

Sapiens

a brief history of humankind

by

Yuval Noah Harari

Grade 1.

100,000 years ago, at least six human species inhabited the earth. Today there is just one. Us. Homo sapiens. How did our species succeed in the battle for dominance? Why did our foraging ancestors come together to create cities and kingdoms? How did we come to believe in gods, nations and human rights; to trust money, books and laws; and to be enslaved by bureaucracy, timetables and consumerism? And what will our world be like in the millennia to come? In *Sapiens*, Dr Yuval Noah Harari spans the whole of human history, from the very first humans to walk the earth to the radical – and sometimes devastating – breakthroughs of the Cognitive, Agricultural and Scientific Revolutions. Drawing on insights from biology, anthropology, palaeontology and economics, he explores how the currents of history have shaped our human societies, the animals and plants around us, and even our personalities. Have we become happier as history has unfolded? Can we ever free our behaviour from the heritage of our ancestors? And what, if anything, can we do to influence the course of the centuries to come? Bold, wide-ranging and provocative, *Sapiens* challenges everything we thought we knew about being human: our thoughts, our actions, our power ... and our future.

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Our own species, Homo sapiens, was already present on the world stage, but so far it was just minding its own business in a corner of Africa. We don't know exactly where and when animals that can be classified as Homo sapiens first evolved from some earlier type of humans, but most scientists agree that by 150,000 years ago, East Africa was populated by Sapiens that looked just like us. If one of them turned up in a modern morgue, the local pathologist would notice nothing peculiar. Thanks to the blessings of fire, they had smaller teeth and jaws than their ancestors, whereas they had massive brains, equal in size to ours.

Scientists also agree that about 70,000 years ago, Sapiens from East Africa spread into the Arabian peninsula, and from there they quickly overran the entire Eurasian landmass.

When Homo sapiens landed in Arabia, most of Eurasia was already settled by other humans. What happened to them? There are two conflicting theories. The 'Interbreeding Theory' tells a story of attraction, sex and mingling. As the African immigrants spread around the world, they bred with other human populations, and people today are the outcome of this interbreeding.

For example, when Sapiens reached the Middle East and Europe, they encountered the Neanderthals. These humans were more muscular than Sapiens, had larger brains, and were better adapted to cold climes. They used tools and fire, were good hunters, and apparently took care of their sick and infirm. (Archaeologists have discovered the bones of Neanderthals who lived for many years with severe physical handicaps, evidence that they were cared for by their relatives.) Neanderthals are often depicted in caricatures as the archetypical brutish and stupid 'cave people', but recent evidence has changed their image.

According to the Interbreeding Theory, when Sapiens spread into Neanderthal lands, Sapiens bred with Neanderthals until the two populations merged. If this is the case, then today's Eurasians are not pure Sapiens. They are a mixture of Sapiens and Neanderthals. Similarly, when Sapiens reached East Asia, they interbred with the local Erectus, so the Chinese and Koreans are a mixture of Sapiens and Erectus.

spearhead was manufactured in minutes by a single person, who relied on the advice and help of a few intimate friends. The production of a modern nuclear warhead requires the cooperation of millions of strangers all over the world - from the workers who mine the uranium ore in the depths of the earth to theoretical physicists who write long mathematical formulas to describe the interactions of subatomic particles.

To summarise the relationship between biology and history after the Cognitive Revolution:

- a. Biology sets the basic parameters for the behaviour and capacities of Homo sapiens. The whole of history takes place within the bounds of this biological arena.
- b. However, this arena is extraordinarily large, allowing Sapiens to play an astounding variety of games. Thanks to their ability to invent fiction, Sapiens create more and more complex games, which each generation develops and elaborates even further.
- c. Consequently, in order to understand how Sapiens behave, we must describe the historical evolution of their actions. Referring only to our biological constraints would be like a radio sports-caster who, attending the World Cup football championships, offers his listeners a detailed description of the playing field rather than an account of what the players are doing.

