

Book Summary and Review I: Sapiens: A Brief History of Humankind - Yuval Noah Harari

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Introduction

In this paper, we will summarize and criticize Yuval Noah Harari's book, "*Sapiens: A Brief History of Humankind*."¹ This book has become a sensation in recent years; it occupied the best seller lists for long time, got praise from numerous "respected" people, and turned into a widely accepted long-term history of our species. Despite the fact that Harari wants to present his book as an impartial, objective and scientific account of the history of our species without the distortion of any value judgments, and the large part of the public seems to swallow this claim, *Sapiens* is no more than an updated version of the old idealist progressivist narrative of the technological development: *Homo sapiens*, with their unique cognitive abilities, are inventing ever more advanced technologies, and marching forward to transform themselves to gods: "*Homo deus*."

1. "The Cognitive Revolution"

Harari begins by reminding us that *Homo sapiens* were not alone in the world. There were other homo species on the planet as late as 10.000 years ago, and these were also human. About 2 million years ago, the archaic human species left Africa and began to spread to other continents. They developed into different human species in those places. There were at least six different human species.

One of the defining features of homo species was their big brains. Big brains bestow advantages to their owners, but they also bring disadvantages such as the large energy needed to fuel those big brains. Harari doesn't give any reasons why humans have developed big brains. There are some theories as to why (such as sexual selection, the stimulative effects of tool use, and hunting), but he is right in saying that we don't know the definitive answer. Another unique trait of humans is bipedalism: walking upwards on two legs. These two traits necessitate the premature birth of humans. Human babies are born vulnerable, and completely dependent on adults. This has had enormous consequences on the social and familial structure of human bands. Women, on their own, couldn't raise babies; they needed supplies and protection from other members of the tribe. This necessity increased the social abilities of humans.

Genus homo's position in the food chain, until recently, was in the middle. Humankind has ascended to the top level too quickly. Because of this, neither the ecosystems nor the humans themselves adopted a hundred percent to this reality. In contrast, lions or sharks evolved into top predator positions over millions of years. Domestication of fire and tool use were key events in the ascendance of humans into the top position of the food chain.

According to Harari, despite these characteristics (big brains, bipedalism, use of stone tools, and domestication of fire) humans were still marginal creatures up until about 70.000 years ago. In the sense that they didn't have a dominant place in the world's ecosystems. About 70.000 years ago, *Homo sapiens* began to spread out of Africa. This dispersal more or less coincided with the disappearance of other homo species all over the world. Two main theories try to explain why the disappearance of other homo species occurred. One is the inter-breeding theory, and the other is the replacement theory. According to the former theory, *Homo sapiens* interbred with other homo species which they encountered, and they merged into single populations. The other theory states that *Homo sapiens* replaced other human species by driving them into extinction

¹ Yuval Noah Harari, *Sapiens: A Brief History of Humankind*, Penguin Random House UK, 2015.

either by killing them directly or by driving them out from their habitats by using more effective hunting and gathering methods.

DNA mapping that was conducted on Neanderthal and Denisova genes showed that an unequal combination of the above-mentioned theories was in action in the history of the human species. “1-4 percent of the unique human DNA of modern populations in the Middle East and Europe is Neanderthal DNA,” and “up to 6 percent of the unique human DNA of modern Melane-sians and Aboriginal Australians is Denisovan DNA.”² Therefore, this DNA mapping indicates that other human species went extinct contributing only a tiny percentage of their DNA to the modern human genome. *Homo sapiens* replaced them with only a little interbreeding. Besides, the fact that native human species went extinct no sooner had Sapiens arrived at their location is another clue that *Homo sapiens* replaced these other human species either by killing them directly or driving them out with more effective hunting and gathering techniques.

According to Harari, *Homo sapiens* made a great leap forward about 70,000 years ago. He calls this “the Cognitive Revolution.” Harari claims that “the Cognitive Revolution” was the consequence of a genetic change in *Homo sapiens*. A genetic mutation that changed the wiring of the human brain. After this genetic shift, the cognitive abilities of *Homo sapiens* improved dramatically. Harari claims that we see the signs of this revolution in the artifacts and art objects created after the cognitive revolution: boats, oil lamps, bows, arrows, needles, symbolic artistic objects, cave paintings, etc. This story about the Cognitive Revolution has paramount importance for the narrative that Harari tries to create about the history of our species. From this point onward in the book, he explains every dramatic change in the history of our species as a consequence of the cognitive and imaginative abilities of our species. This one event, this chance mutation that rewired our brains, has paved the way for all the leaps and turns that have occurred in the history of our species. This simplistic and sensationalist way of explaining the big events of our history might be a good recipe for writing an international best-seller, but it doesn’t explain the real reasons behind the unrelenting trend in human history: ever more complexification³ of human societies. He doesn’t mention or barely mentions the material conditions that drive this inexorable social development.

It is not a proven fact that “a Cognitive Revolution” occurred 70,000 years ago. There is no evidence of a neural mutation that dramatically rewired the human brain, or *Homo sapiens* who lived 30,000 years ago was qualitatively different or more modern than the members of the same species who lived 200,000 years ago.⁴ Instead of indicating a biological change in the species, the artifacts Harari mentions as the evidence of a “Cognitive Revolution” might be the results of cultural adaptations of human societies to the changing conditions of their environment: the

² Ibid, page 17.

³ “Complexity is generally understood to refer to such things as the size of a society, the number and distinctiveness of its parts, the variety of specialized social roles that it incorporates, the number of distinct social personalities present, and the variety of mechanisms for organizing these into a coherent, functioning whole. Augmenting any of these dimensions increases the complexity of a society. Hunter-gatherer societies (by way of illustrating one contrast in complexity) contain no more than a few dozen distinct social personalities, while modern European censuses recognize 10,000 to 20,000 unique occupational roles, and industrial societies may contain overall more than 1,000,000 different kinds of social personalities.” Joseph A. Tainter, *The Collapse of Complex Societies*, Cambridge University Press, 1988.

⁴ For a more detailed discussion about this topic, see John J. Shea, *Homo sapiens Is as Homo Sapiens Was: Behavioral Variability versus “Behavioral Modernity” in Paleolithic Archeology*, *Current Anthropology*, Volume 52, Number 1, February 2011.

manifestations of complexification that was undertaken by humans to increase the carrying capacity of their ecosystems. But this line of reasoning is precisely the thing Harari omits in his sensationalist and simplistic explanations. He prefers to explain away the history by appealing to the imaginative abilities of the human species.

Harari sees language as the most defining and most consequential characteristic of our species. Because it makes us “talk about entire kinds of entities that [we] have never seen, touched or smelled.”⁵ In other words, it gives us the ability to invent legends, myths, narratives, ideologies, etc. These are the things Harari regards as the engines of human history. According to Harari, religions, laws (religious or secular), corporations (Apple, Mercedes, etc.), nations, states, etc. are all imagined realities. They don’t exist in the world as concrete things; they exist in our imagination and have effects on the real world only to the extent that we believe that they exist and act accordingly. And this ability to imagine the imagined realities was bestowed to us by the “Cognitive Revolution.” The ability to imagine “unreal” concepts enabled *Homo sapiens* to cooperate beyond its natural reference group which normally consists of at most 150 people. *Homo sapiens* can act collectively in big numbers (reaching up to millions) by imagining these imagined realities. The capacity of imagining concepts gives *Homo sapiens* the ability to revise its behavior and transform the structure of its societies according to changing conditions. The examples Harari gives to illustrate his points are the Peugeot company and the French Revolution.

Harari says that “Peugeot SA is a figment of our collective imagination.”⁶ Peugeot SA is a limited liability company; it is a legal fiction. These legal entities can borrow money; own land, machinery, and buildings; can be guilty of crimes; etc. However, they exist only in our imagination. But how can we say that Peugeot SA is *only* fiction or *just* an imagination? It seems that Harari is confusing the name, legal representation, or brand of an organization with its existence. Peugeot SA, as a corporation, is an organization consisting of machines, factories, buildings, workers, etc. It has to have these material components and organize them in a certain way to exist. Harari says that a disaster may kill all of Peugeot’s employees, and destroy all of its buildings and machines; but Peugeot would continue to exist even after this eventuality because it can borrow money and hire new employees, buy new machines, and build new factories. He says this to show that Peugeot SA is independent of its material aspects. But these are all rhetorical tricks employed to create surprise and sensation in readers, explaining nothing. Simply stating that corporations, nations, states, etc. are imagined realities created by the imaginative powers of *Homo sapiens* which were acquired after the so-called Cognitive Revolution says nothing about how these organizations have been constituted and what are the reasons that compel or direct a large number of human beings to organize themselves beyond their natural reference groups into those imagined realities. Of course, humans are capable of creating ideologies, narratives, and belief systems, and they use these abilities to create large organizations and motivate or coerce people to work inside these organizations. But the mere existence of this capability doesn’t explain how and why these organizations have been created. What are the underlying material conditions that still drive this ever more complexification?

Harari says that “since large-scale human cooperation is based on myths, the way people cooperate can be altered by changing the myths.”⁷ Thus the French population almost overnight

⁵ Harari, page 27.

⁶ Ibid, page 32.

⁷ Ibid, page 36.

changed its myth in 1789. But stating this as Harari does implies that *Homo sapiens* can change its myths, ideologies, values, etc. at will, in a voluntary fashion. But the changing of superstructural aspects (myths, belief systems, scientific theories, laws, etc.) of societies doesn't happen at will. It is conditioned by the changes in the infrastructural (technological tools, energy and material resources, the environmental conditions a society finds itself in) and structural (how a society organizes its hierarchies, its class structure, organizational framework of its institutions that mediate the relationships among its members) aspects of the society.⁸ This was what happened long before the French Revolution. The changing of the myth was an adaptation of the superstructure to the changes in the infrastructure and structure. Besides, the changing of the myth didn't happen overnight. There were philosophers long before the revolution who were advocating the new myth.

