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# NEXUS

***A Brief History of Information Networks from the Stone Age to AI***

VINTAGE

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# Part I

## HUMAN NETWORKS

CHAPTER 1

# What Is Information?

It is always tricky to define fundamental concepts. Since they are the basis for everything that follows, they themselves seem to lack any basis of their own. Physicists have a hard time defining matter and energy, biologists have a hard time defining life, and philosophers have a hard time defining reality.

Information is increasingly seen by many philosophers and biologists, and even by some physicists, as the most basic building block of reality, more elementary than matter and energy.[1] No wonder that there are many disputes about how to define information, and how it is related to the evolution of life or to basic ideas in physics such as entropy, the laws of thermodynamics and the quantum uncertainty principle.[2] This book will make no attempt to resolve – or even explain – these disputes, nor will it offer a universal definition of information applicable to physics, biology and all other fields of knowledge. Since it is a work of history, which studies the past and future development of human societies, it will focus on the definition and role of information in history.

In everyday usage, 'information' is associated with human-made symbols like spoken or written words.

Consider, for example, the story of Cher Ami and the Lost Battalion. In October 1918, when the American Expeditionary Forces were fighting to liberate northern France from the Germans, a battalion of more than five hundred American soldiers was trapped behind enemy lines. American artillery, which was trying to provide them with cover fire, misidentified their location and dropped the barrage directly on them. The battalion's commander, Major Charles Whittlesey, urgently needed to inform headquarters of his true location, but no runner could break through the German line. According to several accounts, as a last resort Whittlesey turned to Cher Ami, an army carrier pigeon. On a tiny piece of paper, Whittlesey wrote, 'We are along the road paralell [*sic*] 276.4. Our artillery is dropping a barrage directly on us. For heaven's sake stop it.' The paper was inserted into a canister on Cher Ami's right leg, and the bird was released into the air. One of the battalion's soldiers, Private John Nell, recalled years later, 'We knew without a doubt this was our last chance. If that one lonely, scared pigeon failed to find its loft, our fate was sealed.'

Witnesses later described how Cher Ami flew into heavy German fire. A shell exploded directly below the bird, killing five men and severely injuring the pigeon. A splinter tore through Cher Ami's chest, and his right leg was left hanging by a tendon. But he got through. The wounded pigeon flew the forty kilometres to division headquarters in about forty-five minutes, with the canister containing the crucial message attached to the remnant of his right leg. Though there is some controversy about the exact details, it is clear that the American artillery adjusted its barrage, and an American counterattack rescued the Lost Battalion. Cher Ami was tended by army medics, sent to the United

States as a hero, and became the subject of numerous articles, short stories, children's books, poems and even movies. The pigeon had no idea what information he was conveying, but the symbols inked on the piece of paper he carried helped save hundreds of men from death and captivity.[3]

Information, however, does not have to consist of human-made symbols. According to the biblical myth of the Flood, Noah learned that the water had finally receded because the pigeon he sent out from the ark returned with an olive branch in her mouth. Then God set a rainbow in the clouds as a heavenly record of his promise never to flood the earth again. Pigeons, olive branches and rainbows have since become iconic symbols of peace and tolerance. Objects that are even more remote than rainbows can also be information. For astronomers the shape and movement of galaxies constitute crucial information about the history of the universe. For navigators the North Star indicates which way is north. For astrologers the stars are a cosmic script, conveying information about the future of individual humans and entire societies.

Of course, defining something as 'information' is a matter of perspective. An astronomer or astrologer might view the Libra constellation as 'information', but these distant stars are far more than just a notice board for human observers. There might be an alien civilisation up there, totally oblivious to the information we glean from their home and to the stories we tell about it. Similarly, a piece of paper marked with ink splotches can be crucial information for an army unit, or dinner for a family of termites. Any object can be information – or not. This makes it difficult to define what information is.

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The ambivalence of information has played an important role in the annals of military espionage, when spies needed to communicate information surreptitiously. During the First World War, northern France was not the only major battleground. From 1915 to 1918 the British and Ottoman Empires fought for control of the Middle East. After repulsing an Ottoman attack on the Sinai Peninsula and the Suez Canal, the British in turn invaded the Ottoman Empire, but were held at bay until October 1917 by a fortified Ottoman line stretching from Beersheba to Gaza. British attempts to break through were repulsed at the First Battle of Gaza (26 March 1917) and the Second Battle of Gaza (17–19 April 1917). Meanwhile, pro-British Jews living in Palestine set up a spy network code-named NILI to inform the British about Ottoman troop movements. One method they developed to communicate with their British operators involved window shutters. Sarah Aaronsohn, a NILI commander, had a house overlooking the Mediterranean. She signalled British ships by closing or opening a particular shutter, according to a predetermined code. Numerous people, including Ottoman soldiers, could obviously see the shutter, but nobody other than NILI agents and their British operators understood it was vital military information.[4] So, when is a shutter just a shutter, and when is it information?

The Ottomans eventually caught the NILI spy ring due in part to a strange mishap. In addition to shutters, NILI used carrier pigeons to convey coded messages. On 3 September 1917, one of the pigeons diverged off course and landed in – of all places – the house of an Ottoman officer. The officer found the coded message but couldn't decipher it. Nevertheless, the pigeon itself was crucial

information. Its existence indicated to the Ottomans that a spy ring was operating under their noses. As Marshall McLuhan might have put it, the pigeon was the message. NILI agents learned about the capture of the pigeon and immediately killed and buried all the remaining birds they had, because the mere possession of carrier pigeons was now incriminating information. But the massacre of the pigeons did not save NILI. Within a month the spy network was uncovered, several of its members were executed, and Sarah Aaronsohn committed suicide to avoid divulging NILI's secrets under torture.[5] When is a pigeon just a pigeon, and when is it information?

Clearly, then, information cannot be defined as specific types of material objects. Any object – a star, a shutter, a pigeon – can be information in the right context. So exactly what context defines such objects as 'information'? The naive view of information argues that objects are defined as information in the context of truth seeking. Something is information if people use it to try to discover the truth. This view links the concept of information with the concept of truth and assumes that the main role of information is to represent reality. There is a reality 'out there', and information is something that represents that reality and that we can therefore use to learn about reality. For example, the information NILI provided the British was meant to represent the reality of Ottoman troop movements. If the Ottomans massed ten thousand soldiers in Gaza – the centrepiece of their defences – a piece of paper with symbols representing 'ten thousand' and 'Gaza' was important information that could help the British win the battle. If, on the other hand, there were actually twenty thousand Ottoman troops in Gaza, that piece of

paper did not represent reality accurately, and could lead the British to make a disastrous military mistake.

Put another way, the naive view argues that information is an attempt to represent reality, and when this attempt succeeds, we call it truth. While this book takes many issues with the naive view, it agrees that truth is an accurate representation of reality. But this book also holds that most information is *not* an attempt to represent reality and that what defines information is something entirely different. Most information in human society, and indeed in other biological and physical systems, *does not represent anything*.

I want to spend a little longer on this complex and crucial argument, because it constitutes the theoretical basis of the book.