What games did our Stone Age ancestors play in the arena of history? As far as we know, the people who carved the Stadel lion-man some 30,000 years ago had the same physical, emotional and intellectual abilities we have. What did they do when they woke up in the morning? What did they eat for breakfast - and lunch? What were their societies like? Did they have monogamous relationships and nuclear families? Did they have ceremonies, moral codes, sports contests and religious rituals? Did they fight wars? The next chapter takes a peek behind the curtain of the ages, examining what life was like in the millennia separating the Cognitive Revolution from the Agricultural Revolution.

capabilities and lifestyles. Every other mammal that went to sea - seals, sea cows, dolphins - had to evolve for aeons to develop specialised organs and a hydrodynamic body. The Sapiens in Indonesia, descendants of apes who lived on the African savannah, became Pacific seafarers without growing flippers and without having to wait for their noses to migrate to the top of their heads as whales did. Instead, they built boats and learned how to steer them. And these skills enabled them to reach and settle Australia.

True, archaeologists have yet to unearth rafts, oars or fishing villages that date back as far as 45,000 years ago (they would be difficult to discover, because rising sea levels have buried the ancient Indonesian shoreline under a hundred metres of ocean). Nevertheless, there is strong circumstantial evidence to support this theory, especially the fact that in the thousands of years following the settlement of Australia, Sapiens colonised a large number of small and isolated islands to its north. Some, such as Buka and Manus, were separated from the closest land by 200 kilometres of open water. It's hard to believe that anyone could have reached and colonised Manus without sophisticated vessels and sailing skills. As mentioned earlier, there is also firm evidence for regular sea trade between some of these islands, such as New Ireland and New Britain.¹

The journey of the first humans to Australia is one of the most important events in history, at least as important as Columbus' journey to America or the Apollo 11 expedition to the moon. It was the first time any human had managed to leave the Afro-Asian ecological system - indeed, the first time any large terrestrial mammal had managed to cross from Afro-Asia to Australia. Of even greater importance was what the human pioneers did in this new world. The moment the first hunter-gatherer set foot on an Australian beach was the moment that Homo sapiens climbed to the top rung in the food chain on a particular landmass and thereafter became the deadliest species in the annals of planet Earth.

Up until then humans had displayed some innovative adaptations and behaviours, but their effect on their environment had been negligible. They had demonstrated remarkable success in moving into and adjusting to various habitats, but they did so without drastically changing those habitats.

Archaeologists are familiar with such monumental structures from sites around the world - the best-known example is Stonehenge in Britain. Yet as they studied Gobekli Tepe, they discovered an amazing fact. Stonehenge dates to 2500 BC, and was built by a developed agricultural society. The structures at Gobekli Tepe are dated to about 9500 BC, and all available evidence indicates that they were built by hunter-gatherers. The archaeological community initially found it difficult to credit these findings, but one test after another confirmed both the early date of the structures and the pre-agricultural society of their builders. The capabilities of ancient foragers, and the complexity of their cultures, seem to be far more impressive than was previously suspected.

13. Opposite: The remains of a monumental structure from Gobekli Tepe. Right: One of the decorated stone pillars (about five metres high).

Why would a foraging society build such structures? They had no obvious utilitarian purpose. They were neither mammoth slaughterhouses nor places to shelter from rain or hide from lions. That leaves us with the theory that they were built for some mysterious cultural purpose that archaeologists have a hard time deciphering. Whatever it was, the foragers thought it worth a huge amount of effort and time. The only way to build Gobekli Tepe was for thousands of foragers belonging to different bands and tribes to cooperate over an extended period of time. Only a sophisticated religious or ideological system could sustain such efforts.