Harari says that to understand our nature and history, we should look into the lives of our hunter-gatherer ancestors. Evidence is scarce regarding the ancient hunter-gatherers who lived in the times when everyone was hunter-gatherers; one way to remedy this problem is to look into contemporary hunter-gatherers. However, we can't be sure how accurately they represent the original, ancient hunter-gatherers. Since their lifestyle might have been disturbed through contact with sedentary people. Nevertheless, we can decipher some main features of the hunter-gatherer lifestyle either from archaeological evidence left by the ancient hunter-gatherers or from anthropological evidence gathered from the contemporary hunting people. The evidence suggests that:

- Hunter-gatherers lived in small bands of up to 150 people. In their daily life, they encounter, interact and cooperate with a small number of people whom they know personally.
- They lived in nature, and they had extensive knowledge about the environment (its geographical features, fauna, flora, etc.) they live in. They had extensive abilities and knowledge in making stone tools, moving in the wilderness and finding their way, hunting, and protecting themselves from wild animals to survive in the locality they live in.
- Individually, they were much more capable and knowledgeable than a modern man is with regards to survival skills and the knowledge of their environment. They know all the animals, plants, and landscape features of their environment. They know how to move efficiently in the wilderness. In short, they were much more autonomous compared to a member of a civilized society. The collective knowledge of human societies has increased, but an average member of a civilized society is an ignoramus compared to the survival, life-and-death skills, and knowledge of an average hunter-gatherer. Harari mentions that "the size of the average Sapiens brain has *decreased* since the age of foraging."⁹
- Nomadic hunter-gatherers were on the move influenced by the changing of the seasons, the annual migration of animals, and the growth cycles of plants. They usually traveled back and forth in the same home territory. In some exceptionally rich environments, there were also sedentary hunter-gatherer societies.

⁸ Infrastructure, in the long-term, has deterministic priority over structure and superstructure. What determines and shapes ultimately structural and superstructural aspects of a society are its infrastructural features.

⁹ Ibid, page 55. See page 468, footnote 5 for the sources of this claim.

- Their diet was varied, consisting of lots of options depending on the locality they lived in. “They scoured for termites, picked berries, dug for roots, stalked rabbits, and hunted bison and mammoth.”
- Harari says that “on the whole foragers seem to have enjoyed a more comfortable and rewarding lifestyle than most of the peasants, shepherds, laborers and office clerks” of the subsequent sedentary human societies. Harari is right that the foraging lifestyle was more rewarding and interesting than the lifestyles of sedentary people. Because they were living autonomously relying on their own skills and capacities. They were the organizers of their own lives. Precisely these facts made the foraging lifestyle more interesting, rewarding, meaningful, etc. But we should be extremely cautious about using “comfortable” to define the foraging lifestyle. There lies the danger of falling into the trap of romanticizing the hunter-gatherer lifestyle. Comfort is generally understood as the absence of physical exertion and living in artificially controlled and stuffed places. The hunter-gatherer lifestyle requires extensive physical exertion in natural habitats.
- Harari compares the working hours of sedentary societies (agricultural and industrial) with the “working hours” of hunter-gatherer societies and claims that the working hours of the latter were shorter than the former.¹⁰ This comparison, if it is strictly a quantitative comparison, depends on how one defines the “working hours” of sedentary and hunter-gatherer societies. However, this comparison is inadequate in a more fundamental way. The distinction between working hours and leisure hours is a modern concept, and we can’t apply this modern concept as a criterion to hunter-gatherer societies. The activities in hunter-gatherer societies that people engage in are about their immediate physical existence; they are directly connected to the most important things for an individual. Besides, these activities are conducted autonomously either individually or as a member of a small group. People need to use their intellectual and physical abilities in a varied and challenging way in order to accomplish them. That is why these activities are much more rewarding, satisfactory, and interesting than sitting in a cubicle all day while looking at pixels. These activities may take long hours to complete, but people who undertake them successfully would feel satisfied after doing them, and wouldn’t need the “leisure” to fill the emptiness modern work leaves behind. Of course, it is important how many hours of a day one spends confined in a cubicle or confined to a spot in an assembly line, but what is wrong with modern jobs isn’t their duration itself, but it is the way they are organized and the way they are performed. People work in those jobs without any autonomy and initiative, performing the minuscule part of a whole job which itself is generally absurd and has no relation at all with the fundamental needs of the worker. Spending a considerable part of one’s life in this manner leaves behind feelings of emptiness, meaninglessness, inadequacy, powerlessness, isolation, unsatisfaction, etc. And leisure is the time slot in which all these feelings are tried to be suppressed by entertainment and consumption. Leisure and working hours are the two sides of the same coin, complementing each other.
- Hunter-gatherers had fewer infectious diseases because they didn’t live in crowded communities close to domesticated animals.

¹⁰ Ibid, page 56.

- Harari claims that we can't decide whether hunter-gatherer societies were warlike or peaceful. But there is enough evidence to show that violence (both to animals and other people, especially to strangers) was an integral part of the hunter-gatherer existence.¹¹

Harari makes this general summary of the hunter-gatherer lifestyle to understand our nature. But, strangely, he doesn't use the findings of this summary in the chapter (see below), where he investigates the happiness and the purpose of life.

45,000 years ago, *Sapiens* began to colonize the lands separated from the Eurasian-African land mass. They reached Australia at about that time. After the arrival of *Sapiens* to Australia, more than 90 percent of Australia's megafauna went extinct within a few thousand years. According to Harari, our ancestors were responsible for these extinction events. Evidence indicating *Sapiens*' responsibility are:

1. Some scholars blamed climate change, but the species that went extinct after the *Sapiens*' arrival had survived through numerous climate change events in the past.
2. Climate change affects sea creatures and terrestrial animals equally. Oceanic fauna didn't experience extinction at the scale of the terrestrial fauna.
3. In other locations (New Zealand, Wrangel Island, South, and North America) where *Homo sapiens* arrived in evolutionary recent times, similar mass extinction events occurred. All these extinction events indicate a pattern. It is not probable that all of them coincided with the arrival of humans without their contribution to these extinction events.

Harari classifies the extinction events humans have caused in three waves. This is an interesting perspective that highlights what humans have done and are still doing to wild Nature. First wave extinction was caused by the spread of the foragers. The second wave was caused by the spread of the sedentary agricultural societies. We are now in the third wave of extinction events that have been caused by humans and this one is due to industrial activity. Each wave goes deeper and wider in its effects than the previous one. The third wave extinction caused by industrial activity has reached the oceans and is now decimating the mega-fauna of the oceans.

2. The Agricultural Revolution

According to Harari, the Agricultural Revolution has been a disaster for the human race. It increased the total food available to humanity but led to an explosion in population, a poorer diet, strict hierarchies in the structure of the society, and a dull and unstimulating lifestyle. Harari's observations are right in assessing the consequences of the Agricultural Revolution.

Harari depicts the Agricultural Revolution as a miscalculation and as a trap that humanity was caught, unaware of the long-term consequences. Humans were caught in the trap of eating more and more wheat. As the last ice age gave way to a period of global warming, this created a climate more favorable to wheat. Humans started to eat more wheat. They needed to process wild

¹¹ For the evidence of war and violence in hunter-gatherer societies see, Lawrence H. Keeley, *War Before Civilization: The Myth of the Peaceful Savage*, Oxford University Press, 1996; Azar Gat, *War in Human Civilization*, Oxford University Press, 2008. [12] There were literal human calculators up until the 60s who were responsible for making arithmetic calculations.

wheat to eat it, so they carried it to their campsites. As a result, more and more wheat started to grow on the campsites and near the trails of the humans. Harari says that since wheat became more abundant in campsites where other food sources such as game were also abundant, people started to abandon their nomadic lifestyle and settle down. They discovered that they could achieve better harvests by sowing the grains deep in the ground, weeding the fields, guarding them against parasites, watering, and fertilizing them. Gradually, with each intervention on behalf of wheat, they approached full agriculture and a settled lifestyle. During this process, they increased the total amount of food they produced, but their population increased even more in proportion. At each step carrying them closer to full agriculture, they thought they were increasing the food available per person. But the increased production of food resulted in an increased population; as a result, available food per capita didn't increase, on the contrary, it decreased. Besides, the agricultural diet was worse in nutritional quality compared to the hunter-gatherer diet. At each improvement, they needed to increase the effort they put into food production. As they abandoned their nomadic lifestyle, they began to live in disease-ridden crowded settlements. In the end, their conditions became worse even though they were expending more and more effort on food production.

This trap of agriculture as Harari calls it is, in fact, characteristic of every technological development. It is the intensification process that characterizes the ever more complexification of human societies. Each improvement in a production process necessitates the investment of more effort, energy, and material in that process. Intensification in agricultural processes has continued until today. We are producing today more agricultural products in a given area compared to what was achieved with older agricultural methods. But we are doing this only with the consumption of huge energies obtained from fossil fuels that we use to power the big agricultural machines or to produce artificial fertilizers, pesticides, etc. The expenditure of energy per yield has enormously increased. And increased levels of agricultural yield allow us to feed ever-bigger populations, necessitating further intensification. This process of intensification (Harari's trap) isn't unique to agriculture and food production. We can see it in other domains also such as minerals and energy production, information processing, education, etc. In all those domains, the law of declining marginal returns applies. In each of these domains, as the low-hanging fruits are exhausted the returns one gets begin to decrease despite the increased effort. We need to exploit ever more difficult-to-reach and low-quality mineral and energy reserves, the data that we need to process and evaluate to maintain our ever more complex societies are in exponential growth but the returns we get from this data processing aren't increasing at the same rate, we need to train ever more specialized people for the jobs that are necessary for our highly developed societies and this means ever longer training years and allocation of bigger resources to education.

Harari omits to mention the previous intensification process that led to the Agricultural Revolution. He presents the Agricultural Revolution as a trick performed by the wheat to trap humanity in a vicious process of cultivating it more and more to spread itself all over the world. Harari himself is playing a cheap rhetorical trick here to create a sensation in readers by employing a narrative style with two protagonists (Sapiens and wheat). But it doesn't help much in explaining why humanity resorted to agriculture in different places independently from each other more or less at the same time in the context of the evolutionary time frame. The hunter-gatherer economies reached their carrying capacities by a similar intensification process that has pushed later agricultural societies to more sophisticated agricultural techniques. As Harari

also mentions, humans spread to all of the continents of the world except for Antarctica, and the mega-fauna of these continents were decimated after the arrival of humans. The agricultural revolutions occurred in each suitable location independently from each other when the abundant herds of big herbivores were exhausted. As a result, humans were forced to intensify their methods of food procurement by switching to agriculture.