## WHAT IS TRUTH?

Throughout this book, 'truth' is understood as something that accurately represents certain aspects of reality. Underlying the notion of truth is the premise that there exists one universal reality. Anything that has ever existed or will ever exist in the universe – from the North Star, to the NILI pigeon, to web pages on astrology – is part of this single reality. This is why the search for truth is a universal project. While different people, nations or cultures may have competing beliefs and feelings, they cannot possess contradictory truths, because they all share a universal reality. Anyone who rejects universalism rejects truth.

Truth and reality are nevertheless different things, because no matter how truthful an account is, it can never represent reality in all its aspects. If a NILI agent wrote that there are ten thousand Ottoman soldiers in Gaza, and there were indeed ten thousand soldiers there,

this accurately pointed to a certain aspect of reality, but it neglected many other aspects. The very act of counting entities – whether apples, oranges, or soldiers – necessarily focuses attention on the similarities between these entities while discounting differences.[6] For example, saying only that there were ten thousand Ottoman soldiers in Gaza neglected to specify whether some were experienced veterans and others were green recruits. If there were a thousand recruits and nine thousand old hands, the military reality was quite different from if there were nine thousand rookies and a thousand battle-hardened veterans.

There were many other differences between the soldiers. Some were healthy; others were sick. Some Ottoman troops were ethnically Turkish, while others were Arabs, Kurds, or Jews. Some were brave, others cowardly. Indeed, each soldier was a unique human being, with different parents and friends and individual fears and hopes. First World War poets like Wilfred Owen famously attempted to represent these latter aspects of military reality, which mere statistics never conveyed accurately. Does this imply that writing 'ten thousand soldiers' is always a misrepresentation of reality, and that to describe the military situation around Gaza in 1917, we must specify the unique history and personality of every soldier?

Another problem with any attempt to represent reality is that reality contains many viewpoints. For example, present-day Israelis, Palestinians, Turks and Britons have different perspectives on the British invasion of the Ottoman Empire, the NILI underground and the activities of Sarah Aaronsohn. That does not mean, of course, that there are several entirely separate realities,

or that there are no historical facts. There is just one reality, but it is complex.

Reality includes an objective level with objective facts that don't depend on people's beliefs; for example, it is an objective fact that Sarah Aaronsohn died on 9 October 1917, from self-inflicted gunshot wounds. Saying that 'Sarah Aaronsohn died in an airplane crash on 15 May 1919' is an error.

Reality also includes a subjective level with subjective facts like the beliefs and feelings of various people, but in this case, too, facts can be separated from errors. For example, it is a fact that Israelis tend to regard Aaronsohn as a patriotic hero. Three weeks after her suicide, the information NILI supplied helped the British finally break the Ottoman line at the Battle of Beersheba (31 October 1917) and the Third Battle of Gaza (1–2 November 1917). On 2 November 1917, the British foreign secretary, Arthur Balfour, issued the Balfour Declaration, announcing that the British government 'view with favour the establishment in Palestine of a national home for the Jewish people'. Israelis credit this in part to NILI and Sarah Aaronsohn, whom they admire for her sacrifice. It is another fact that Palestinians evaluate things very differently. Rather than admiring Aaronsohn, they regard her – if they've heard about her at all – as an imperialist agent. Even though we are dealing here with subjective views and feelings, we can still distinguish truth from falsehood. For views and feelings – just like stars and pigeons – are a part of the universal reality. Saying that 'Sarah Aaronsohn is admired by everyone for her role in defeating the Ottoman Empire' is an error, not in line with reality.

Nationality is not the only thing that affects people's viewpoint. Israeli men and Israeli women may see

Aaronsohn differently, and so do left-wingers and right-wingers, or Orthodox and secular Jews. Since suicide is forbidden by Jewish religious law, Orthodox Jews have difficulty seeing Aaronsohn's suicide as a heroic act (she was actually denied burial in the hallowed ground of a Jewish cemetery). Ultimately, each individual has a different perspective on the world, shaped by the intersection of different personalities and life histories. Does this imply that when we wish to describe reality, we must always list all the different viewpoints it contains and that a truthful biography of Sarah Aaronsohn, for example, must specify how every single Israeli and Palestinian has felt about her?

Taken to extremes, such a pursuit of accuracy may lead us to try to represent the world on a one-to-one scale, as in the famous Jorge Luis Borges story 'On Exactitude in Science' (1946). In this story Borges tells of a fictitious ancient empire that became obsessed with producing ever more accurate maps of its territory, until eventually it produced a map with a one-to-one scale. The entire empire was covered with a map of the empire. So many resources were wasted on this ambitious representational project that the empire collapsed. Then the map too began to disintegrate, and Borges tells us that only 'in the western Deserts, tattered fragments of the map are still to be found, sheltering an occasional beast or beggar'.[7] A one-to-one map may look like the ultimate representation of reality, but tellingly it is no longer a representation at all; it is the reality.

The point is that even the most truthful accounts of reality can never represent it in full. There are always some aspects of reality that are neglected or distorted in every representation. Truth, then, isn't a one-to-one representation of reality. Rather, truth is something

that brings our attention to certain aspects of reality while inevitably ignoring other aspects. No account of reality is 100 per cent accurate, but some accounts are nevertheless more truthful than others.

## WHAT INFORMATION DOES

As noted above, the naive view sees information as an attempt to represent reality. It is aware that some information doesn't represent reality well, but it dismisses this as unfortunate cases of 'misinformation' or 'disinformation'. Misinformation is an honest mistake, occurring when someone tries to represent reality but gets it wrong. Disinformation is a deliberate lie, occurring when someone consciously intends to distort our view of reality.

The naive view further believes that the solution to the problems caused by misinformation and disinformation is more information. This idea, sometimes called the counterspeech doctrine, is associated with the US Supreme Court justice Louis D. Brandeis, who wrote in *Whitney v. California* (1927) that the remedy to false speech is more speech and that in the long term free discussion is bound to expose falsehoods and fallacies. If all information is an attempt to represent reality, then as the amount of information in the world grows, we can expect the flood of information to expose the occasional lies and errors and to ultimately provide us with a more truthful understanding of the world.

On this crucial point, this book strongly disagrees with the naive view. There certainly are instances of information that attempt to represent reality and succeed in doing so, but this is *not* the defining characteristic of information. A few pages ago I

referred to stars as information and casually mentioned astrologers alongside astronomers. Adherents of the naive view of information probably squirmed in their chairs when they read it. According to the naive view, astronomers derive 'real information' from the stars, while the information that astrologers imagine to read in constellations is either 'misinformation' or 'disinformation'. If only people were given more information about the universe, surely they would abandon astrology altogether. But the fact is that for thousands of years astrology has had a huge impact on history, and today millions of people still check their star signs before making the most important decisions of their lives, like what to study and whom to marry. As of 2021, the global astrology market was valued at $12.8 billion.[8]

No matter what we think about the accuracy of astrological information, we should acknowledge its important role in history. It has connected lovers, and even entire empires. Roman emperors routinely consulted astrologers before making decisions. Indeed, astrology was held in such high esteem that casting the horoscope of a reigning emperor was a capital offence. Presumably, anyone casting such a horoscope could foretell when and how the emperor would die.[9] Rulers in some countries still take astrology very seriously. In 2005 the junta of Myanmar allegedly moved the country's capital from Yangon to Naypyidaw based on astrological advice.[10] A theory of information that cannot account for the historical significance of astrology is clearly inadequate.