Gobekli Tepe held another sensational secret. For many years, geneticists have been tracing the origins of domesticated wheat. Recent discoveries indicate that at least one domesticated variant, einkorn wheat, originated in the Karacadag Hills - about thirty kilometres from Gobekli Tepe.⁶

This can hardly be a coincidence. It's likely that the cultural centre of Gobekli Tepe was somehow connected to the initial domestication of wheat by humankind and of humankind by wheat. In order to feed the people who built and used the monumental structures, particularly large quantities of food were required. It may well be that foragers switched from gathering wild wheat to intense wheat cultivation, not to increase their normal food supply, but rather to support the building and running of a temple. In the conventional picture, pioneers first built a village, and when it prospered,

Babylon. Instead, he might have built for her the sumptuous tomb she had always wanted.

18. The Great Pyramid of Giza. The kind of thing rich people in ancient Egypt did with their money.

Like the elite of ancient Egypt, most people in most cultures dedicate their lives to building pyramids. Only the names, shapes and sizes of these pyramids change from one culture to the other. They may take the form, for example, of a suburban cottage with a swimming pool and an evergreen lawn, or a gleaming penthouse with an enviable view. Few question the myths that cause us to desire the pyramid in the first place.

c. The imagined order is inter-subjective. Even if by some superhuman effort I succeed in freeing my personal desires from the grip of the imagined order, I am just one person. In order to change the imagined order I must convince millions of strangers to cooperate with me. For the imagined order is not a subjective order existing in my own imagination - it is rather an inter-subjective order, existing in the shared imagination of thousands and millions of people.

In order to understand this, we need to understand the difference between 'objective', 'subjective', and 'inter-subjective'.

An objective phenomenon exists independently of human consciousness and human beliefs. Radioactivity, for example, is not a myth. Radioactive emissions occurred long before people discovered them, and they are dangerous even when people do not believe in them. Marie Curie, one of the discoverers of radioactivity, did not know, during her long years of studying radioactive materials, that they could harm her body. While she did not believe that radioactivity could kill her, she nevertheless died of aplastic anaemia, a disease caused by overexposure to radioactive materials.

The subjective is something that exists depending on the consciousness and beliefs of a single individual. It disappears or changes if that particular individual changes his or her beliefs. Many a child believes in the existence of an imaginary friend who is invisible and inaudible to the rest of the world. The imaginary friend exists solely in the child's subjective

restaurants, to sleep in white hotels. The justification for all of this was that blacks were foul, slothful and vicious, so whites had to be protected from them. Whites did not want to sleep in the same hotel as blacks or to eat in the same restaurant, for fear of diseases. They did not want their children learning in the same school as black children, for fear of brutality and bad influences. They did not want blacks voting in elections, since blacks were ignorant and immoral. These fears were substantiated by scientific studies that 'proved' that blacks were indeed less educated, that various diseases were more common among them, and that their crime rate was far higher (the studies ignored the fact that these 'facts' resulted from discrimination against blacks).

By the mid-twentieth century, segregation in the former Confederate states was probably worse than in the late nineteenth century. Clennon King, a black student who applied to the University of Mississippi in 1958, was forcefully committed to a mental asylum. The presiding judge ruled that a black person must surely be insane to think that he could be admitted to the University of Mississippi.

The vicious circle: a chance historical situation is translated into a rigid social system.

Nothing was as revolting to American southerners (and many northerners) as sexual relations and marriage between black men and white women. Sex between the races became the greatest taboo and any violation, or suspected violation, was viewed as deserving immediate and summary punishment in the form of lynching. The Ku Klux Klan, a white supremacist secret society, perpetrated many such killings. They could have taught the Hindu Brahmins a thing or two about purity laws.

With time, the racism spread to more and more cultural arenas. American aesthetic culture was built around white standards of beauty. The physical attributes of the white race - for example light skin, fair and straight hair, a small upturned nose - came to be identified as beautiful. Typical black features - dark skin, dark and bushy hair, a flattened nose - were deemed ugly. These preconceptions ingrained the imagined hierarchy at an even deeper level of human consciousness.

community, no lion alpha male makes a bid for becoming the king of all lions, and at the entrance of no beehive can one find the slogan: 'Worker bees of the world - unite!'

