents worldwide. We now have one accident every 60,000 miles (100,000 km), with autonomous driving that will drop to one accident in 6 million miles (10 million km). That will save a million lives each year. Most car companies will probably go bankrupt. Traditional car companies will try the traditional approach and try to build a better car, while tech companies (Tesla, Apple, Google) will take the revolutionary approach and build a computer on wheels. Many engineers from Volkswagen and Audi are completely terrified of Tesla. Auto Insurance companies will have massive trouble because without accidents, car insurance will become much cheaper. Their car insurance business model will slowly disappear. Real estate will change. Because if you can work while you commute, people will move further away to live in a more beautiful neighborhood.

Agriculture: There will be a \$100 agricultural robot in the future. Farmers in 3rd world countries can then become managers of their field instead of working all day on their fields. Aeroponics will need much less water. The first Petri dish that produced veal is now available and will be cheaper than cow produced veal in 2018. Right now, 30% of all agricultural surfaces is used for cows. Imagine if we don't need that space anymore. There are several start-ups who will bring insect protein to the market shortly. It contains more protein than meat. It will be labeled as "alternative protein source" (because most people still reject the idea of eating insects).

There is an app called "moodies" which can already tell in which mood you're in. By 2020 there will be apps that can tell by your facial expressions, if you are lying. Imagine a political debate where it's being displayed when they're telling the truth and when they're not.

Bitcoin may even become the default reserve currency ... Of the world!

Longevity: Right now, the average life span increases by 3 months per year. Four years ago, the life span used to be 79 years, now it's 80 years. The increase itself is increasing and by 2036, there will be more than a one-year increase per year. So, we all might live for a long time, probably way more than 100.

Education: The cheapest smart phones are already at \$10 in Africa and Asia. By 2020, 70% of all humans will own a smart phone. That means, everyone has the same access to world class education. Every child can use Khan academy for everything a child needs to learn at school in First World countries. There have already been releases of software in Indonesia and soon there will be releases in Arabic, Swahili, and Chinese this summer. I can see enormous potential if we give the English app for free, so that children in Africa and everywhere else can become fluent in English. And that could happen within half a year. Are you ready for the future?

Editors Note. Forecasting the future is a tricky business. Unexpected events always seem to happen that change the way events unfold. Although many of the changes forecast above will certainly come to pass, others may not. But one thing is certain. Science and technology will advance much faster than the fading away of fundamentalist religions. A peaceful world will be more achievable when secular societies become predominant, and religions are in the background. But unfortunately, it will take time for a universal secular world free of theocracies to come into being.

Income – Expenses = ?

I don't think it is too much of a stretch to claim that the most important equation ever devised by humankind is Einstein's Energy = Mass X the Velocity of Light Squared, because this equation tells us that if humans are ever irrational enough to engage in massive nuclear warfare, humanity as we know it could become extinct. It can't get more serious than that.

Another important equation, however, is the one depicted in the title of this article. This uncomplicated, ubiquitous equation comes into the lives not only of individuals, but also must be taken-into-account by families, municipalities, provinces and countries. Simply put, if the answer is negative, the entity in question should be able to foresee and possess the means to eventually turn the answer into a positive number.

For example, in the case of an individual, careful budgeting and living within one's means is necessary in-order-to stay in the black. Remembering that a \$30 watch will tell the same time as a Rolex should be a useful guideline in deciding what to purchase. For families with a mortgage and or a car loan, a guaranteed future income stream is an essential for paying off the debt. For municipalities, provinces and countries, tax revenue over the long term must be sufficient to cover necessary expenses. And remember, paying interest on a loan is a costly expense and should be kept to a minimum. Banks get rich on interest.

The obvious conclusion to be derived from the above is that in-order-to keep the answer to this equation positive over time, there must be a continuing prosperous economy. Individuals must have adequate paying jobs in-order-to pay off debt and the overall economy must generate enough tax revenue to provide the infrastructure and social safety nets for all citizens to enjoy a comfortable life-style. This can only be achieved if competent elected political leaders are in place to enable a country to wisely use its natural resources and the talents of its citizens. Let's hope competent leaders will come forward. (DAH).

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