What the example of astrology illustrates is that errors, lies, fantasies and fictions are information, too. Contrary to what the naive view of information says,

information has no essential link to truth, and its role in history isn't to represent a pre-existing reality. Rather, what information does is to create *new* realities by tying together disparate things – whether couples or empires. Its defining feature is connection rather than representation, and information is whatever connects different points into a network. Information doesn't necessarily inform us about things. Rather, it puts things in formation. Horoscopes put lovers in astrological formations, propaganda broadcasts put voters in political formations and marching songs put soldiers in military formations.

As a paradigmatic case, consider music. Most symphonies, melodies and tunes don't represent anything, which is why it makes no sense to ask whether they are true or false. Over the years people have created a lot of bad music, but not fake music. Without representing anything, music nevertheless does a remarkable job in connecting large numbers of people and synchronising their emotions and movements. Music can make soldiers march in formation, clubbers sway together, church congregations clap in rhythm and sports fans chant in unison.[11]

The role of information in connecting things is of course not unique to human history. A case can be made that this is the chief role of information in biology, too.[12] Consider DNA, the molecular information that makes organic life possible. Like music, DNA doesn't represent reality. Though generations of zebras have been fleeing lions, you cannot find in the zebra DNA a string of nucleobases representing 'lion' nor another string representing 'flight'. Similarly, zebra DNA contains no representation of the sun, wind, rain or any other external phenomena that zebras encounter during their

lives. Nor does DNA represent internal phenomena like body organs or emotions. There is no combination of nucleobases that represents a heart or fear.

Instead of trying to represent pre-existing things, DNA helps to produce entirely new things. For instance, various strings of DNA nucleobases initiate cellular chemical processes that result in the production of adrenaline. Adrenaline too doesn't represent reality in any way. Rather, adrenaline circulates through the body, initiating additional chemical processes that increase the heart rate and direct more blood to the muscles.[13] DNA and adrenaline thereby help to connect trillions of cells in the heart, legs and other body parts to form a functioning network that can do remarkable things, like run away from a lion.

If DNA represented reality, we could have asked questions like 'Does zebra DNA represent reality more accurately than lion DNA?' or 'Is the DNA of one zebra telling the truth, while another zebra is misled by her fake DNA?' These, of course, are nonsensical questions. We might evaluate DNA by the fitness of the organism it produces, but not by truthfulness. While it is common to talk about DNA 'errors', this refers only to mutations in the process of copying DNA – not to a failure to represent reality accurately. A mutation that inhibits the production of adrenaline reduces fitness, causing the network of cells to disintegrate, as when the zebra is killed and its trillions of cells lose connection with one another. But this kind of network failure means disintegration not disinformation. That's as true of countries, political parties and news networks as it is of zebras. Their existence too is jeopardised by loss of contact between their constituent parts, more than by inaccurate representations of reality.

Crucially, errors in the copying of DNA don't always reduce fitness. Once in a blue moon, they increase fitness. Without such mutations, there would be no process of evolution. All life-forms exist thanks to genetic 'errors'. The wonders of evolution are possible because DNA doesn't represent any pre-existing realities; it creates new realities.

Let us pause to digest the implications of this. Information is something that creates new realities by connecting different points into a network. This still includes the view of information as representation. Sometimes, a truthful representation of reality can connect humans, as when 600 million people sat glued to their television sets in July 1969, watching Neil Armstrong and Buzz Aldrin walking on the moon.[14] The images on the screens accurately represented what was happening 384,000 kilometres away, and seeing them gave rise to feelings of awe, pride and human brotherliness that helped connect people.

However, such fraternal feelings can be produced in other ways, too. The emphasis on connection leaves ample room for other types of information that do not represent reality well. Sometimes erroneous representations of reality might also serve as a social nexus, as when millions of followers of a conspiracy theory watch a YouTube video claiming that the moon landing never happened. These images convey an erroneous representation of reality, but they might nevertheless give rise to feelings of anger against the establishment or pride in one's own wisdom that help create a cohesive new group.

Sometimes networks can be connected without *any* attempt to represent reality, neither accurate nor erroneous, as when genetic information connects

trillions of cells or when a stirring musical piece connects thousands of humans.

As a final example, consider Mark Zuckerberg's vision of the Metaverse. The Metaverse is a virtual universe made entirely of information. Unlike the one-to-one map built by Jorge Luis Borges's imaginary empire, the Metaverse isn't an attempt to represent our world, but rather an attempt to augment or even replace our world. It doesn't offer us a digital replica of Buenos Aires or Salt Lake City; it invites people to build new virtual communities with novel landscapes and rules. As of 2024 the Metaverse seems like an overblown pipe dream, but within a couple of decades billions of people might migrate to live much of their lives in an augmented virtual reality, holding there most of their social and professional activities. People might come to build relationships, join movements, hold jobs and experience emotional ups and downs in environments made of bits rather than atoms. Perhaps only in some remote deserts, tattered fragments of the old reality could still be found, sheltering an occasional beast or beggar.

## INFORMATION IN HUMAN HISTORY

Viewing information as a social nexus helps us understand many aspects of human history that confound the naive view of information as representation. It explains the historical success not only of astrology but of much more important things, like the Bible. While some may dismiss astrology as a quaint sideshow in human history, nobody can deny the central role the Bible has played. If the main job of information had been to represent reality accurately, it

would have been hard to explain why the Bible became one of the most influential texts in history.

The Bible makes many serious errors in its description of both human affairs and natural processes. The book of Genesis claims that all human groups – including, for example, the San people of the Kalahari Desert and the Aborigines of Australia – descend from a single family that lived in the Middle East about four thousand years ago.[15] According to Genesis, after the Flood all Noah's descendants lived together in Mesopotamia, but following the destruction of the Tower of Babel they spread to the four corners of the Earth and became the ancestors of all living humans. In fact, the ancestors of the San people lived in Africa for hundreds of thousands of years without ever leaving the continent, and the ancestors of the Aborigines settled Australia more than fifty thousand years ago.[16] Both genetic and archaeological evidence rule out the idea that the entire ancient populations of South Africa and Australia were annihilated about four thousand years ago by a flood and that these areas were subsequently repopulated by Middle Eastern immigrants.

An even graver distortion involves our understanding of infectious diseases. The Bible routinely depicts epidemics as divine punishment for human sins[17] and claims they can be stopped or prevented by prayers and religious rituals.[18] However, epidemics are of course caused by pathogens and can be stopped or prevented by following hygiene rules and using medicines and vaccines. This is today widely accepted even by religious leaders like the pope, who during the COVID-19 pandemic advised people to self-isolate, instead of congregating to pray together.[19]

Yet while the Bible has done a poor job in representing the reality of human origins, migrations and epidemics, it has nevertheless been very effective in connecting billions of people and creating the Jewish and Christian religions. Like DNA initiating chemical processes that bind billions of cells into organic networks, the Bible initiated social processes that bonded billions of people into religious networks. And just as a network of cells can do things that single cells cannot, so a religious network can do things that individual humans cannot, like building temples, maintaining legal systems, celebrating holidays and waging holy wars.