But beginning with the Cognitive Revolution, Homo sapiens became more and more exceptional in this respect. People began to cooperate on a regular basis with complete strangers, whom they imagined as 'brothers' or 'friends'. Yet this brotherhood was not universal. Somewhere in the next valley, or beyond the mountain range, one could still sense 'them'. When the first pharaoh, Menes, united Egypt around 3000 BC, it was clear to the Egyptians that Egypt had a border, and beyond the border lurked 'barbarians'. The barbarians were alien, threatening, and interesting only to the extent that they had land or natural resources that the Egyptians wanted. All the imagined orders people created tended to ignore a substantial part of humankind.

The first millennium BC witnessed the appearance of three potentially universal orders, whose devotees could for the first time imagine the entire world and the entire human race as a single unit governed by a single set of laws. Everyone was 'us', at least potentially. There was no longer 'them'. The first universal order to appear was economic: the monetary order. The second universal order was political: the imperial order. The third universal order was religious: the order of universal religions such as Buddhism, Christianity and Islam.

Merchants, conquerors and prophets were the first people who managed to transcend the binary evolutionary division, 'us vs them', and to foresee the potential unity of humankind. For the merchants, the entire world was a single market and all humans were potential customers. They tried to establish an economic order that would apply to all, everywhere. For the conquerors, the entire world was a single empire and all humans were potential subjects, and for the prophets, the entire world held a single truth and all humans were potential believers. They too tried to establish an order that would be applicable for everyone everywhere.

During the last three millennia, people made more and more ambitious attempts to realise that global vision. The next three chapters discuss how money, empires and universal religions spread, and how they laid the

This new imperial vision passed from Cyrus and the Persians to Alexander the Great, and from him to Hellenistic kings, Roman emperors, Muslim caliphs, Indian dynasts, and eventually even to Soviet premiers and American presidents. This benevolent imperial vision has justified the existence of empires, and negated not only attempts by subject peoples to rebel, but also attempts by independent peoples to resist imperial expansion.

Similar imperial visions were developed independently of the Persian model in other parts of the world, most notably in Central America, in the Andean region, and in China. According to traditional Chinese political theory, Heaven (Tian) is the source of all legitimate authority on earth. Heaven chooses the most worthy person or family and gives them the Mandate of Heaven. This person or family then rules over All Under Heaven (Tianxia) for the benefit of all its inhabitants. Thus, a legitimate authority is - by definition - universal. If a ruler lacks the Mandate of Heaven, then he lacks legitimacy to rule even a single city. If a ruler enjoys the mandate, he is obliged to spread justice and harmony to the entire world. The Mandate of Heaven could not be given to several candidates simultaneously, and consequently one could not legitimise the existence of more than one independent state.

The first emperor of the united Chinese empire, Qin Shi Huangdi, boasted that 'throughout the six directions [of the universe] everything belongs to the emperor ... wherever there is a human footprint, there is not one who did not become a subject [of the emperor] ... his kindness reaches even oxen and horses. There is not one who did not benefit. Every man is safe under his own roof.'⁴ In Chinese political thinking as well as Chinese historical memory, imperial periods were henceforth seen as golden ages of order and justice. In contradiction to the modern Western view that a just world is composed of separate nation states, in China periods of political fragmentation were seen as dark ages of chaos and injustice. This perception has had far-reaching implications for Chinese history. Every time an empire collapsed, the dominant political theory goaded the powers that be not to settle for paltry independent principalities, but to attempt reunification. Sooner or later these attempts always succeeded.

rituals and practices taken from different sources. It's called syncretism. Syncretism might, in fact, be the single great world religion.