When he discusses animal domestication, Harari contrasts the evolutionary success of a species with the individual contentment of its members. In terms of evolutionary success, which looks at only how widespread and numerous a species is, domesticated chickens, cows, and sheep are quite successful. They have spread to every part of the world, and their populations are much higher compared to wild animals. But they are paying a huge price for this since they are living miserable, horrendous lives. Moreover, their wild genetic heritage has been changed. They have become more docile, uninquisitive, meek, infantilized, and fat compared to their wild ancestors. Compared to their wild cousins who roam freely in the wilderness, their lives consist of pulling or carrying weight under the lash or standing in a confined area waiting to be slaughtered. There is an uncomfortable similarity in all this with the fate of *Homo sapiens* as he lives in more and more artificial environments. The population of the *Sapiens* and the collective power of its societies have increased, but on the individual level, he is living a life confined to cubicles and apartment flats chasing electronic stimuli. To his credit, Harari also notes this similarity.

As agriculturalists began to produce and stock more food, their population increased and their settlements became more crowded. The growth of the population brought the stratification of society. Hierarchies (soldiers, priests, kings, bureaucrats, peasants, etc.) based on different functions appeared in societies. As the population got bigger, the imagined realities became necessary to ensure the cooperation of a large number of people.

Homo sapiens aren't adapted evolutionarily to cooperate in large numbers. In our evolutionary history, we adapted to cooperate with a small number of people that we directly and personally know. We were programmed via kin selection and reciprocal altruism to cooperate with this small number of people. But social organizations of sedentary societies go much beyond and require thousands and even hundreds of millions of people to cooperate. The stability and functioning of the society depend on the success of this cooperation.

According to Harari, religions, big gods, laws, states, etc. are all imagined realities or myths that are concocted to ensure that cooperation. They are imaginary in the sense that they are concepts lodged in the neural circuitry of people without outside existence. Harari discusses two instances of these myths: the Hammurabi Laws and the American Declaration of Independence. These two texts are cooperation manuals. They establish sacred values that guide the interactions among people. For example, the American Declaration of Independence claims that people are created equal with inalienable rights such as life, liberty, and the pursuit of happiness. This sentence is full of imagined realities that don't correspond with the objective reality: People are not created, but evolved; they are not equal but are bestowed with different characteristics during this evolutionary process and are subjected to different environmental conditions. But imagining and treating them as equals are more conducive to the smooth functioning of the social machine in modern conditions. Albeit a different one, the Hammurabi Laws were also constituted on a myth. A myth which was purporting the existence of universal and eternal principles of justice (the paramount importance of hierarchy), dictated by gods. According to this, people were divided into two genders and three classes: superior peoples, commoners, and slaves. The laws

were based on the premise that if the king's subjects all accepted their positions in the hierarchy and acted accordingly, the empire's millions of inhabitants would be able to cooperate effectively.

The orderly functioning of human societies doesn't depend solely on the myths of these societies. It also depends on the coercive capabilities (violence, physical coercion) of those societies. People follow the norms and laws *en masse* not only because they believe in the myths of their societies, but also because they fear that they will be punished physically if they don't do so. Harari doesn't emphasize this point enough.

It seems like Harari imagines the myths (imagined realities) as some kind of a Matroska doll hanging in the air without any support. The myth of Peugeot SA resides in the myth of the French legal system, the French legal system resides in the myth of the French state, and in the last instance, all these myths come forth from the neural capacities of *Homo sapiens* that were transformed dramatically with the so-called Cognitive Revolution. All human history is the succession of myths that create, transform, and shape human societies. They come forth from the imaginative powers of *Homo sapiens*, clash with each other, transform each other, and constitute the history of our species. Harari doesn't mention at all the material infrastructure (energy and material resources, demography, technological tools, etc.) of the human societies that shape these imagined realities in the long run. Myths, as the superstructural components of human societies, are created according to the developmental level (the level of complexity) of the societies. The myths (imagined realities) are not independent of the material part (its technology, its energy resources, its demography, etc.) of the society. With the advancement of technology, human societies acquire and consume more energy, they develop ever more rapid communication and transportation technologies, their demography increase and they develop more intense relationships among their own components and with the other societies (communication, trade, migration, etc.) All these developments increase the collective nature of human societies, and the myths which accompany these societies become more collective as well. We see this phenomenon in action in the myths of the Hammurabi Laws and the American Declaration of Independence. The first one envisioned a hierarchical society that classified humans into three different classes: superiors, commoners, and slaves. Nevertheless, it tried to integrate all these people into a whole, under the guidance and protection of the divine-king Hammurabi. In the American Declaration of Independence, this collective character was further developed. In modern American society, all individuals are deemed equal and bestowed with the same rights. They are individual and equal parts of a big whole, participating in it according to their capabilities.

As human societies got ever more complex, ever more data needed to be collected, archived, retrieved, and manipulated. Statistics on production, consumption, taxes; archives on ownership statutes, contracts; laws organizing the relationships among people. This vast data was necessary for the functioning of the new sedentary, complex societies. After a certain threshold, this information overload became too much to be handled with mere human brain power. The writing was invented to keep records on production, taxes, ownership statuses, laws, etc. As societies have got more complex, the writing systems and data collecting, recording, and manipulating technologies also have developed further: from simpler number systems to Arabic numerals that use value systems on positions and the number zero. We can extend these observations of Harari to computer technology. Computer technology is a direct consequence of this process of information inflation. Data storage and processing technologies have evolved from manual human brain power calculation to mechanic calculators of the 16th century to the big frame computers

of the early 20th century to the supercomputers of the 21st century. Data collection technologies have evolved from manual data collection to face-recognition algorithms.

Computer technology has become a necessity just as writing has become a necessity when human societies reached a certain level of complexity. Each step further in the development of data storage and processing technologies has rendered human capabilities (mere brain power in calculating or memorization) in these areas more obsolete. Sometime during the middle of the 20th century, the information load has become so huge that it became impossible for humans to manipulate this vast data. Humans continued to program the computers that carry out data storage and manipulation as computers began to replace human calculators.[12] Nowadays, algorithms that processors use to manipulate data have become so complex that the capabilities of human programmers are now becoming inadequate to program computers. With the accumulation of vast digital data and developments in processor technology, we now witness machines that program themselves (this is called machine learning or artificial intelligence).

In the section called “There is no justice in history,” Harari discusses inequalities in sedentary human societies. He says that there hasn’t been one completely egalitarian society in history. He remarks that since all complex societies have had this hierarchical structure, it seems that complex human societies require imagined hierarchies and unjust discrimination. According to Harari, these hierarchies are the products of human imagination. It seems Harari confuses the ideological legitimization of these hierarchies with the reasons for their actual occurrence and their continuation. He thinks that the reason these hierarchies have appeared is that *Homo sapiens* have acquired the ability to imagine those hierarchies during the so-called Cognitive Revolution. With a little bit of effort, he could even attribute these hierarchies to the Big Bang.

Harari discusses the hierarchies in American society such as the distinction between rich and poor, between men and women, whites and blacks, etc. and he claims that these distinctions are rooted in fictions.¹² He then talks about the ideologies that legitimize these distinctions: white supremacist ideology that claims the biological superiority of white race or some religious justifications which claim that God created people unequally, etc. But these ideological systems are legitimizations and they, at most, help to perpetuate the existing hierarchies. They don’t themselves create the hierarchies. Moreover, they are not powerful enough to preserve those hierarchies despite the changing material conditions that made these hierarchies possible and convenient. Harari says that “European conquerors chose to import slaves from Africa rather than Europe or East Asia due to three circumstantial factors.”¹³ First factor was that Africa was closer to America than other possible locations such as Southeast Asia. Second, in Africa, there already existed a well-developed slave trade. Third, American plantations in the south were plagued by malaria and yellow fever that Africans had partial genetic immunity. These are all possible reasons why Europeans chose to import slaves from Africa to their plantations in America, but they don’t explain why it was Europeans instead of Africans who discovered America, colonized that continent successfully and started the Atlantic triangular trade. We need to look at some deeper material conditions such as the fact that western Europe was part of the Eurasian landmass that connected civilizations from China to Western Europe. This land connection facilitated the spread of new technologies, techniques, and ideas. The Eurasian landmass was home to the animal and plant species that were most suitable for domestication. That is why civilization started there ear-

¹² Harari, page 150.

¹³ Ibid, page 157.

lier than on other continents. These and some other material conditions facilitated the more rapid complexification of the human societies which were located in the Eurasian landmass, and they acquired more material power (energy, demography, technological means) compared to the human societies of the Americas and sub-Saharan Africa. But Harari doesn't mention any of these; he prefers to make the sensationalist claim (which soothes the inferiority feelings so widespread in the techno-industrial society) that all hierarchies are rooted in fiction.

In the parts he discusses the different social roles of the sexes, he says that "patriarchy is so universal. [...] Even before 1492, most societies in both America and Afro-Asia were patriarchal, even though they had been out of contact for thousands of years. [...] It is far more likely that even though the precise definition of 'man' and 'woman' varies between cultures, there is some universal biological reason why almost all cultures valued manhood over womanhood. We do not know what this reason is."¹⁴

Harari repeats here the leftist dogma of "patriarchy." The claim that human societies are constructed by males to oppress and exploit females; the claim that there are two distinct classes in human societies, the oppressors (males) and the oppressed (females). Harari doesn't give a clear definition of "patriarchy." But what he means by it can be gleaned from what he says on page 171. According to this, men (he should say some men) have been in positions of political, religious, and military power. "Fewer resources are invested in the health and education of women; they have fewer economic opportunities, less political power, and less freedom of movement." These claims divide society into two distinct classes: males and females. As if *all the males*, monopolizing the highest economic, religious, and military positions of the society, oppress and exploit *all the females*. This is not the case. Throughout history, a great part of the population has been excluded from the high-status positions of society. Not only females but also most males. Moreover, it has been men who have undertaken the most dangerous and physically demanding tasks such as construction works, mining operations, wars, etc. Harari's citation from the Duke of Wellington is illuminating in that regard. The Duke talks of his soldiers as "the scum of the earth."¹⁵ Since these "scum of the earth" were all males, it doesn't seem that they were the oppressors of a "patriarchal" society.