To conclude, information sometimes represents reality, and sometimes doesn't. But it always connects. This is its fundamental characteristic. Therefore, when examining the role of information in history, although it sometimes makes sense to ask 'How well does it represent reality? Is it true or false?' often the more crucial questions are 'How well does it connect people? What new network does it create?'

It should be emphasised that rejecting the naive view of information as representation does not force us to reject the notion of truth, nor does it force us to embrace the populist view of information as a weapon. While information always connects, some types of information – from scientific books to political speeches – may strive to connect people by accurately representing certain aspects of reality. But this requires a special effort, which most information does not make. This is why the naive view is wrong to believe that creating more powerful information technology will necessarily result in a more truthful understanding of the world. If no additional steps are taken to tilt the balance in favour of truth, an increase in the amount and speed of information is likely

to swamp the relatively rare and expensive truthful accounts with much more common and cheap types of information.

When we look at the history of information from the Stone Age to the Silicon Age, we therefore see a constant rise in connectivity, without a concomitant rise in truthfulness or wisdom. Contrary to what the naive view believes, *Homo sapiens* didn't conquer the world because we are talented at turning information into an accurate map of reality. Rather, the secret of our success is that we are talented at using information to connect lots of individuals. Unfortunately, this ability often goes hand in hand with believing in lies, errors and fantasies. This is why even technologically advanced societies like Nazi Germany and the Soviet Union have been prone to hold delusional ideas, without their delusions necessarily weakening them. Indeed, the mass delusions of Nazi and Stalinist ideologies about things like race and class actually helped them make tens of millions of people march together in lockstep.

In chapters 2–5 we'll take a closer look at the history of information networks. We'll discuss how, over tens of thousands of years, humans invented various information technologies that greatly improved connectivity and cooperation without necessarily resulting in a more truthful representation of the world. These information technologies – invented centuries and millennia ago – still shape our world even in the era of the internet and AI. The first information technology we'll examine, which is also the first information technology developed by humans, is the story.

CHAPTER 2

# Stories: Unlimited Connections

We Sapiens rule the world not because we are so wise but because we are the only animals that can cooperate flexibly in large numbers. I have explored this idea in my previous books *Sapiens* and *Homo Deus*, but a brief recap is inescapable.

The Sapiens' ability to cooperate flexibly in large numbers has precursors among other animals. Some social mammals like chimpanzees display significant flexibility in the way they cooperate, while some social insects like ants cooperate in very large numbers. But neither chimps nor ants establish empires, religions or trade networks. Sapiens are capable of doing such things because we are far more flexible than chimps and can simultaneously cooperate in even larger numbers than ants. In fact, there is no upper limit to the number of Sapiens who can cooperate with one another. The Catholic Church has about 1.4 billion members. China has a population of about 1.4 billion. The global trade network connects about 8 billion Sapiens.

This is surprising given that humans cannot form long-term intimate bonds with more than a few hundred individuals.[1] It takes many years and common experiences to get to know someone's unique character

and history and to cultivate ties of mutual trust and affection. Consequently, if Sapiens networks were connected only by personal human-to-human bonds, our networks would have remained very small. This is the situation among our chimpanzee cousins, for example. Their typical community numbers 20–60 members, and on rare occasions the number might increase to 150–200.[2] This appears to have been the situation also among ancient human species like Neanderthals and archaic *Homo sapiens*. Each of their bands numbered a few dozen individuals, and different bands rarely cooperated.[3]

About seventy thousand years ago, *Homo sapiens* bands began displaying an unprecedented capacity to cooperate with one another, as evidenced by the emergence of inter-band trade and artistic traditions and by the rapid spread of our species from our African homeland to the entire globe. What enabled different bands to cooperate is that evolutionary changes in brain structure and linguistic abilities apparently gave Sapiens the aptitude to tell and believe fictional stories and to be deeply moved by them. Instead of building a network from human-to-human chains alone – as the Neanderthals, for example, did – stories provided *Homo sapiens* with a new type of chain: human-to-story chains. In order to cooperate, Sapiens no longer had to know each other personally; they just had to know the same story. And the same story can be familiar to billions of individuals. A story can thereby serve like a central connector, with an unlimited number of outlets into which an unlimited number of people can plug. For example, the 1.4 billion members of the Catholic Church are connected by the Bible and other key Christian stories; the 1.4 billion citizens of China are connected

by the stories of communist ideology and Chinese nationalism; and the 8 billion members of the global trade network are connected by stories about currencies, corporations and brands.

Even charismatic leaders who have millions of followers are an example of this rule rather than an exception. It may seem that in the case of ancient Chinese emperors, medieval Catholic popes or modern corporate titans it has been a single flesh-and-blood human – rather than a story – that has served as a nexus linking millions of followers. But, of course, in all these cases almost none of the followers has had a personal bond with the leader. Instead, what they have connected to has been a carefully crafted *story* about the leader, and it is in this story that they have put their faith.

Joseph Stalin, who stood at the nexus of one of the biggest personality cults in history, understood this well. When his troublesome son Vasily exploited his famous name to frighten and awe people, Stalin berated him. 'But I'm a Stalin too,' protested Vasily. 'No, you're not,' replied Stalin. 'You're not Stalin and I'm not Stalin. Stalin is Soviet power. Stalin is what he is in the newspapers and the portraits, not you, no – not even me!'[4]

Present-day influencers and celebrities would concur. Some have hundreds of millions of online followers, with whom they communicate daily through social media. But there is very little authentic personal connection there. The social media accounts are usually run by a team of experts, and every image and word is professionally crafted and curated to manufacture what is nowadays called a brand.[5]

A 'brand' is a specific type of story. To brand a product means to tell a story about that product, which may have little to do with the product's actual qualities but

which consumers nevertheless learn to associate with the product. For example, over the decades the Coca-Cola corporation has invested tens of billions of dollars in advertisements that tell and retell the story of the Coca-Cola drink.[6] People have seen and heard the story so often that many have come to associate a certain concoction of flavored water with fun, happiness and youth (as opposed to tooth decay, obesity and plastic waste). That's branding.[7]

As Stalin knew, it is possible to brand not only products but also individuals. A corrupt billionaire can be branded as the champion of the poor; a bungling imbecile can be branded as an infallible genius; and a guru who sexually abuses his followers can be branded as a chaste saint. People think they connect to the person, but in fact they connect to the story told *about* the person, and there is often a huge gulf between the two.

Even the story of Cher Ami, the heroic pigeon, was partly the product of a branding campaign aimed at enhancing the public image of the US Army's Pigeon Service. A 2021 revisionist study by the historian Frank Blazich found that though there is no doubt Cher Ami sustained severe injuries while transporting a message somewhere in Northern France, several key features of the story are doubtful or inaccurate. First, relying on contemporary military records, Blazich demonstrated that headquarters learned about the exact location of the Lost Battalion about twenty minutes *prior* to the pigeon's arrival. It was not the pigeon that put a stop to the barrage of friendly fire decimating the Lost Battalion. Even more crucially, there is simply no proof that the pigeon carrying Major Whittlesey's message was Cher Ami. It might well have been another bird, while Cher

Ami might have sustained his wounds a couple of weeks later, during an altogether different battle.