The Law of Nature

All the religions we have discussed so far share one important characteristic: they all focus on a belief in gods and other supernatural entities. This seems obvious to Westerners, who are familiar mainly with monotheistic and polytheist creeds. In fact, however, the religious history of the world does not boil down to the history of gods. During the first millennium BC, religions of an altogether new kind began to spread through Afro-Asia. The newcomers, such as Jainism and Buddhism in India, Daoism and Confucianism in China, and Stoicism, Cynicism and Epicureanism in the Mediterranean basin, were characterised by their disregard of gods.

These creeds maintained that the superhuman order governing the world is the product of natural laws rather than of divine wills and whims. Some of these natural-law religions continued to espouse the existence of gods, but their gods were subject to the laws of nature no less than humans, animals and plants were. Gods had their niche in the ecosystem, just as elephants and porcupines had theirs, but could no more change the laws of nature than elephants can. A prime example is Buddhism, the most important of the ancient natural law religions, which remains one of the major faiths.

The central figure of Buddhism is not a god but a human being, Siddhartha Gautama. According to Buddhist tradition, Gautama was heir to a small Himalayan kingdom, sometime around 500 BC. The young prince was deeply affected by the suffering evident all around him. He saw that men and women, children and old people, all suffer not just from occasional calamities such as war and plague, but also from anxiety, frustration and discontent, all of which seem to be an inseparable part of the human condition. People pursue wealth and power, acquire knowledge and possessions, beget sons and daughters, and build houses and palaces. Yet no matter what they achieve, they are never content. Those who live in poverty dream of riches. Those who have a million want two million. Those who

were willing to put into science. We would never have been able to walk on the moon, engineer microorganisms and split the atom without such investments. The US government, for example, has in recent decades allocated billions of dollars to the study of nuclear physics. The knowledge produced by this research has made possible the construction of nuclear power stations, which provide cheap electricity for American industries, which pay taxes to the US government, which uses some of these taxes to finance further research in nuclear physics.

The Scientific Revolution's feedback loop. Science needs more than just research to make progress. It depends on the mutual reinforcement of science, politics and economics. Political and economic institutions provide the resources without which scientific research is almost impossible. In return, scientific research provides new powers that are used, among other things, to obtain new resources, some of which are reinvested in research.

Why did modern humans develop a growing belief in their ability to obtain new powers through research? What forged the bond between science, politics and economics? This chapter looks at the unique nature of modern science in order to provide part of the answer. The next two chapters examine the formation of the alliance between science, the European empires and the economics of capitalism.

Ignoramus

Humans have sought to understand the universe at least since the Cognitive Revolution. Our ancestors put a great deal of time and effort into trying to discover the rules that govern the natural world. But modern science differs from all previous traditions of knowledge in three critical ways:

- a. The willingness to admit ignorance. Modern science is based on the Latin injunction *ignoramus* - 'we do not know'. It assumes that we don't know everything. Even more critically, it accepts that the things that we think we know could be proven wrong as we gain more knowledge. No concept, idea or theory is sacred and beyond challenge.

Perhaps in a strict Hindu society, where cows are sacred, or in a society committed to animal rights, Professor Sprout would have a better shot. But as long as she lives in a society that values the commercial potential of milk and the health of its human citizens over the feelings of cows, she'd best write up her research proposal so as to appeal to those assumptions. For example, she might write that 'Depression leads to a decrease in milk production. If we understand the mental world of dairy cows, we could develop psychiatric medication that will improve their mood, thus raising milk production by up to 10 per cent. I estimate that there is a global annual market of \$250 million for bovine psychiatric medications.'

Science is unable to set its own priorities. It is also incapable of determining what to do with its discoveries. For example, from a purely scientific viewpoint it is unclear what we should do with our increasing understanding of genetics. Should we use this knowledge to cure cancer, to create a race of genetically engineered supermen, or to engineer dairy cows with super-sized udders? It is obvious that a liberal government, a Communist government, a Nazi government and a capitalist business corporation would use the very same scientific discovery for completely different purposes, and there is no scientific reason to prefer one usage over others.