Harari says that we don't know the reasons why some males have monopolized the high-status positions of society. He investigates three possible reasons and finds that all of them lack adequate explanations for this phenomenon. According to Harari, the fact that males have more muscle power than females can't explain this phenomenon. Because "there is often an inverse relation between physical prowess and social power. *Sapiens'* mental and social skills placed them at the top. Consequently, it sounds improbable that the most influential and most stable social hierarchy in history is founded on men's ability physically to coerce women."¹⁶ Males are, on average, more aggressive than females, but this also can't be an explanation, claims Harari. Because "an aggressive brute is often the worst choice to run a war. Much better is a cooperative person who knows how to appease, how to manipulate and how to see things from different perspectives."¹⁷ The third possible reason that attempts to explain male supremacy is:

...through millions of years of evolution, men and women evolved different survival and reproduction strategies. As men competed against each other for the opportunity to impregnate

¹⁴ Ibid, page 172.

¹⁵ Ibid, page 174.

¹⁶ Ibid, page 173.

¹⁷ Ibid, page 175.

fertile women, an individual's chances of reproduction are dependent above all on his ability to outperform and defeat other men. As time went by, the masculine genes that made it to the next generation were those belonging to the most ambitious, aggressive, and competitive men.

A woman, on the other hand, had no problem finding a man willing to impregnate her. However, if she wanted her children to provide her with grandchildren, she needed to carry them in her womb for nine arduous months, and then nurture them for years. During that time she had fewer opportunities to obtain food and required a lot of help. She needed a man. In order to ensure her own survival and the survival of her children, the woman had little choice but to agree to whatever conditions the man stipulated so that he would stick around and share some of the burdens. As time went by, the feminine genes that made it to the next generation belonged to women who were submissive caretakers. Women who spent too much time fighting for power did not leave any of those powerful genes for future generations.

The result of these different survival strategies –so the theory goes– is that men have been programmed to be ambitious and competitive, and to excel in politics and business, whereas women have tended to move out of the way and dedicate their lives to raising children.¹⁸

According to Harari, this approach seems to be belied by the empirical evidence. Because the assumption that women's dependence on external help made them dependent on men, rather than on other women, and that male competitiveness made men socially dominant is particularly problematic. He says that in "bonobo and elephants, the dynamics between dependent females and competitive males result in matriarchal society. Since *Sapiens* are relatively weak animals, whose advantage rests in their ability to cooperate in large numbers, we should expect that dependent women, even if they are dependent on men, would use their superior social skills to cooperate among themselves, while outmaneuvering and manipulating the aggressive, autonomous and self-centered men."¹⁹

What led astray Harari in finding an explanation for the fact that throughout history some men have occupied the highest social positions is that he seems to internalize thoroughly the prevailing male bashing leftist dogma. He enumerates three stereotypical male characteristics and tries to show why these can't explain male "dominance." But he pairs these three characteristics with their corresponding "bad" side effects. Males have more muscle power, but this makes them strong brutes who don't have social and organizational skills. Males are more aggressive, but this makes them simple-minded beings who can't cooperate and see things from different perspectives. Males are competitive, but this makes them self-centered and uncooperative. But this is not the case in reality; these characteristics are not always paired with their "bad" side effects.

Because men and women have been subjected to different evolutionary pressures, they have, on average, different characteristics. This fact demonstrates itself in behavioral/psychological characteristics, as well as in physical characteristics. Men are, on average, more aggressive, more competitive, more open to taking risks, and more powerful physically. But these don't mean that males can't cooperate, see things from different perspectives, act with tact, etc. *Homo sapiens* aren't bonobos or elephants. In *Sapiens* communities, it has been predominantly males who have cooperated to protect the band, hunt, attack other bands, etc. They have been the organizers. They are the ones who have formed coalitionary groups. As Harari also seems to suspect on page 178,

¹⁸ Ibid, pages 176-177.

¹⁹ Ibid.

males of the species *Homo sapiens* are not only characterized by physical strength, aggressiveness, and competitiveness, but they (on average) also have superior organizational skills and a greater tendency to cooperate than average women. But acknowledging this fact would be a great heresy in today's world.

3. Unification of Mankind

Harari says that simpler and smaller cultures are gradually coalescing into big civilizations. This is the general tendency in human history. According to him, the engine that moves history is the clash of ideas. Because every culture harbors contradictory ideas; it is this contradiction that makes them dynamic. He doesn't explain how, but this dynamism somehow compels the separate civilizations to coalesce with each other.

From 10,000 BC to the present day, separate human worlds have amalgamated; we are now living in a global human civilization that encompasses the whole world. Harari claims that this has been achieved mainly thanks to an idea, the idea of universal order. *Homo sapiens* evolved to think people grouped into "us" and "them." "Us" was the group to that we belong, the people immediately around us. "Them" was everyone else. At first, humans didn't want to do anything with "them." They feared "them," and saw them as potential enemies. According to Harari, humans acquired the ability to supersede this mentality thanks to "the Cognitive Revolution." People have acquired the ability to imagine unreal "brotherhoods" and "sisterhoods." According to Harari, three factors have played leading roles in creating the idea of universal order. They helped *Homo sapiens* to overcome their default "us" vs. "them" mentality. These three factors were money, empire, and religion. But focusing on these three factors, Harari confuses again the real reasons for this unification, this amalgamation of the cultures, with the means employed to achieve it. Or at best, he emphasizes the secondary reasons without even mentioning the primary ones.

As societies became more complex, specialization (people who specialize in different jobs, or locations focusing on different products) increased. Barter was sufficient for conducting exchanges only up to a certain degree; after a certain threshold, it became ineffective in sustaining the exchange networks. Money, as the universal means of exchange, facilitated trade and made possible complex exchange networks. Money is the universal intermediary; every commodity became exchangeable with each other via money. These complex trade networks encompassing great areas created a universal trade order amalgamating different cultures. The unification of Afro-Asia was achieved by the appearance of a single transnational and transcultural monetary zone encompassing this area, and eventually, the entire globe has been united into a single economic and political sphere. Harari portrays money as the driver of the physical integration of human societies. But the appearance of a transcultural monetary zone was only the outward manifestation of physical integration. Afro-Asia wasn't connected to a single trade network by the idea of money, but it was connected by technological development. With technological development, human societies began to process more energy and material in their metabolisms. They began to produce surplus commodities. Technological development increased the specializations in a given society and also among different societies. Specialized surplus products were exchanged among societies with ever more advanced transportation technologies. The appearance of money as a universal exchange mechanism accompanied this physical integration. It facilitated this integration but didn't create it. Money was a tool people used to follow and record the transactions that were occurring in this physically integrated trade network.

Harari's other agent that pushed *Homo sapiens* out of his default mentality of "us" vs. "them" is empires. Empires are political organizations that rule more than one nation. They have an aspiration to rule all of humanity. They see their culture, language, manners, laws, etc. as universally superior, and they try to assimilate other people into their culture. They conquer and rule other people using violence, genocide, and deportation. Since they englobe different people with different cultures in one political organization without borders, they amalgamate these different people and cultures into a whole. Even after the demise of an empire, its common culture persists, and empires leave behind one people that consisted of different peoples before their conquests.

Harari doesn't investigate the reasons why people organize themselves in empires or why empires have the inclination to conquer adjacent people and try to amalgamate them into a coherent whole. If he investigated these questions, the reason he would find no doubt would be *Homo sapiens*' ability to imagine empires: That engine of history which has been with *Homo sapiens* since the so-called Cognitive Revolution.

Empires are geographically more extensive versions of states. States also unify different cultures, kinship groups, ethnicities, etc. into bigger amalgamations. They are not qualitatively different in that regard from empires. States are formed due to different factors that push human groups to greater complexity. Increased population and demographic intensity, a consequence of food production (agriculture and animal husbandry), make managerial hierarchies a necessity to organize the labor force for more complex food production activities such as irrigation works. Increased economic differentiation within a society requires centralized and hierarchically managed storage/redistribution of goods and products. States have a competitive advantage over less complex social forms; they dominate or absorb less complex social organizations. Social organizations, as self-propagating systems, are in a Darwinian competition with each other. Those social organizations that are more successful in absorbing and efficiently processing the energy and material resources of their environment gain an advantage over those which are less successful in that regard. This involuntary and inevitable Darwinian competition is what drives social organizations (chiefdoms, states, or empires) to expand their activities and absorb different cultures into bigger wholes. Empires don't have any unique quality in that regard; they represent a phase in the process of further amalgamation.

Harari's third great unifier is religion. Religion's key role in unifying humankind is that it bestows laws a divine legitimacy. Laws are the rules that organize relations among a large number of people. Harari defines religions as entire systems of laws that claim that laws they purport aren't made by humans, but are divine in origin. Religions claim to represent a superhuman order that is always true and valid everywhere. And they are missionaries in the sense that they try to spread this order to the whole world. These characteristics make religions a unifying power amalgamating different cultures together. It is true that religions legitimize laws and the management center of complex human societies. They are used to ideologically condition people to the behavior patterns that are needed in complex human societies. With their insistence on the brotherhood and sisterhood of coreligionists, they create a feeling of togetherness among a large number of people who don't know each other. The belief in big gods who watch people in every moment of their lives helps to mold people's behavior to more socialized patterns. In sum, religions are means that are used by complex human societies to condition the behaviors of their members to an unnatural degree of cooperation. Unnatural in the sense that humans haven't evolved to cooperate with large numbers of people whom they don't know personally. As Harari also mentions, we tend to group people into "us" and "them" categories. And "us" is the limited

circle of people whom we know personally via daily direct contact. Therefore, it is unnatural for us to live surrounded by thousands of strangers.