According to Blazich, the doubts and inconsistencies in Cher Ami's story were overshadowed by its propaganda value to the army and its appeal to the public. Over the years the story was retold so many times that facts became hopelessly enmeshed with fiction. Journalists, poets and filmmakers added fanciful details to it, for example that the pigeon lost an eye as well as a leg and that it was awarded the Distinguished Service Cross. In the 1920s and 1930s Cher Ami became the most famous bird in the world. When he died, his carefully preserved corpse was placed on display at the Smithsonian's National Museum of American History, where it became a pilgrimage site for American patriots and World War I veterans. As the story grew in the telling, it took over even the recollections of survivors of the Lost Battalion, who came to accept the popular narrative at face value. Blazich recounts the case of Sherman Eager, an officer in the Lost Battalion, who decades after the war brought his children to see Cher Ami at the Smithsonian and told them, 'You all owe your lives to that pigeon.' Whatever the facts may be, the story of the self-sacrificing winged saviour proved irresistible.[8]

As a much more extreme example, consider Jesus. Two millennia of storytelling have encased Jesus within such a thick cocoon of stories that it is impossible to recover the historical person. Indeed, for millions of devout Christians, merely raising the possibility that the real person was different from the story is blasphemy. As far as we can tell, the real Jesus was a typical Jewish preacher who built a small following by giving sermons and healing the sick. After his death, however, Jesus became the subject of one of the most remarkable branding

campaigns in history. This little-known provincial guru, who during his short career gathered just a handful of disciples and who was executed as a common criminal, was rebranded after death as the incarnation of the cosmic god who created the universe.[9] Though no contemporary portrait of Jesus has survived, and though the Bible never describes what he looked like, imaginary renderings of him have become some of the most recognisable icons in the world.

It should be stressed that the creation of the Jesus story was not a deliberate lie. People like Saint Paul, Tertullian, Saint Augustine and Martin Luther didn't set out to deceive anyone. They projected their deeply felt hopes and feelings on the figure of Jesus, in the same way that all of us routinely project our feelings on our parents, lovers and leaders. While branding campaigns are occasionally a cynical exercise of disinformation, most of the really big stories of history have been the result of emotional projections and wishful thinking. True believers play a key role in the rise of every major religion and ideology, and the Jesus story changed history because it gained an immense number of true believers.

By gaining all those believers, the story of Jesus managed to have a much bigger impact on history than the person of Jesus. The person of Jesus walked from village to village on his two feet, talking with people, eating and drinking with them, placing his hands on their sick bodies. He made a difference to the lives of perhaps several thousand individuals, all living in one minor Roman province. In contrast, the story of Jesus flew around the whole world, first on the wings of gossip, anecdote and rumour; then via parchment texts, paintings and statues; and eventually as blockbuster

movies and internet memes. Billions of people not only heard the Jesus story but came to believe in it too, which created one of the biggest and most influential networks in the world.

Stories like the one about Jesus can be seen as a way of stretching pre-existing biological bonds. Family is the strongest bond known to humans. One way that stories build trust between strangers is by making these strangers reimagine each other as family. The Jesus story presented Jesus as a parent figure for all humans, encouraged hundreds of millions of Christians to see each other as brothers and sisters and created a shared pool of family memories. While most Christians were not physically present at the Last Supper, they have heard the story so many times, and they have seen so many images of the event, that they 'remember' it more vividly than they remember most of the family dinners in which they actually participated.

Interestingly, Jesus's last supper was the Jewish Passover meal, which according to the Gospel accounts Jesus shared with his disciples just before his crucifixion. In Jewish tradition, the whole purpose of the Passover meal is to create and reenact artificial memories. Every year Jewish families sit together on the eve of Passover to eat and reminisce about 'their' exodus from Egypt. They are supposed not only to tell the story of how the descendants of Jacob escaped slavery in Egypt but to remember how they *personally* suffered at the hands of the Egyptians, how they *personally* saw the sea part, and how they *personally* received the Ten Commandments from Jehovah at Mount Sinai.

The Jewish tradition doesn't mince words here. The text of the Passover ritual (the Haggadah) insists that 'in every generation a person is obligated to regard

himself as if he personally had come out of Egypt'. If anyone objects that this is a fiction, and that they didn't personally come out of Egypt, Jewish sages have a ready answer. They claim that the souls of all Jews throughout history were created by Jehovah long before they were born and all these souls were present at Mount Sinai.[10] As Salvador Litvak, a Jewish social media influencer, explained to his online followers in 2018, 'You and I were there together … When we fulfill the obligation to see ourselves as if we personally left Egypt, it's not a metaphor. We don't imagine the Exodus, we remember it.'[11]

So every year, in the most important celebration of the Jewish calendar, millions of Jews put on a show that they remember things that they didn't witness and that probably never happened at all. As numerous modern studies indicate, repeatedly retelling a fake memory eventually causes the person to adopt it as a genuine recollection.[12] When two Jews encounter each other for the first time, they can immediately feel that they both belong to the same family, that they were together as slaves in Egypt, and that they were together at Mount Sinai. That's a powerful bond that has sustained the Jewish network over many centuries and continents.

## INTERSUBJECTIVE ENTITIES

The Jewish Passover story builds a large network by taking existing biological kin bonds and stretching them. It creates an imagined family of millions. But there is an even more revolutionary way for stories to build networks. Like DNA, stories can create new entities. Indeed, stories can even create an entirely new level of reality. As far as we know, prior to the emergence

of stories the universe contained just two levels of reality. Stories added a third.

The two levels of reality that preceded storytelling are objective reality and subjective reality. *Objective reality* consists of things like stones, mountains and asteroids – things that exist whether we are aware of them or not. An asteroid hurtling toward planet Earth, for example, exists even if nobody knows it's out there. Then there is *subjective reality:* things like pain, pleasure and love that aren't 'out there' but rather 'in here'. Subjective things exist in our awareness of them. An unfelt ache is an oxymoron.

But some stories are able to create a third level of reality: *intersubjective reality*. Whereas subjective things like pain exist in a single mind, intersubjective things like laws, gods, nations, corporations and currencies exist in the nexus between large numbers of minds. More specifically, they exist in the stories people tell one another. The information humans exchange about intersubjective things doesn't represent anything that had already existed prior to the exchange of information; rather, the exchange of information creates these things.

When I tell you that I am in pain, telling you about it doesn't create the pain. And if I stop talking about the pain, it doesn't make the pain go away. Similarly, when I tell you that I saw an asteroid, this doesn't create the asteroid. The asteroid exists whether people talk about it or not. But when lots of people tell one another stories about laws, gods or currencies, this is what creates these laws, gods or currencies. If people stop talking about them, they disappear. Intersubjective things exist in the exchange of information.

Let's take a closer look. The caloric value of pizza doesn't depend on our beliefs. A typical pizza contains between fifteen hundred and twenty-five hundred calories.[13] In contrast, the financial value of money – and pizzas – depends entirely on our beliefs. How many pizzas can you purchase for a dollar, or for a bitcoin? In 2010, Laszlo Hanyecz bought two pizzas for 10,000 bitcoins. It was the first known commercial transaction involving bitcoin – and with hindsight, also the most expensive pizza ever. By November 2021, a single bitcoin was valued at more than $69,000, so the bitcoins Hanyecz paid for his two pizzas were worth $690 million, enough to purchase millions of pizzas.[14] While the caloric value of pizza is an objective reality that remained the same between 2010 and 2021, the financial value of bitcoin is an intersubjective reality that changed dramatically during the same period, depending on the stories people told and believed about bitcoin.