In short, scientific research can flourish only in alliance with some religion or ideology. The ideology justifies the costs of the research. In exchange, the ideology influences the scientific agenda and determines what to do with the discoveries. Hence in order to comprehend how humankind has reached Alamogordo and the moon - rather than any number of alternative destinations - it is not enough to survey the achievements of physicists, biologists and sociologists. We have to take into account the ideological, political and economic forces that shaped physics, biology and sociology, pushing them in certain directions while neglecting others.

Two forces in particular deserve our attention: imperialism and capitalism. The feedback loop between science, empire and capital has arguably been history's chief engine for the past 500 years. The following chapters analyse its workings. First we'll look at how the twin turbines of science and empire

Rawlinson did not rest on his laurels. As an army officer, he had military and political missions to carry out, but whenever he had a spare moment he puzzled over the secret script. He tried one method after another and finally managed to decipher the Old Persian part of the inscription. This was easiest, since Old Persian was not that different from modern Persian, which Rawlinson knew well. An understanding of the Old Persian section gave him the key he needed to unlock the secrets of the Elamite and Babylonian sections. The great door swung open, and out came a rush of ancient but lively voices - the bustle of Sumerian bazaars, the proclamations of Assyrian kings, the arguments of Babylonian bureaucrats. Without the efforts of modern European imperialists such as Rawlinson, we would not have known much about the fate of the ancient Middle Eastern empires.

Another notable imperialist scholar was William Jones. Jones arrived in India in September 1783 to serve as a judge in the Supreme Court of Bengal. He was so captivated by the wonders of India that within less than six months of his arrival he had founded the Asiatic Society. This academic organisation was devoted to studying the cultures, histories and societies of Asia, and in particular those of India. Within two years Jones published his observations on the Sanskrit language, which pioneered the science of comparative linguistics.

In his publications Jones pointed out surprising similarities between Sanskrit, an ancient Indian language that became the sacred tongue of Hindu ritual, and the Greek and Latin languages, as well as similarities between all these languages and Gothic, Celtic, Old Persian, German, French and English. Thus in Sanskrit, 'mother' is 'matar', in Latin it is 'mater', and in Old Celtic it is 'mathir'. Jones surmised that all these languages must share a common origin, developing from a now-forgotten ancient ancestor. He was thus the first to identify what later came to be called the Indo-European family of languages.

Jones' study was an important milestone not merely due to his bold (and accurate) hypotheses, but also because of the orderly methodology that he developed to compare languages. It was adopted by other scholars, enabling them systematically to study the development of all the world's languages.

now, the central bank and the royal treasury owned a huge amount of worthless stock and had no money. The big speculators emerged largely unscathed - they had sold in time. Small investors lost everything, and many committed suicide.

The Mississippi Bubble was one of history's most spectacular financial crashes. The royal French financial system never recuperated fully from the blow. The way in which the Mississippi Company used its political clout to manipulate share prices and fuel the buying frenzy caused the public to lose faith in the French banking system and in the financial wisdom of the French king. Louis XV found it more and more difficult to raise credit. This became one of the chief reasons that the overseas French Empire fell into British hands. While the British could borrow money easily and at low interest rates, France had difficulties securing loans, and had to pay high interest on them. In order to finance his growing debts, the king of France borrowed more and more money at higher and higher interest rates. Eventually, in the 1780s, Louis XVI, who had ascended to the throne on his grandfather's death, realised that half his annual budget was tied to servicing the interest on his loans, and that he was heading towards bankruptcy. Reluctantly, in 1789, Louis XVI convened the Estates General, the French parliament that had not met for a century and a half, in order to find a solution to the crisis. Thus began the French Revolution.

While the French overseas empire was crumbling, the British Empire was expanding rapidly. Like the Dutch Empire before it, the British Empire was established and run largely by private joint-stock companies based in the London stock exchange. The first English settlements in North America were established in the early seventeenth century by joint-stock companies such as the London Company, the Plymouth Company, the Dorchester Company and the Massachusetts Company.