Harari omits to mention the transformations today's globalized technological society is causing in traditional religions. In today's highly globalized hi-tech world, classic axial religions (Christianity, Islam, Buddhism, etc.) tend to become more divisive and create religious tensions instead of fostering greater unity among people. This is because modern communication and transportation technologies create a globalized society in which people from different religions come in regular contact with each other. For this reason, classic religions are retreating into the individual belief worlds of their members instead of organizing the communal life of the society. They are more and more emphasizing tolerance among different religions. They are softening their harsh attitudes towards different social groups (such as homosexuals, non-believers, or the believers of different religions, etc.) The worldview, attitudes, beliefs, and values of the general population worldwide are being determined more and more by modern humanistic ideologies (especially by various forms of leftism). These humanistic ideologies, which have their roots in classical axial religions, are now hovering over these religions as arbiters modifying their more archaic notions according to the needs of the globalized techno-industrial system.

Harari says that humanistic ideologies are three in total: liberal humanism, socialist humanism, and evolutionary humanism. All of these regard humans as distinct from other species, and they consider humans as the most important of beings. Therefore, they define "good" as something that is good for humans, and that benefits humans. Liberal and socialist humanism (in fact, they are various forms of leftism that have evolved since the Industrial Revolution according to the needs of the techno-industrial system) inherit their core tenets from the Christian religion. According to Harari, Liberal humanism believes that each human individual has a unique core where resides his humanity. To protect and develop this inner core and its freedom are the supreme commandments of this ideology. Socialist humanism emphasizes the equality of humans. Humanity is collective and resides within the species *Homo sapiens* as a whole. Protecting equality within the species *Homo sapiens* is the supreme commandment of socialist humanism. Evolutionary humanism (these are Fascism and Nazism according to Harari) also considers humanity as the most valuable being but regards it as changeable as subject to the Darwinian evolutionary process. (Evolutionary humanism believes in a distorted version of the Darwinian evolutionary process, and it attributes value judgments to this process). It bestows itself the mission of protecting this humanity and advancing it by protecting it against the dangers of degeneracy, decay, etc.

What we need to emphasize here is that all of these humanistic modern ideologies have values that are incompatible with wild Nature. Because they regard the human species as sacred beings above and distinct from wild Nature. All of them, one way or another, accept the notion of "progress;" they regard the ever more complexification of human societies as "progress." But this "progress" is only possible with the subjugation and continuous replacement of wild Nature by complex human societies. Another consequence of this "progress" (ever more complexification of human societies) is that humans are forced to live in highly organized collective societies which are getting more and more different from the simpler small-scale communities they evolved in. They are living in artificial environments isolated from natural ecosystems. Overly-socialized behavior patterns that are necessary for this collective society and artificial conditions that are prevalent in this synthetic environment are defined as "progress" by humanist ideologies. The continuation of this "progress" results in the further suffocation of humans' wild nature

and the suppression of their psychological and physical needs. Humanist ideologies regard this suffocation as the “elevation” of humankind.

The dominant humanistic ideology in today’s modern world is leftism with its variants (Harari’s liberal and socialist humanism). Extreme right-wing ideologies, which sometimes represent a shallow reaction to the most extreme points of the leftist ideology, also harbor values that are against the autonomy of wild Nature. They regard humans (at least some of the humans) as sacred beings distinct from Nature. They base their values on a distorted version of the evolutionary theory, and falsely claim that it is possible to interfere artificially with the evolutionary process in order to speed up the “progress” with the aim of quickly “elevating” the human species. This claim basically amounts to saying that it is possible and strongly desirable to interfere with wild evolutionary processes –which are what create wild ecosystems– in order to exalt the human species. Needless to say, this claim contains serious threats to the autonomy of wild Nature. Extreme right-wing ideologies (Harari’s evolutionary humanisms) are, at their core, collectivist ideologies despite their insistence on the continual struggle among human groups. They attribute progressive values to this struggle and regard the winners as more valuable, sacred, elevated, etc. They insist that an individual should subjugate himself completely to the benefit of his group: an artificially extended community way beyond his natural reference group. They regard technology as the most potent weapon in the competition among rival human groups. They see cultural development (i.e. ever more complexification of human societies) as “progress,” a sublime value worth pursuing. Nazis, for example, claimed that they were protecting European civilization against the imminent danger of degeneration.

Harari says that the gradual unification of human communities is an inevitable result of the dynamics of history. This is a fair judgment considering the fact that human organizations have a tendency to enlarge themselves by absorbing more energy and material from their environment.

He then says that, apart from this general tendency of unification, the way history evolves is not deterministic; the historical development could have happened differently, and we could be living in a different world now. The examples he gives to illustrate his point are the historical developments of Christianity and Islam. He claims that it wasn’t determined from the start that these two religions would become two globally dominant monotheistic religions in the world. Nobody could have guessed and predicted in their beginnings that these two religions would become what they are today. Some other religions (such as Zoroastrianism, or Manichaeism) could be in the place of today’s Christianity or Islam. It is only pure chance that Christianity and Islam have become dominant monotheistic religions of the world. Harari claims the same thing for capitalism, national states, and human rights. These phenomena have become dominant thanks to pure chance.²⁰ According to Harari, these historical developments that we regard as inevitable when we look into the past from the standpoint of the present, are not in fact inevitable. Because the flow of history is not deterministic; it is chaotic.

But Harari confuses two things here. First, being deterministic and chaotic are not two mutually exclusive things. A phenomenon might be chaotic in the sense that it includes countless components that interact with each other that we don’t know exactly what these components are and their relationships with each other. But it could be deterministic anyhow, in the sense that it may evolve only in one direction as a result of all the factors that interfere in its evolution. The fact that we don’t know exactly what those factors are and how they interact with each other

²⁰ Ibid, page 267.

doesn't mean that this phenomenon isn't under the influence of a deterministic process and may evolve only in one direction.

The development of societies is chaotic. Because in that process myriad of factors are included that we don't know exactly what they are, how they interact with each other, and what might be the exact consequence of their interaction. The flow of history is unpredictable (and as a corollary to that it is also uncontrollable) because of that. But this doesn't mean that it isn't deterministic at the same time, that every factor has the same power of influence on its flow, that it is only pure chance that a specific religion or capitalism or a certain political structure is predominant today.

As Harari himself acknowledges, human societies, from a broad and long-term perspective, have a tendency of getting bigger (demographically and geographically) and more complex. We have reached a point where virtually all of humanity is living in a globally integrated human society. Material factors (energy and material resources, technological tools, demography, fauna, and flora of certain environments) have deterministic priority in shaping this evolution of human societies. Because imagination isn't a constraint in this process. Humans might imagine whatever they want, but their societies need to be physically integrated in order for that tendency to realize itself. They need to have adequate technological means to sustain a certain level of integration. It might be true that some other religion could be in the place of today's Christianity. But this wouldn't change today's society in a fundamental way. Because we can with confidence claim that this other hypothetical religion would also preach basic Christian values such as fraternity among people, equality, meekness, compassion, cooperation, etc. Since these are the values that are necessary to integrate a large number of people who don't know each other directly and don't have the natural inclination to cooperate with each other in a cooperative network. The development of technology integrates physically human communities into larger units, and necessary ideas and values for this unification follow this process.

Harari discusses the concept of memes. According to this concept, ideas (memes) are subjected to a Darwinian selection process. Ideas that are more suitable to spread themselves in the brains of humans are those ideas that spread more successfully and broadly and become dominant ideas. Ideas self-replicate themselves in the minds of people without any concern for the welfare of people. Harari gives the example of the arms race between India and Pakistan. According to the memetic explanation of this situation, the idea of the "arms race" has taken a more dominant place in the minds of Pakistani and Indian people instead of "peace with neighbors." For this reason, they expend a considerable amount of their wealth in an arms race instead of using the same resources on health, education, etc. This line of reasoning is the refashioned version of the old idealist approach to historical development. It attributes deterministic power to ideas as if they developed and spread independently of material factors. In fact, what is in competition in the case of India and Pakistan aren't ideas or memes, but India and Pakistan themselves as states. They feel the need to arm themselves not because the idea of an "arms race" invaded the brains of their citizens, but because violence is a method that organisms/self-propagating systems (states, corporations, etc.) use in order to survive or gain advantage in the Darwinian competition. They use it to protect themselves against attacks or to attack other organisms and systems in order to monopolize resources, preempt some possible attacks, etc. Besides, what is the explanatory power of memetics? How would it explain why the idea of "arms race" spreads more successfully than the idea of "arms control" without making use of some underlying material reasons making this so?

4. Scientific Revolution

Harari claims that the growth in human power from the 16th century to the present is the consequence of the Scientific Revolution. What he means by the Scientific Revolution is a change of attitude towards knowledge. According to Harari, prior to the Scientific Revolution, people thought that the grand narratives they believed explained everything important enough to be known. But thanks to the Scientific Revolution people have realized their ignorance. They have begun to acknowledge their ignorance and embarked upon a systematic quest for knowledge. Modern science doesn't claim that it has all the answers to the riddles of the universe. It only claims that it has tentative best explanations of the current observations. Further observations and new theories that better explain these observations may replace existing theories. Therefore, modern science constantly renews itself and expands the knowledge of humanity.

What Harari means by the "growth in human power" is the enormous increases in the world population and GDP; the technological developments in transport, communication, construction, aviation, and space technologies; the new discoveries in biology and physics (the discovery of microorganisms, the invention of the atomic bomb); etc. And he presents all these transformations as a result of this shift of perspective toward knowledge. All human history since the 16th century is a great narrative of genius ideas following one another. He never mentions the material factors that have pushed human societies towards this complexification.

Harari says that "our current assumption that we do not know everything, and that even the knowledge we possess is tentative, extends to the shared myths that enable millions of strangers to cooperate effectively."²¹ Modern technological society, as any other complex human society, needs a myth, a narrative that would bind the individuals who constitute it in a coherent whole. Since modern science doesn't presume such grand narratives, this might threaten the dominant ideology of modern technological society. The new findings of modern science might belie the dominant ideology.²² According to Harari, modern humanist ideologies have two options to face this threat. They can claim that a scientific theory has found a definitive truth, and build a world-view on top of that. This is what Nazism and Communism do. Or, as liberal humanism does, they can prefer to draw a line between their narrative and the theories of modern science. According to liberal humanism, human beings are unique and they have absolute inalienable rights. But this is not what modern evolutionary biology says. It says that human beings are evolved biological organisms just like other species. But as Harari himself mentions, the line liberal humanism draws between its myth and modern science is not so sharp. The notion of "progress" is one of liberal humanism's constituent pillars. According to this, scientific and technological development is always something good; they always take humanity to a better future; current economic, social, and ecological problems will be solved with their help.