Another example. Suppose I ask, 'Does the Loch Ness Monster exist?' This is a question about the objective level of reality. Some people believe that dinosaur-like animals really do inhabit Loch Ness. Others dismiss the idea as a fantasy or a hoax. Over the years, many attempts have been made to resolve the disagreement once and for all, using scientific methods such as sonar scans and DNA surveys. If huge animals live in the lake, they should appear on sonar, and they should leave DNA traces. Based on the available evidence, the scientific consensus is that the Loch Ness Monster does not exist. (A DNA survey conducted in 2019 found genetic material from three thousand species, but no monster. At most, Loch Ness may contain some five-kilo eels.[15] ) Many people may nevertheless continue to believe that

the Loch Ness Monster exists, but believing it doesn't change objective reality.

In contrast to animals, whose existence can be verified or disproved through objective tests, states are intersubjective entities. We normally don't notice it, because everybody takes the existence of the United States, China, Russia or Brazil for granted. But there are cases when people disagree about the existence of certain states, and then their intersubjective status emerges. The Israeli–Palestinian conflict, for example, revolves around this matter, because some people and governments refuse to acknowledge the existence of Israel and others refuse to acknowledge the existence of Palestine. As of 2024, the governments of Brazil and China, for example, say that both Israel and Palestine exist; the governments of the United States and Cameroon recognise only Israel's existence; whereas the governments of Algeria and Iran recognise only Palestine. Other cases range from Kosovo, which as of 2024 is recognised as a state by around half of the 193 UN members,[16] to Abkhazia, which almost all governments see as a sovereign territory of Georgia, but which is recognised as a state by Russia, Venezuela, Nicaragua, Nauru and Syria.[17]

Indeed, almost all states pass at least temporarily through a phase during which their existence is contested, when struggling for independence. Did the United States come into existence on 4 July 1776, or only when other states like France and finally the UK recognised it? Between the declaration of US independence on 4 July 1776, and the signing of the Treaty of Paris on 3 September 1783, some people like George Washington believed the United States existed,

while other people like King George III vehemently rejected this idea.

Disagreements about the existence of states cannot be resolved by an objective test, such as a DNA survey or a sonar scan. Unlike animals, states are not an objective reality. When we ask whether a particular state exists, we are raising a question about intersubjective reality. If enough people agree that a particular state exists, then it does. It can then do things like sign legally binding agreements with other states as well as NGOs and private corporations.

Of all genres of stories, those that create intersubjective realities have been the most crucial for the development of large-scale human networks. Implanting fake family memories is certainly helpful, but no religions or empires managed to survive for long without a strong belief in the existence of a god, a nation, a law code or a currency. For the formation of the Christian Church, for example, it was important that people recollect what Jesus said at the Last Supper, but the crucial step was making people believe that Jesus was a god rather than just an inspiring rabbi. For the formation of the Jewish religion, it was helpful that Jews 'remembered' how they together escaped slavery in Egypt, but the really decisive step was making all Jews adhere to the same religious law code, the *Halakha*.

Intersubjective things like laws, gods and currencies are extremely powerful within a particular information network and utterly meaningless outside it. Suppose a billionaire crashes his private jet on a desert island and finds himself alone with a suitcase full of banknotes and bonds. When he was in São Paulo or Mumbai, he could use these papers to make people feed him, clothe him, protect him and build him a private jet. But once he is cut

off from other members of our information network, his banknotes and bonds immediately become worthless. He cannot use them to get the island's monkeys to provide him with food or to build him a raft.

## THE POWER OF STORIES

Whether through implanting fake memories, forming fictional relationships or creating intersubjective realities, stories produced large-scale human networks. These networks in turn completely changed the balance of power in the world. Story-based networks made *Homo sapiens* the most powerful of all animals, giving it a crucial edge not only over lions and mammoths but also over other ancient human species like Neanderthals.

Neanderthals lived in small isolated bands, and to the best of our knowledge different bands cooperated with one another only rarely and weakly, if at all.[18] Stone Age Sapiens too lived in small bands of a few dozen individuals. But following the emergence of storytelling, Sapiens bands no longer lived in isolation. Bands were connected by stories about things like revered ancestors, totem animals and guardian spirits. Bands that shared stories and intersubjective realities constituted a tribe. Each tribe was a network connecting hundreds or even thousands of individuals.[19]

Belonging to a large tribe had an obvious advantage in times of conflict. Five hundred Sapiens could easily defeat fifty Neanderthals.[20] But tribal networks had many additional advantages. If we live in an isolated band of fifty people and a severe drought hits our home territory, many of us might starve to death. If we try to migrate elsewhere, we are likely to encounter hostile groups, and we might also find it difficult to forage

for food, water and flint (to make tools) in unfamiliar territory. However, if our band is part of a tribal network, in times of need at least some of us could go to live with our distant friends. If our shared tribal identity is strong enough, they would welcome us and teach us about the local dangers and opportunities. A decade or two later, we might reciprocate. The tribal network, then, acted like an insurance policy. It minimised risk by spreading it across a lot more people.[21]

Even in quiet times Sapiens could benefit enormously from exchanging information not just with a few dozen members of a small band but with an entire tribal network. If one of the tribe's bands discovered a better way to make spear points, learned how to heal wounds with some rare medicinal herb or invented a needle to sew clothes, that knowledge could be quickly passed to the other bands. Even though individually Sapiens might not have been more intelligent than Neanderthals, five hundred Sapiens together were far more intelligent than fifty Neanderthals.[22]

All this was made possible by stories. The power of stories is often missed or denied by materialist interpretations of history. In particular, Marxists tend to view stories as merely a smoke screen for underlying power relations and material interests. According to Marxist theories, people are always motivated by objective material interests and use stories only to camouflage these interests and confound their rivals. For example, in this reading the Crusades, the First World War and the Iraq War were all fought for the economic interests of powerful elites rather than for religious, nationalist or liberal ideals. Understanding these wars means setting aside all the mythological fig leaves –

about God, patriotism or democracy – and observing power relations in their nakedness.

This Marxist view, however, is not only cynical but wrong. While materialist interests certainly played a role in the Crusades, the First World War, the Iraq War and most other human conflicts, that does not mean that religious, national and liberal ideals played no role at all. Moreover, materialist interests by themselves cannot explain the identities of the rival camps. Why is it that in the twelfth century landowners and merchants from France, Germany and Italy united to conquer territories and trade routes in the Levant – instead of landowners and merchants from France and North Africa uniting to conquer Italy? And why is it that in 2003 the United States and Britain sought to conquer the oil fields of Iraq, rather than the gas fields of Norway? Can this really be explained by purely materialist considerations, without any recourse to people's religious and ideological beliefs?