The Indian subcontinent too was conquered not by the British state, but by the mercenary army of the British East India Company. This company outperformed even the VOC. From its headquarters in Leadenhall Street, London, it ruled a mighty Indian empire for about a century, maintaining a huge military force of up to 350,000 soldiers, considerably outnumbering the armed forces of the British monarchy. Only in 1858 did the British

than the amount needed to feed all the hungry people in the rest of the world. Obesity is a double victory for consumerism. Instead of eating little, which will lead to economic contraction, people eat too much and then buy diet products - contributing to economic growth twice over.

How can we square the consumerist ethic with the capitalist ethic of the business person, according to which profits should not be wasted, and should instead be reinvested in production? It's simple. As in previous eras, there is today a division of labour between the elite and the masses. In medieval Europe, aristocrats spent their money carelessly on extravagant luxuries, whereas peasants lived frugally, minding every penny. Today, the tables have turned. The rich take great care managing their assets and investments, while the less well heeled go into debt buying cars and televisions they don't really need.

The capitalist and consumerist ethics are two sides of the same coin, a merger of two commandments. The supreme commandment of the rich is 'Invest!' The supreme commandment of the rest of us is 'Buy!'

The capitalist-consumerist ethic is revolutionary in another respect. Most previous ethical systems presented people with a pretty tough deal. They were promised paradise, but only if they cultivated compassion and tolerance, overcame craving and anger, and restrained their selfish interests. This was too tough for most. The history of ethics is a sad tale of wonderful ideals that nobody can live up to. Most Christians did not imitate Christ, most Buddhists failed to follow Buddha, and most Confucians would have caused Confucius a temper tantrum.

In contrast, most people today successfully live up to the capitalist-consumerist ideal. The new ethic promises paradise on condition that the rich remain greedy and spend their time making more money, and that the masses give free rein to their cravings and passions - and buy more and more. This is the first religion in history whose followers actually do what they are asked to do. How, though, do we know that we'll really get paradise in return? We've seen it on television.

an inevitable one, which we had better turn to our own advantage. Ours is the first time in history that the world is dominated by a peace-loving elite - politicians, business people, intellectuals and artists who genuinely see war as both evil and avoidable. (There were pacifists in the past, such as the early Christians, but in the rare cases that they gained power, they tended to forget about their requirement to 'turn the other cheek'.)

There is a positive feedback loop between all these four factors. The threat of nuclear holocaust fosters pacifism; when pacifism spreads, war recedes and trade flourishes; and trade increases both the profits of peace and the costs of war. Over time, this feedback loop creates another obstacle to war, which may ultimately prove the most important of all. The tightening web of international connections erodes the independence of most countries, lessening the chance that any one of them might single-handedly let slip the dogs of war. Most countries no longer engage in full-scale war for the simple reason that they are no longer independent. Though citizens in Israel, Italy, Mexico or Thailand may harbour illusions of independence, the fact is that their governments cannot conduct independent economic or foreign policies, and they are certainly incapable of initiating and conducting full-scale war on their own. As explained in Chapter 11, we are witnessing the formation of a global empire. Like previous empires, this one, too, enforces peace within its borders. And since its borders cover the entire globe, the World Empire effectively enforces world peace.

So, is the modern era one of mindless slaughter, war and oppression, typified by the trenches of World War One, the nuclear mushroom cloud over Hiroshima and the gory manias of Hitler and Stalin? Or is it an era of peace, epitomised by the trenches never dug in South America, the mushroom clouds that never appeared over Moscow and New York, and the serene visages of Mahatma Gandhi and Martin Luther King?

The answer is a matter of timing. It is sobering to realise how often our view of the past is distorted by events of the last few years. If this chapter had been written in 1945 or 1962, it would probably have been much more glum. Since it was written in 2014, it takes a relatively buoyant approach to modern history.

