

A Brief History of Humankind



Sapiens

Yuval Noah
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In loving memory of my father, Shlomo Harari

紀念我的父親Shlomo Harari，永遠懷念。

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Timeline of History

Years

*Before
the
Present*

- 13.5 billion Matter and energy appear. Beginning of physics. Atoms and molecules appear. Beginning of chemistry.
- 4.5 billion Formation of planet Earth.
- 3.8 billion Emergence of organisms. Beginning of biology.
- 6 million Last common grandmother of humans and chimpanzees.
- 2.5 million Evolution of the genus *Homo* in Africa. First stone tools.
- 2 million Humans spread from Africa to Eurasia. Evolution of different human species.
- 500,000 Neanderthals evolve in Europe and the Middle East.
- 300,000 Daily usage of fire.
- 200,000 *Homo sapiens* evolves in East Africa.
- 70,000 The Cognitive Revolution. Emergence of fictive language. Beginning of history. Sapiens spread out of Africa.
- 45,000 Sapiens settle Australia. Extinction of Australian megafauna.
- 30,000 Extinction of Neanderthals.
- 16,000 Sapiens settle America. Extinction of American megafauna.
- 13,000 Extinction of *Homo floresiensis*. *Homo sapiens* the only surviving human species.
- 12,000 The Agricultural Revolution. Domestication of plants and animals. Permanent settlements.
- 5,000 First kingdoms, script and money. Polytheistic religions.
- 4,250 First empire – the Akkadian Empire of Sargon.

	Invention of coinage – a universal money.
2,500	The Persian Empire – a universal political order ‘for the benefit of all humans’.
	Buddhism in India – a universal truth ‘to liberate all beings from suffering’.
2,000	Han Empire in China. Roman Empire in the Mediterranean. Christianity.
1,400	Islam.
500	The Scientific Revolution. Humankind admits its ignorance and begins to acquire unprecedented power. Europeans begin to conquer America and the oceans. The entire planet becomes a single historical arena. The rise of capitalism.
200	The Industrial Revolution. Family and community are replaced by state and market. Massive extinction of plants and animals.
The Present	Humans transcend the boundaries of planet Earth. Nuclear weapons threaten the survival of humankind. Organisms are increasingly shaped by intelligent design rather than natural selection.
The Future	Intelligent design becomes the basic principle of life? <i>Homo sapiens</i> is replaced by superhumans?

Part One

The Cognitive Revolution



1. A human handprint made about 30,000 years ago, on the wall of the Chauvet-Pont-d'Arc Cave in southern France. Somebody tried to say, 'I was here!'

1. 約三萬年前，在法國南部的肖韋-庞特达克洞穴的牆上印有一個人類手印。有人試圖說：“我來過這裡！”

1

An Animal of No Significance

ABOUT 13.5 BILLION YEARS AGO, MATTER, energy, time and space came into being in what is known as the Big Bang. The story of these fundamental features of our universe is called physics.

About 300,000 years after their appearance, matter and energy started to coalesce into complex structures, called atoms, which then combined into molecules. The story of atoms, molecules and their interactions is called chemistry.

About 3.8 billion years ago, on a planet called Earth, certain molecules combined to form particularly large and intricate structures called organisms. The story of organisms is called biology.

About 70,000 years ago, organisms belonging to the species *Homo sapiens* started to form even more elaborate structures called cultures. The subsequent development of these human cultures is called history.

大約135億年前，物質、能量、時間和空間在所謂的大爆炸中誕生。這些基本特徵的故事被稱為物理學。在它們出現約30萬年後，物質和能量開始凝聚成複雜的結構，被稱為原子，然後結合成分子。原子、分子及其相互作用的故事被稱為化學。大約38億年前，在一個叫地球的行星上，某些分子結合形成特別大而複雜的結構，被稱為生物體。生物體的故事被稱為生物學。大約7萬年前，屬於智人物種的生物體開始形成更加精細的結構，被稱為文化。這些人類文化的發展被稱為歷史。

Three important revolutions shaped the course of history: the Cognitive Revolution kick-started history about 70,000 years ago. The Agricultural Revolution sped it up about 12,000 years ago. The Scientific Revolution, which got under way only 500 years ago, may well end history and start

something completely different. This book tells the story of how these three revolutions have affected humans and their fellow organisms.

There were humans long before there was history. Animals much like modern humans first appeared about 2.5 million years ago. But for countless generations they did not stand out from the myriad other organisms with which they shared their habitats.