In fact, all relations between large-scale human groups are shaped by stories, because the identities of these groups are themselves defined by stories. There are no objective definitions for who is British, American, Norwegian or Iraqi; all these identities are shaped by national and religious myths that are constantly challenged and revised. Marxists may claim that large-scale groups have objective identities and interests, independent of stories. If that is so, how can we explain that only humans have large-scale groups like tribes, nations and religions, whereas chimpanzees lack them? After all, chimpanzees share with humans all our objective material interests; they too need to drink, eat and protect themselves from diseases. They too want sex and social power. But chimpanzees cannot maintain

large-scale groups, because they are unable to create the stories that connect such groups and define their identities and interests. Contrary to Marxist thinking, large-scale identities and interests in history are always intersubjective; they are never objective.

This is good news. If history had been shaped solely by material interests and power struggles, there would be no point talking to people who disagree with us. Any conflict would ultimately be the result of objective power relations, which cannot be changed merely by talking. In particular, if privileged people can see and believe only those things that enshrine their privileges, how can anything except violence persuade them to renounce those privileges and alter their beliefs? Luckily, since history is shaped by intersubjective stories, sometimes we can avert conflict and make peace by talking with people, changing the stories in which they and we believe, or coming up with a new story that everyone can accept.

Take, for example, the rise of Nazism. There certainly were material interests that drove millions of Germans to support Hitler. The Nazis would probably never have come to power had it not been for the economic crisis of the early 1930s. However, it is wrong to think that the Third Reich was the inevitable outcome of underlying power relations and material interests. Hitler won the 1933 elections because during the economic crisis millions of Germans came to believe the Nazi story rather than one of the alternative stories on offer. This wasn't the inevitable result of Germans pursuing their material interests and protecting their privileges; it was a tragic mistake. We can confidently say that it was a mistake, and that Germans could have chosen better stories, because we know what happened next. Twelve

years of Nazi rule didn't foster the Germans' material interests. Nazism led to the destruction of Germany and the deaths of millions. Later, when Germans adopted liberal democracy, this did lead to a lasting improvement in their lives. Couldn't the Germans have skipped the failed Nazi experiment and put their faith in liberal democracy already in the early 1930s? The position of this book is that they could have. History is often shaped not by deterministic power relations, but rather by tragic mistakes that result from believing in mesmerising but harmful stories.

## THE NOBLE LIE

The centrality of stories reveals something fundamental about the power of our species, and it explains why power doesn't always go hand in hand with wisdom. The naive view of information says that information leads to truth, and knowing the truth helps people to gain both power and wisdom. This sounds reassuring. It implies that people who ignore the truth are unlikely to have much power, whereas people who respect the truth can gain much power, but that power would be tempered by wisdom. For example, people who ignore the truth about human biology might believe racist myths but will not be able to produce powerful medicines and bioweapons, whereas people who understand biology will have that kind of power but will not use it in the service of racist ideologies. If this had indeed been the case, we could sleep calmly, trusting our presidents, high priests and CEOs to be wise and honest. A politician, a movement or a country might conceivably get ahead here and there with the help of lies and deceptions, but in the long term that would be a self-defeating strategy.

Unfortunately, this is not the world in which we live. In history, power stems only partially from knowing the truth. It also stems from the ability to maintain social order among a large number of people. Suppose you want to make an atom bomb. To succeed, you obviously need some accurate knowledge of physics. But you also need lots of people to mine uranium ore, build nuclear reactors and provide food for the construction workers, miners and physicists. The Manhattan Project directly employed about 130,000 people, with millions more working to sustain them.[23] Robert Oppenheimer could devote himself to his equations because he relied on thousands of miners to extract uranium at the Eldorado mine in northern Canada and the Shinkolobwe mine in the Belgian Congo[24] – not to mention the farmers who grew potatoes for his lunch. If you want to make an atom bomb, you must find a way to make millions of people cooperate.

It is the same with all ambitious projects that humans undertake. A Stone Age band going to hunt a mammoth obviously needed to know some facts about mammoths. If they believed they could kill a mammoth by casting spells, their hunting expedition would have failed. But knowing facts about mammoths wasn't enough. The hunters also needed to risk death and show great courage. If they believed that a certain spell guaranteed a good afterlife for dead hunters, their hunting expeditions had a much higher chance of success. Even if the spell did not benefit dead hunters in any way, by fortifying the courage and solidarity of living hunters, it made a crucial contribution to the hunt's success.[25]

If you build a bomb and ignore the facts of physics, the bomb will not explode. But if you build an ideology and ignore the facts, the ideology may

still prove explosive. While power depends on both truth and order, it is usually the people who know how to build ideologies and maintain order who give instructions to the people who merely know how to build bombs or hunt mammoths. Robert Oppenheimer obeyed Franklin Delano Roosevelt rather than the other way around. Similarly, Werner Heisenberg obeyed Adolf Hitler, Igor Kurchatov deferred to Joseph Stalin, and in contemporary Iran experts in nuclear physics follow the orders of experts in Shiite theology.

What the people at the top know, which nuclear physicists don't always realise, is that telling the truth about the universe is hardly the most efficient way to produce order among large numbers of humans. It is true that $E = mc^2$, and it explains a lot of what happens in the universe, but knowing that $E = mc^2$ usually doesn't resolve political disagreements or inspire people to make sacrifices for a common cause. Instead, what holds human networks together tends to be fictional stories, especially stories about intersubjective things like gods, money and nations. When it comes to uniting people, fiction enjoys two inherent advantages over the truth. First, fiction can be made as simple as we like, whereas the truth tends to be complicated, because the reality it is supposed to represent is complicated. Take, for example, the truth about nations. It is difficult to grasp that the nation to which one belongs is an intersubjective entity that exists only in our collective imagination. You rarely hear politicians say such things in their political speeches. It is far easier to believe that our nation is God's chosen people, entrusted by the Creator with some special mission. This simple story has been repeatedly told by countless politicians from Israel to Iran and from the United States to Russia.

Second, the truth is often painful and disturbing, and if we try to make it more comforting and flattering, it will no longer be the truth. In contrast, fiction is highly malleable. The history of every nation contains some dark episodes that citizens don't like to acknowledge and remember. An Israeli politician who in her election speeches details the miseries inflicted on Palestinian civilians by the Israeli occupation is unlikely to get many votes. In contrast, a politician who builds a national myth by ignoring uncomfortable facts, focusing on glorious moments in the Jewish past and embellishing reality wherever necessary may well sweep to power. That's the case not just in Israel but in all countries. How many Italians or Indians want to hear the unblemished truth about their nations? An uncompromising adherence to the truth is essential for scientific progress, and it is also an admirable spiritual practice, but it is not a winning political strategy.

Already in his *Republic*, Plato imagined that the constitution of his utopian state would be based on 'the noble lie' – a fictional story about the origin of the social order, one that secures the citizens' loyalty and prevents them from questioning the constitution. Citizens should be told, Plato wrote, that they were all born out of the earth, that the land is their mother and that they therefore owe filial loyalty to the motherland. They should further be told that when they were conceived, the gods intermingled different metals – gold, silver, bronze and iron – into them, which justifies a natural hierarchy between golden rulers and bronze servants. While Plato's utopia was never realised in practice, numerous polities through the ages told their inhabitants variations of this noble lie.