The first crack in the old regime appeared about 10,000 years ago, during the Agricultural Revolution. Sapiens who dreamed of fat, slow-moving chickens discovered that if they mated the fattest hen with the slowest cock, some of their offspring would be both fat and slow. If you mated those offspring with each other, you could produce a line of fat, slow birds. It was a race of chickens unknown to nature, produced by the intelligent design not of a god but of a human.

Still, compared to an all-powerful deity, Homo sapiens had limited design skills. Sapiens could use selective breeding to detour around and accelerate the natural-selection processes that normally affected chickens, but they could not introduce completely new characteristics that were absent from the genetic pool of wild chickens. In a way, the relationship between Homo sapiens and chickens was similar to many other symbiotic relationships that have so often arisen on their own in nature. Sapiens exerted peculiar selective pressures on chickens that caused the fat and slow ones to proliferate, just as pollinating bees select flowers, causing the bright colourful ones to proliferate.

Today, the 4-billion-year-old regime of natural selection is facing a completely different challenge. In laboratories throughout the world, scientists are engineering living beings. They break the laws of natural selection with impunity, unbridled even by an organisms original characteristics. Eduardo Kac, a Brazilian bio-artist, decided in 2000 to create a new work of art: a fluorescent green rabbit. Kac contacted a French laboratory and offered it a fee to engineer a radiant bunny according to his specifications. The French scientists took a run-of-the-mill white rabbit embryo, implanted in its DNA a gene taken from a green fluorescent jellyfish, and voila! One green fluorescent rabbit for le monsieur. Kac named the rabbit Alba.

It is impossible to explain the existence of Alba through the laws of natural selection. She is the product of intelligent design. She is also a harbinger of things to come. If the potential Alba signifies is realised in full - and if humankind doesn't annihilate itself meanwhile - the Scientific Revolution might prove itself far greater than a mere historical revolution. It may turn out to be the most important biological revolution since the appearance of

5 History's Biggest Fraud

1 The map is based mainly on: Peter Bellwood, *First Farmers: The Origins of Agricultural Societies* (Malden: Blackwell Publishing, 2005).

2 Jared Diamond, *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W. W. Norton, 1997).

3 Gat, *War in Human Civilization*, 130-1; Robert S. Walker and Drew H. Bailey, 'Body Counts in Lowland South American Violence', *Evolution and Human Behavior* 34 (2013), 29-34.

4 Katherine A. Spielmann, 'A Review: Dietary Restriction on Hunter-Gatherer Women and the Implications for Fertility and Infant Mortality', *Human Ecology* 17:3 (1989), 321-45. See also: Bruce Winterhalder and Eric Alder Smith, 'Analyzing Adaptive Strategies: Human Behavioral Ecology at Twenty-Five', *Evolutionary Anthropology* 9:2 (2000), 51-72.

5 Alain Bideau, Bertrand Desjardins and Hector Perez-Brignoli (eds.), *Infant and Child Mortality in the Past* (Oxford: Clarendon Press, 1997); Edward Anthony Wrigley et al., *English Population History from Family Reconstitution, 1580-1837* (Cambridge: Cambridge University Press, 1997), 295-6, 303.

6 Manfred Heun et al., 'Site of Einkorn Wheat Domestication Identified by DNA Fingerprints', *Science* 278:5341 (1997), 1,312-14.

7 Charles Patterson, *Eternal Treblinka: Our Treatment of Animals and the Holocaust* (New York: Lantern Books, 2002), 9-10; Peter J. Ucko and G. W. Dimbleby (eds.), *The Domestication and Exploitation of Plants and Animals* (London: Duckworth, 1969), 259.

8 Avi Pinkas (ed.), *Farmyard Animals in Israel - Research, Humanism and Activity* (Rishon Le-Ziyyon: The Association for Farmyard Animals, 2009 [Hebrew]), 169-99; 'Milk Production - the Cow' [Hebrew], The Dairy Council, accessed 22 March 2012, <http://www.milk.org.il/cgi->