Harari tries to be seen as neutral while discussing modern-day myths. But in fact, it is pretty obvious that he accepts the notion of "progress" and values of liberal humanism. One manifestation of this is that he attributes virtually all of the developments (social, economic, technological,

²¹ Ibid, page 282.

²² This is actually what happens with anthropology, evolutionary biology/psychology, and ecosystem science. Anthropology and evolutionary biology/psychology, in contrast to humanist narratives, have placed humans in the animal kingdom among other species. They explained that we acquired our physical/psychological needs during the evolutionary process, and we need to live in our natural habitats to have a satisfying and fulfilling life. Ecosystem science has demonstrated that social complexification, Harari's "growth in human power" and humanism's "progress," destroy wild ecosystems and undermine the ground which supports that complexification.

scientific) since the 16th century to a shift in mentality (the Scientific Revolution) and the ensuing succession of creative ideas. This basically amounts to claiming that humanity, thanks to its genius ideas and new excellent mentality, has been going further in the path of progress in an accelerated fashion since the Scientific Revolution and will continue to do so in the future and will eventually turn into a god—*Homo deus*. There is no mention of the material factors that are involved in this process. He doesn't mention at all the physical relations human societies have with Nature, and how technology acts as an intermediary in this relation. We can't hear anything about how human societies have reached the limits (carrying capacity) of their environments, and how new technologies have been employed to move these limits further in order to avoid collapse. These new technologies are more of a solutions to the problems bequeathed to human societies by the previous technological development (social complexification) than they are fancy ideas that humans come up with thanks to their new perspective. They represent further steps of a *fuite en avant*, more intensive ways of doing things with more energy and material. GDP has started to increase in an accelerated fashion since the 19th century and the material conditions of humans have also started to increase (the elimination of poverty, the increase of welfare) during this time. These developments are the consequences of the Industrial Revolution which were triggered as a reaction to the fact that Western European agricultural societies reached their carrying capacities at that time. Without the enormous concentrated energies that have accumulated as fossil fuels, no amount of genius ideas would be sufficient enough to realize the technological, scientific, and social development that has happened since then. But all these developments in turn create new problems: they create a society that is further detached from the natural living conditions of humans, and they worsen the environmental problems since they require ever more consumption of energy and materials. Harari, as an unrelenting progressivist he is, prefers to see the prospective technological palliatives (genetic engineering, cyborgization) to the first category of these problems (an artificial environment that is further detached from Nature and the natural inclinations of humans) as the transformation of *Homo sapiens* to *Homo deus*. We will return to this point below.

As we said above, Harari tries to appear impartial with regard to modern-day narratives. He tries to present himself as an impartial observer of the history of *Homo sapiens*. But his remarks on the developments in medical technology belie this attitude. According to Harari, what the medical profession, in reality, aspires to is to realize immortality. He says that thanks to the Scientific Revolution, serious progress has been made towards this goal in recent times. In the future, new technologies such as genetic engineering and nano-robots that support the immune system will usher even bigger progress in reaching that goal. Harari says that these are all good developments.²³ But why is it a good thing that as many *Homo sapiens* as possible live an immortal life that is further detached from their natural inclinations and habitat? Especially when we think about what this immortality would entail: an even worse overpopulation, further collectivization of the society, a further deterioration of the natural immune capabilities of humans which would make them completely dependent on the medical profession, and all the negative consequences of these on wild Nature. One can only see these as good if one accepts the dogmas of modern leftist humanism.

Harari constructs an idealist narrative of history. According to him, the fact that it was Europeans who made the geographical discoveries, that they rapidly made numerous technological

²³ Ibid, page 301.

advances and put them into use is due to the peculiar mentality that Europeans acquired during the Scientific Revolution: “The oddity is that early modern Europeans caught a fever that drove them to sail to distant and completely unknown lands full of alien cultures, take one step on to their beaches, and immediately declare, ‘I claim all these territories for my king!’”.²⁴ Chinese didn’t do these discoveries because they didn’t have the same mentality. Even if they had the technological capability, they didn’t put it into use in a broad manner that would transform their society.

To illustrate the uniqueness of modern Europeans (the Europeans of the post-Scientific Revolution era), Harari contrasts them with past conquerors (Roman and Alexandrian Empires). Past conquerors merely expanded their territory to neighboring territories; they didn’t venture into unknown seas and lands to claim sovereignty over them. It is true that past empires expanded their territories to adjacent land masses. Roman, Alexandrian, Ottoman, and Russian empires had the tendency of expanding their territory to neighboring territories. There are some deep reasons (apart from their own ideological legitimizations) why they had this tendency. Because they were in a competition to absorb more energy and material resources to accumulate more material capacity and gain an advantage in the context of the Darwinian competition they engage with other large organizations (other states or empires). Because of this fundamental and unconscious competition among large organizations, they have the tendency to enlarge their operations throughout the area that it is possible to control with a given technological level.

Prior to the advent of the complex human organizations such as the agricultural empires that we mentioned above, human hunter-gatherer communities had expanded from Africa to virtually every part of the world (except Antarctica) including Australia. Of course, whereas modern Europeans knew that they were colonizing “new” continents, hunter-gatherers weren’t aware of where they were going. Despite this difference, we may still ask this question: Hunter-gatherer communities that had expanded to every continent of the world except Antarctica had also been the victim of this fever that seized Europeans during the Scientific Revolution? Or, more plausibly, as these hunter-gatherer communities had reached the carrying capacities of their environments, had they been forced by their circumstances to expand to adjacent territories? As hunter-gatherer communities colonized every part of the world where this economy is possible, this lifestyle reached its global carrying capacity. There was virtually no more empty land to expand as a hunter-gatherer. When this stage was reached, food-producing communities started to pop up independently in the most suitable locations for agriculture. Since these food-producing societies were able to produce more energy and feed bigger populations, they started to expand from their initial zones to adjacent territories and colonized virtually every suitable land for agriculture. Perhaps these traditional agricultural societies were also seized by this fever that afflicted early modern Europeans?

Early modern era European discoveries and colonizations were not fundamentally and qualitatively different from the prior expansions that we mentioned above. Prior to the early modern era discoveries, the Eurasian landmass was filled with societies that had more or less the same level of complexity, the same level of technological development. There was an uninterrupted chain of civilizations from the Atlantic to the Pacific Ocean. The societies of Western Europe, since the late middle ages, reached the carrying capacity of their land. Europeans were squeezed to the extreme fringe of the Eurasian land mass that was also closest to the American continent.

²⁴ Ibid, page 325.

The central part of the Eurasian landmass was under the control of rival civilizations (Ottomans and Persians in the Middle East, Mughal Empire in India). Europeans didn't have the chance to expand eastward to ease the pressure of over-population, so they made an attempt to venture outside and started geographical discoveries.

Harari sees the Industrial Revolution and its consequences as the results of human ingenuity and the unique European modern mentality. Uninterrupted genius ideas and inventions that follow one another and which helped people to shape human societies and material conditions to their will at last ushered also the Industrial Revolution. Harari claims that our energy and material resources are limited only in theory, in practice, they are limitless.²⁵ He tries to back this claim with several examples. In the 18th century, carriage production was dependent on wood and iron. But today, we use numerous materials such as plastics, rubber, aluminum, and titanium most of them were unknown in the 18th century and only discovered in recent decades. Whereas in the 18th century carts were produced in factories that were powered by muscle power (human and animal) and were moved by animal muscle, today's automobiles are being produced in factories that are powered by fossil fuels or nuclear energy and moved by internal combustion engines that burn fossil fuels. The conclusion Harari derives from this is that what is limited is not the energy or materials themselves, but the knowledge to acquire and transform them. It is true that throughout the technological development and the ensuing complexification of societies, humans have added new materials and energy sources to their repertoire. In terms of energy, humans have used traditional biomass since they discovered the use of fire, and they have added on this coal, oil, nuclear, modern solar panels, and wind turbines. In the domain of fossil fuels, we now exploit hitherto untapped reserves of fossil fuels such as shale deposits, tar sands, and deep ocean reserves. Wind turbines started to invade the seas in the shape of off-shore turbines. The petrochemical industry is synthesizing new materials. But all these discoveries and inventions mean increased complexity, and they all represent a reaction to a previous intensification-depletion process. In order to reach, produce, process, and synthesize these "new" energy and material resources, we need to employ ever more complex processes and invest more energy and matter in these processes.

Humanity is using now nuclear energy, but in order to achieve this feat we need to mine uranium and enrich it (a very difficult and expensive process), build massively complex and expensive nuclear power plants, and operate those plants with utmost security (train relevant cadres, determine and implement security measures, etc.), and find a way to store the extremely dangerous and harmful nuclear waste virtually for eternity. Until today, we have continued to find new reserves of fossil fuels. But each time, they are in the places which are harder to reach (in deep oceans, in shale rocks, etc.), or they are the types that are harder to process and less energy-dense. Sunlight that reaches the earth and winds that are formed in the atmosphere may hold a virtually limitless amount of energy as potential, but we need to harness this energy in order to use it. And this is only possible with the expenditure of enormous quantities of energy and materials and their transformation involving complex procedures: Mining of the rare earth minerals that are used in the production of solar and wind turbines, the production of the solar panels and wind turbines themselves, their installation in remote areas and operating those as power plants, etc. The new synthetic materials that we keep inventing are also subjected to similar processes and constraints. Their production requires more and more energy and material

²⁵ Ibid, page 374.

resources, and we employ ever more complex procedures in order to produce them. Therefore, these “new” materials and energy sources aren’t free products of human ingenuity that are drawn from the void as Harari wants to present them, but they are more of a response to problems that have been bequeathed to us from past intensification-depletion cycles. The use of coal was a response to the fact that wood sources were depleted in the British Islands. The exploitation of solar and wind power by modern solar panels and wind turbines is a reaction to the depletion of fossil fuel reserves, and a desperate attempt to curtail the CO₂ emissions that change the climate of the Earth. Artificial fertilizers represent a phase in an intensification process that has been going on for thousands of years and represent a remedy to the consequences of this intensification process (increased population levels and depletion of minerals in the soil and its erosion). Of course, the production and exploitation of all of these “newly discovered” energy and material resources constitute wider and deeper interventions to the wild processes which create even greater problems and force us to find even more “new” energy and material resources.