Plato's noble lie notwithstanding, we should not conclude that all politicians are liars or that all national histories are deceptions. The choice isn't simply between telling the truth and lying. There is a third option. Telling a fictional story is lying only when you pretend that the story is a true representation of reality. Telling a fictional story isn't lying when you avoid such pretense and acknowledge that you are trying to create a new intersubjective reality rather than represent a preexisting objective reality.

For example, on 17 September 1787, the Constitutional Convention signed the US Constitution, which came into force in 1789. The Constitution didn't reveal any pre-existing truth about the world, but crucially it wasn't a lie, either. Rejecting Plato's recommendation, the authors of the text didn't deceive anyone about the text's origins. They didn't pretend that the text came down from heaven or that it had been inspired by some god. Rather, they acknowledged that it was an extremely creative legal fiction generated by fallible human beings.

'We the People of the United States,' says the Constitution about its own origins, 'in Order to form a more perfect Union … do ordain and establish this Constitution.' Despite the acknowledgment that it is a human-made legal fiction, the US Constitution indeed managed to form a powerful union. It has maintained for more than two centuries a surprising degree of order among many millions of people who belong to a wide range of religious, ethnic and cultural groups. The US Constitution has thus functioned like a tune that without claiming to represent anything has nevertheless made numerous people act together in order.

It is crucial to note that 'order' should not be confused with fairness or justice. The order created and maintained by the US Constitution condoned slavery, the subordination of women, the expropriation of indigenous people and extreme economic inequality. The genius of the US Constitution is that by acknowledging that it is a legal fiction created by human beings, it was able to provide mechanisms to reach agreement on amending itself and remedying its own injustices (as chapter 5 explores in greater depth). The Constitution's Article V details how people can propose and ratify such amendments, which 'shall be valid to all Intents and Purposes, as Part of this Constitution'. Less than a century after the Constitution was written, the Thirteenth Amendment abolished slavery.

In this, the US Constitution was fundamentally different from stories that denied their fictive nature and claimed divine origin, such as the Ten Commandments. Like the US Constitution, the Ten Commandments endorsed slavery. The Tenth Commandment says, 'You shall not covet your neighbour's house. You shall not covet your neighbour's wife, or his male slave or female slave' (Exodus 20:17). This implies that God is perfectly okay with people holding slaves, and objects only to the coveting of slaves belonging to someone else. But unlike the US Constitution, the Ten Commandments failed to provide any amendment mechanism. There is no Eleventh Commandment that says, 'You can amend commandments by a two-thirds majority vote.'

This crucial difference between the two texts is clear from their opening gambits. The US Constitution opens with 'We the People'. By acknowledging its human origin, it invests humans with the power to amend it. The Ten Commandments open with 'I am the Lord your

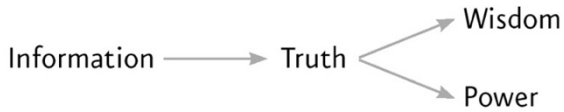
God.' By claiming divine origin, it precludes humans from changing it. As a result, the biblical text still endorses slavery even today.

All human political systems are based on fictions, but some admit it, and some do not. Being truthful about the origins of our social order makes it easier to make changes in it. If humans like us invented it, we can amend it. But such truthfulness comes at a price. Acknowledging the human origins of the social order makes it harder to persuade everyone to agree on it. If humans like us invented it, why should we accept it? As we shall see in chapter 5, until the late eighteenth century the lack of mass communication technology made it extremely difficult to conduct open debates between millions of people about the rules of the social order. To maintain order, Russian tsars, Muslim caliphs and Chinese sons of heaven therefore claimed that the fundamental rules of society came down from heaven and were not open to human amendment. In the early twenty-first century, many political systems still claim superhuman authority and oppose open debates that may result in unwelcome changes.

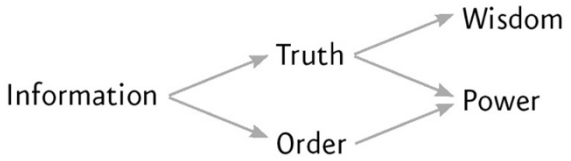
## THE PERENNIAL DILEMMA

After we understand the key role of fiction in history, it is finally possible to present a more complete model of information networks, which goes beyond both the naive view of information and the populist critique of that view. Contrary to the naive view, information isn't the raw material of truth, and human information networks aren't geared only to discover the truth. But contrary to the populist view, information isn't just a weapon, either. Rather, to survive and flourish,

every human information network needs to do two things simultaneously: discover truth *and create order*. Accordingly, as history unfolded, human information networks have been developing two distinct sets of skills. On the one hand, as the naive view expects, the networks have learned how to process information to gain a more accurate understanding of things like medicine, mammoths and nuclear physics. At the same time, the networks have also learned how to use information to maintain stronger social order among larger populations, by using not just truthful accounts but also fictions, fantasies, propaganda and – occasionally – downright lies.




**The naive view of information**




**A more complete historical view of information**

Having a lot of information doesn't in and of itself guarantee either truth or order. It is a difficult process to use information to discover the truth and simultaneously use it to maintain order. What makes things worse is that these two processes are often contradictory, because it is frequently easier to maintain order through fictions. Sometimes – as in the case of the US Constitution – fictional stories may acknowledge their fictionality, but more often they disavow it. Religions, for example, always claim to be an objective and eternal truth rather than a fictional story invented

by humans. In such cases, the search for truth threatens the foundations of the social order. Many societies require their populations *not to know* their true origins: ignorance is strength. What happens, then, when people get uncomfortably close to the truth? What happens when the same bit of information reveals an important fact about the world, and also undermines the noble lie that holds society together? In such cases society may seek to preserve order by placing limits on the search for truth.

One obvious example is Darwin's theory of evolution. Understanding evolution greatly advances our understanding of the origins and biology of species, including *Homo sapiens*, but it also undermines the central myths that maintain order in numerous societies. No wonder that various governments and churches have banned or limited the teaching of evolution, preferring to sacrifice truth for the sake of order.[26]

A related problem is that an information network may allow and even encourage people to search for truth, but only in specific fields that help generate power without threatening the social order. The result can be a very powerful network that is singularly lacking in wisdom. Nazi Germany, for example, cultivated many of the world's leading experts in chemistry, optics, engineering and rocket science. It was largely Nazi rocket science that later took the Americans to the moon.[27] This scientific prowess helped the Nazis build an extremely powerful war machine, which was then deployed in the service of a deranged and murderous mythology. Under Nazi rule Germans were encouraged to develop rocket science, but they were not free to question racist theories about biology and history.

That's a major reason why the history of human information networks isn't a triumphant march of progress. While over the generations human networks have grown increasingly powerful, they have not necessarily grown increasingly wise. If a network privileges order over truth, it can become very powerful but use that power unwisely.

Instead of a march of progress, the history of human information networks is a tightrope walk trying to balance truth with order. In the twenty-first century we aren't much better at finding the right balance than our ancestors were in the Stone Age. Contrary to what the mission statements of corporations like Google and Facebook imply, simply increasing the speed and efficiency of our information technology doesn't necessarily make the world a better place. It only makes the need to balance truth and order more urgent. The invention of the story taught us this lesson already tens of thousands of years ago. And the same lesson would be taught again, when humans came up with their second great information technology: the written document.