Harari investigates the effects of the Industrial Revolution on domesticated animals. The wild genetics of these animals had already been altered since the Agricultural Revolution. With the advent of the Industrial Revolution and the application of its techniques to food production, these species have become the raw materials of a much more mechanic and calculated process. They spend their whole lives in the production chain of industrial assembly lines. As a consequence, they suffer enormous physical and psychological pains. As Harari mentions, these animals still have needs that they acquired during their wild evolutionary history: “This is the basic lesson of evolutionary psychology: a need shaped in the wild continues to be felt subjectively even if it is no longer really necessary for survival and reproduction. The tragedy of industrial agriculture is that it takes great care of the objective needs of animals while neglecting their subjective needs.”²⁶

This statement also points to the core reason for the sufferings humans endure in the techno-industrial system. The activities that humans would normally engage in order to survive and reproduce have become unnecessary in a technological society. But the need to engage in these activities is still felt by humans.

The physical and social environment *Homo sapiens* live in has been transformed very rapidly and fundamentally since the Industrial Revolution. The wild Nature that we evolved inside is being rapidly substituted by the artificial environment the technological system creates. The advent of the Industrial Revolution has brought a more radical departure from our natural habitat than the Agricultural Revolution brought. During the traditional agricultural societies, humans had at least a more direct relation with the natural environment (with the sun, soil, and water), they lived in a less collective society as members of a smaller group, and they lived a life that was more steady and slow and thus was capable of offering a sense of stability and trust. The social consequences of the Industrial Revolution have wiped all these away.

The industrial mode of production has subjected the time that was organized according to the sunlight and seasons to the rational calculation of the clock. Factories have reduced people to little peons that undertake minutely defined mechanic jobs. Schools, government, and private offices have also applied the same principles. Urbanization has created the most unnatural form of life by bringing millions of people together in vast concrete conglomerations. The destruction of the extended families and the local small communities reduced people to isolated individuals. *Homo sapiens* lived for hundreds of thousands of years in small communities and adapted to the

²⁶ Ibid, page 385.

lifestyle (cooperation networks, a sense of belonging to a tribe, a common culture, and language, etc.) these communities provide. The rapid dissolution of these communities creates a strong feeling of loneliness, isolation, and powerlessness.

Harari mentions the myth of the “individual” that is being used by the technological system in its campaign of propaganda against extended family and small communities. However, it seems that he himself swallows this propaganda and claims that the “individual” is a phenomenon that has been created by modern conditions.

Modern technological society has encouraged people to shatter their connections with their extended families and small communities with the promise of making them “individuals:” You can marry whomever you want without asking your elders, you can do whatever job you want and settle wherever you like away from your family and traditional community. The services such as cooperation, security, food, sheltering, education, etc. that have been so far provided by traditional small communities will be provided to you by the state and the market (corporations). You will be modern and free individuals by getting out of backward traditional settings.

Despite the fact that Harari sees this narrative as a fifth-column propaganda activity that aims to destroy family,²⁷ he accepts the content of this propaganda. Because he claims that modern conditions create strong individuals.²⁸ It is not clear what he means by “strong individuals.” Strong for doing what? What does he mean by being “individual?” How can millions of people who have virtually the same pleasures, values, beliefs, and worldviews that are inculcated to them by mass propaganda, whose working and leisure hours are designed by technical necessities and market mechanisms can be real individuals? How can people whose basic necessities are met by large organizations as long as they remain docile and tame, and who are followed and recorded virtually in every aspect of their lives be strong?

Happiness and the Purpose of Life

Harari ventures into a discussion on happiness and the purpose of life. He says that social development and advancement in science and technology can’t automatically bring happiness to people. He claims that the opposite of this idea is also not correct. What he means by the opposite idea is the opinion that claims that humans evolved during a hunter-gatherer lifestyle; our physical and psychological needs and desires were shaped during that process, and each further social development that moves us away from this lifestyle makes us unhappy. According to Harari, this opinion is as dogmatic as the first one because it ignores the advancements the technological development has brought such as the decline in infant mortality rate and violence, and the disappearance of large-scale famines.

Harari advises us to entertain a more nuanced view instead of these two opposite extremes. According to Harari, we shouldn’t be dogmatically reactionary or dogmatically progressive while evaluating the consequences of technological development. Instead, we should evaluate the bad and good parts of each side. Despite the fact that technological development moves us away from the lifestyle that we have evolutionarily adapted to, it also brings some positive results.

²⁷ “In order really to break the power of family and community, they needed the help of a fifth column.” Ibid, page 402.

²⁸ See the diagram on page 405.

But this “nuanced” stance Harari suggests us to take doesn’t have any practical relevance and it is based on an inadequate comparison of the two lifestyles (hunter-gatherer lifestyle and modern technological lifestyle). First of all, as Harari himself mentions in the succeeding pages, the above-mentioned advances that technological development has brought have only appeared during the last several decades. This only constitutes the tiniest bit of human history. Moreover, these “advancements” are only possible with the thorough destruction of the planet’s ecosystems. These “advancements” are cutting the very branch they sit on. They might be laying the foundations of unprecedented misery and insecurity.

More importantly, Harari devises this comparison as if it were possible to choose from the good parts of each lifestyle. As if we (the vast majority of people alive) had the chance to experience the positive aspects of the hunter-gatherer lifestyle today in the techno-industrial system. The lifestyles Harari compares are total packages with their “good” and “bad” parts inseparable from each other. Technological development, by thoroughly modifying every aspect of society, forces people to lead a certain kind of lifestyle and destroys other alternatives. The techno-industrial society, with each technological advancement, encroaches on us in our daily lives and shapes our lives according to its needs. Even the most stubborn among us can escape from these encroachments only to a certain extent. Since we have to accept the “good” and the “bad” parts of technological development altogether, what this nuanced view would amount to? At best, it would only amount to the passive acceptance of ever more technological encroachment.

Harari discusses the results and implications of some recent studies on happiness. Psychologists ask people to rate their feelings about themselves, their lives, and their future. And they evaluate the results by linking the answers to the backgrounds (their family life, income, religious belief, health, etc.) of the participants. The results of these studies indicate that material factors (income, the physical things a person has, etc.) can only bring happiness to a certain extent. This means that after a point where the basic physical necessities are satisfied, the increase in material well-being has a decreasing marginal benefit in terms of “happiness.” Sickness brings unhappiness in the short term. But if it doesn’t involve chronic pain, and the condition of the sick person doesn’t deteriorate in time, people get used to their new condition. After this point, sickness stops being a factor in “happiness.” Another discovery of these studies is that the sense of actively belonging to a group (family or a community) is more important than health, and money (material well-being). The most important finding of these studies is that “happiness” isn’t dependent on the objective conditions of wealth, health, or belonging to a community, but on the correspondence between the objective conditions and the subjective expectations about these conditions.

Despite the fact that these findings support the “dogmatic” view that people become “unhappy” as we move away from our evolutionary adapted lifestyle, Harari doesn’t want to reach that conclusion, or he doesn’t want to explicitly state that. On page 428, he acknowledges that “the immense improvement in material conditions over the last two centuries was offset by the collapse of the family and the community.” Moreover, “happiness” is mostly dependent on expectations. Past people didn’t have the material conditions of today’s people. They didn’t expect to have air-conditioned apartment flats, automobiles, smartphones, subscriptions to streaming services, modern healthcare facilities, etc. Therefore, it is absurd to put all these material “advancements” on one scale to compare the happiness of modern and pre-modern people in order to have our “nuanced” opinion.

But Harari omits to mention the most important thing in all this discussion of “happiness” and the meaning of life. This is the factor that bestows to an individual the feeling of satisfaction and purpose in his life: the power process. People “need to have goals whose attainment requires effort, and needs to succeed in attaining at least some of these goals.”²⁹ To satisfy this need in a proper manner, they need to go through the power process autonomously. This means they need to undertake the efforts necessary to reach their goals with their own physical and mental capabilities as individuals or as part of a small group. The psychological satisfaction people receive during the power process is proportional to the importance of the goals achieved. Therefore, if the goals pursued are related to the core physical necessities (food, shelter, physical safety, etc.), the satisfaction one would get from attaining these goals would be higher than achieving more trivial goals. In a modern technological society, people function as mere peons in giant organizations. Their day-to-day jobs aren’t related to their immediate physical necessities. Moreover, the tasks they do are totally divorced from the end product since specialization is pretty advanced in modern society. Thus, they procure their basic necessities with absurd and abstract tasks that don’t stimulate them physically or psychologically. This condition robs the means and conditions of their lives from their own hands. Instead of their own mental and physical capabilities, they depend on large organizations to procure their most basic necessities. Since they don’t use their abilities in an active and purposeful manner, they feel insecure and purposeless.

Perhaps in order to avoid to reach to the logical conclusions of his discussions and to refrain from discussing the most important aspect (power process) in all of this, Harari starts to discuss brains, neurons, and hormones. According to biologists “our mental and emotional world is governed by biochemical mechanisms shaped by millions of years of evolution. Like all other mental states, our subjective well-being is not determined by external parameters such as salary, social relations, or political rights. Rather, it is determined by a complex system of nerves, neurons, synapses, and various biochemical substances such as serotonin, dopamine, and oxytocin.”³⁰ Thus, we are not made happy by external circumstances or what we do and achieve in our lives; we are made happy by one thing only—pleasant sensations in our bodies.

Pulling the discussion on happiness to a deeper level of complexity (brains, neurons, chemicals, hormones, etc.) doesn’t exonerate the effects of the external circumstances on our psychological well-being. Because hormones and electrical currents in our brains don’t sway randomly. These are motivational mechanisms that have evolved in our evolutionary past to motivate and guide us to behaviors that would increase our chances of survival and reproduction. As we successfully and consistently do things that increase our chances of survival and reproduction, we feel happy and satisfied. Being physically and mentally active, and going through the power process adequately is one of the most important things that we need to be doing in order to feel satisfied and happy.

Besides, equating “happiness” with the sensations that hormones and electrical currents create in our brains is to reduce it to pleasure. Happiness is something broader than that. “Happiness is not the surplus of pleasant over unpleasant moments. Rather, happiness consists in seeing one’s life in its entirety meaningful and worthwhile.”³¹ But Harari doesn’t apply this criterion to his comparison of hunter-gatherer and modern lifestyles. He can only cite the improvements in ma-

²⁹ Theodore John Kaczynski, *Industrial Society and Its Future*, ¶ 33.

³⁰ *Ibid*, page 432.

³¹ *Ibid*, page 437.

terial conditions as the benefits of technological development. But the technological development changes our lives in such a fundamental way that it robs the meaning from them by eliminating the possibility of going through the power process. It turns us into atomized individuals by pulverizing the small-scale communities. It may be giving us a materially more comfortable life, but “a meaningful life can be extremely satisfying even in the midst of hardship, whereas a meaningless life is a terrible ordeal no matter how comfortable it is.”³²

Harari says that “from a purely scientific viewpoint, human life has absolutely no meaning.”³³ From the examples that he gives on the same page, we see that he searches for this meaning in an ideological narrative (religious or secular). “Any meaning that people ascribe to their lives is just a delusion. The other-worldly meanings medieval people found in their lives were no more deluded than the humanist, nationalist and capitalist meanings modern people find.”³⁴ But these ideological narratives (axial religions such as Christianity, Islam, or Buddhism; or their modern offshoots such as Liberalism, Socialism, or Anarchism and Communism) are reactions to the fact that we got separated from our natural habitats and lifestyle (nomadic hunter-gatherer life in wild Nature). They are trials for substituting the lost meaning artificially (knowing thyself, reaching nirvana, realizing oneself, going to heaven, reaching Truth, trying to create the most perfect society on earth, etc.) which –if it works at all– only work for a very small number of people.

Harari doesn’t discuss the recent findings of anthropology and evolutionary biology/psychology in all this. *Homo sapiens* evolved during a long nomadic-hunter gatherer existence. As living organisms that have been shaped by evolution, our purpose is to ensure the survival of our genes and we can do this by increasing our reproductive success. Of course, this in itself doesn’t give meaning to our lives. Because nobody consciously takes the perpetuation of his genes as a purpose in his life. However, natural selection devises some proximate goals that would foster the survival of our genes in the end. In order to increase our reproductive success, we need to stay alive and appear attractive to the opposite sex. We need to satisfy our physical needs to stay alive. And better we satisfy them, the healthier and more attractive we appear. Other qualities such as good social skills, talent in hunting and war-making, courage, self-confidence, etc. also improve our reproductive success. When we accomplish the tasks that increase our reproductive success by going through adequately the power process, we feel confident, satisfied, and happy. All these motivations and behavioral patterns were shaped during our long nomadic-hunter gatherer existence. People were doing the things that would increase their reproductive success autonomously, using their mental and physical abilities individually or as part of a small group. They needed to control and govern the most important things in their lives using their own capacities. Since nomadic hunter-gatherer people were living the meaning and purpose in their daily lives, it seems that they didn’t have the need to search for this meaning in lofty ideals of ideological narratives. It seems that they knew what was the meaning.

³² Ibid.

³³ Ibid, page 438.

³⁴ Ibid.

The End of Sapiens

Harari says that we might be living the last days of *Homo Sapiens* as a species that is shaped by natural selection. Because humanity is fast devising techniques that are allowing it to design and create artificial biological organisms or purely artificial autonomous lives. Perhaps the scope of this change would be broader than the end of *Homo sapiens* because what is at stake is the totality of the living things.

Harari discusses three avenues that have the possibility to supersede natural life (life that has evolved in the context of natural selection) and replace it with artificially designed life.

1. Biological engineering

This is the deliberate intervention to the building blocks of life: DNA. Scientists have now the ability to modify the DNA and create artificially designed organisms. However, creating artificial chimeras is still disconcerting for many people. That is why the enormous potential of genetic engineering³⁵ is being used now for some unspectacular economic concerns: making potatoes more frost resistant, making wheat ever more resistant to ever stronger herbicides, inducing pigs to produce omega-3 acids instead of omega-6 acids, etc.

Genetic engineering has the potential to transform human beings. Intervening in the DNA of humans is taboo right now. Apart from some religious, ethical, and political concerns, the uncertainty about whether genetic engineering would produce the desired results, and fears that its side effects might be greater than its benefits also restrict the application of these techniques to a limited area. However, some probable future improvements in the techniques of genetic engineering such as the effective treatment of currently incurable diseases would open a breach in this restriction and further encroachments would only follow. Moreover, further transformations in the structure of human societies and the deeper deterioration in the planet's ecosystems that will surely follow the new technological developments might create additional motivations for the application of genetic engineering: adjusting humans to the new social and technological developments, offsetting the effects of endocrine disruptors by directly intervening to the hormonal system, attempts to control the propagation of depression and anxiety by manipulating the nervous system, designing coral reefs that would be resistant to higher temperatures, recreating extinct species, fighting invasive species by genetic manipulation, etc.

2. Cyborg Engineering

Another area that is creating artificial life is cyborg engineering. It involves the merging of humans and also other animals with inorganic parts. There are currently implants that substitute or enhance sense organs or function as limbs. Apart from these mechanical interventions, there are projects that investigate the possibilities of fusing computer processors with the human brain. Armies are using insects to collect intelligence, and there are attempts to remotely control various animal species.

There are also other avenues that progressively merge humans with inorganic parts. People are spending increasingly more time glued to electronic stimuli: smartphones, laptops, PCs, gaming consoles, TVs, etc. We also shouldn't forget the wearable industry: smart watches, googles,

³⁵ It is needless to say that we regard this potential abhorrent and a huge threat to wild Nature.

rings, and straps that measure all sorts of data such as heart rate, sleeping patterns, blood chemistry, etc. Most people wouldn't consider these as further merging with inorganic parts, but they nevertheless represent an incremental merging of humans with artificial objects and insulation of humans from the natural world and their isolation in an artificial existence. With the proliferation of the wearable industry, more and more aspects of the human body are coming under the surveillance of technology, more data is gathered from humans, and this data is evaluated by machine learning algorithms to nudge humans to "healthier" lifestyles. The fact that all these electronic devices have become an essential part of modern daily life shows us how easily and quickly might go further cyborgization process: Humans are already accustomed to living with electronic appendages that shut them down in an artificial world.

Harari prefers to ignore this fact, but the most important force that is driving the cyborgization and the genetic reengineering of humans is the fact that humans are becoming obsolete as technological development transforms each passing day more deeply the society and natural world. Natural selection hardly operates now on humans. As a result, their genetic makeup deteriorates with each passing generation. These defects should be remedied by all sorts of artificial hearing, visual, or cardiac implants. Societal transformations that have been brought by technological development are making human capabilities more out-of-date, and innate human behavioral inclinations are becoming more inadequate for our technologically advanced society. That is why we frequently hear today that humanity should enhance itself artificially if it doesn't want to be superseded, or people increasingly feel the need to nudge their behavior to "healthy" choices.

Therefore, modifying humans artificially through genetic engineering or merging it with inorganic parts is not a "cheerful" aspiration to reach the status of "*Homo deus*" as Harari wants to present it. But it is more of a desperate attempt to keep humans relevant in this rapidly changing world. It stems not from a standpoint of self-confidence, but from an uneasy premonition that our time is coming to an end. But it seems that Harari prefers to have a happy ending for his narrative, and presents this possible elimination of humanity as transcendence to *Homo deus*.

3. Artificial Intelligence

The third avenue to create artificial life is to engineer it from the scratch as total inorganic beings. This is the good old artificial intelligence. Harari enumerates recent advances in artificial intelligence technology. He especially emphasizes the machine learning algorithms, how these algorithms have the capacity of self-learning, and how they bestow on machines the capability of autonomy. Today, there are machines that are able to play chess, drive cars, diagnose diseases, invest money in the stock market, etc.

As Harari also rightly points out, these three areas of technological development have the potential of rendering obsolete the age-old philosophical, religious, political, and ethical problems. Because these developments can bring in a near future where humans might be transformed into beings that would be totally different as we know them, they can be supplanted outright by pure inorganic beings, or they can be reduced to a state of total servility and passivity as curious relics of an ancient time. These new beings will have conscious, emotional, and physical qualities that would be totally different from humans. Harari rightly claims that this highly probable future should change all our current discussions. But these possibilities are hardly discussed in a serious fashion in the mainstream. The vast majority assume that humans will remain as

they are today in an extremely advanced technological society, and the problems that occupy the mainstream of society will remain as they are now.

These observations of Harari are accurate, but the context he would like to base the discussion on these issues isn't. Harari says that, if our days are numbered, we should answer the following question: What do we want to become? But this question has no meaning at all. He seems to think that public discussion can steer science to certain endeavors, and thus, technological development can be directed according to our wishes. We can become what we want to be. First of all, who is this "we?" How can there be a consensus about what "we" would like to transform "ourselves" into? What about the ones who would like to maintain their natural character? And the ones who would subject themselves to the insult of changing their natural character, how would "they" control their future transformation? How would "they" know when "they" reached their aim? And how would "they" maintain their new versions?

Future tinkering with biological organisms, including humans, won't be planned and implemented consciously according to a predetermined aim. "We" won't be able to ask questions about what "we" would like to be in the future, and come up with an answer to that question that would satisfy everybody. Even if "we" were to reach a consensus that would satisfy everybody, it wouldn't be possible to realize that, because we don't have the ability to control the development of technology and our societies. Tinkering with biological organisms and the creation of artificial lives will be realized in the context of the Darwinian competition between large organizations (states, corporations, etc.). Large organizations will develop these artificial organisms in the pursuit of their short-term interests. "We" won't be able to control these technological developments and usher desired consequences from them. Therefore, the real question that we have to ask ourselves boils down to this: are we going to let technological development supersede humanity; replace us with genetically engineered monstrosities, cyborg chimeras, autonomous machines, or some combination of these; to substitute human beings and remaining wild Nature with a completely artificial system; or, more plausibly, a near-death planet due to thorough destruction of the planet's biospheric functions; *or* are we going to put a stop to all these and save our human nature with the rest of wild Nature. That is the only practical choice we have now.

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