On a hike in East Africa 2 million years ago, you might well have encountered a familiar cast of human characters: anxious mothers cuddling their babies and clutches of carefree children playing in the mud; temperamental youths chafing against the dictates of society and weary elders who just wanted to be left in peace; chest-thumping machos trying to impress the local beauty and wise old matriarchs who had already seen it all. These archaic humans loved, played, formed close friendships and competed for status and power – but so did chimpanzees, baboons and elephants. There was nothing special about them. Nobody, least of all humans themselves, had any inkling that their descendants would one day walk on the moon, split the atom, fathom the genetic code and write history books. The most important thing to know about prehistoric humans is that they were insignificant animals with no more impact on their environment than gorillas, fireflies or jellyfish.

三次重要的革命塑造了歷史的脈絡：認知革命大約在70,000年前開啟歷史。農業革命約在12,000年前加快了歷史的速度。科學革命僅在500年前開始，有可能結束歷史並開始全新的事物。這本書講述了這三次革命如何影響了人類及其同伴生物。早在有歷史之前，就已經有人類存在了。大約在2,500萬年前，出現了許多像現代人類一樣的動物。但是，無數代他們都沒有與其他生物區分開來。在2,000萬年前東非的一次徒步旅行中，你可能會遇到一眾熟悉的人物：焦慮的母親擁抱他們的嬰兒，一群在泥濘中玩耍的無憂無慮的孩子；性情古怪的年輕人不遵從社會規範的限制，疲憊的長者只想獨自一人，為提高地位和權力而努力的展示肌肉的漢子和已經經歷過一切的智慧老族母親。這些古老的人類愛，玩，建立緊密的友誼並競爭地位和權力- 但黑猩猩，狒狒和大象也是如此。他們沒有任何特別之處。沒有人，尤其是人類自己，會想到他們的後代有一天會走上月球，分裂原子，解密基因並編寫歷史書。關於史前人類最重要的事情，是他們是不重要的動物，對環境的影響不比大猩猩，螢火蟲或水母更大。

Biologists classify organisms into species. Animals are said to belong to the same species if they tend to mate with each other, giving birth to fertile offspring. Horses and donkeys have a recent common ancestor and share many physical traits. But they show little sexual interest in one another. They will mate if induced to do so – but their offspring, called mules, are sterile. Mutations in donkey DNA can therefore never cross over to horses, or vice versa. The two types of animals are consequently considered two distinct species, moving along separate evolutionary paths. By contrast, a bulldog and a spaniel may look very different, but they are members of the same species, sharing the same DNA pool. They will happily mate and their puppies will grow up to pair off with other dogs and produce more puppies.

生物學家將生物分類為物種。如果動物傾向於交配，並生出能繁殖的後代，則被認為屬於同一物種。馬和驢有一個最近的共同祖先，並且共享許多身體特徵，但它們對彼此表現出很少的性興趣。如果它們被誘導結合，則它們會交配，但它們的後代（稱為驃子）是不育的。驢的DNA突變因此永遠無法跨越至馬，反之亦然。因此，這兩種不同類型的動物被認為是兩個不同的物種，分別沿著不同的演化路徑前進。相比之下，鬥牛犬和西班牙獵犬可能外觀截然不同，但它們是同一物種的成員，共享相同的DNA池。它們會快樂地交配，它們的小狗將長大找到其他狗配對並生出更多小狗。

Species that evolved from a common ancestor are bunched together under the heading ‘genus’ (plural genera). Lions, tigers, leopards and jaguars are different species within the genus *Panthera*. Biologists label organisms with a two-part Latin name, genus followed by species. Lions, for example, are called *Panthera leo*, the species *leo* of the genus *Panthera*. Presumably, everyone reading this book is a *Homo sapiens* – the species *sapiens* (wise) of the genus *Homo* (man).

Genera in their turn are grouped into families, such as the cats (lions, cheetahs, house cats), the dogs (wolves, foxes, jackals) and the elephants (elephants, mammoths, mastodons). All members of a family trace their lineage back to a founding matriarch or patriarch. All cats, for example, from the smallest house kitten to the most ferocious lion, share a common feline ancestor who lived about 25 million years ago.

演化自共同祖先的物種，在「屬」（複數為「科」）這個範疇下被歸類在一起。獅子、老虎、豹子和美洲豹都是屬於豹屬之下的不同物種。生物學家會用兩個拉丁名稱來標記生物，先給出屬的名字然後再接著種的名字。例如，獅子的學名就是*Panthera leo*，其中*Panthera*是屬的名字，*leo*則是獅子的種。假設每個讀這本書的人都是智人（*Homo sapiens*），智人就是屬於人屬（*Homo*）之下的品種。科之間又被歸類在不同的族群，例如貓科（獅子、獵豹、家貓）、犬科（狼、狐狸、豺狼）和象科（象、猛犸象、乳齒象）。每個族群的成員都可以追溯到一個創始的巨額或母類祖先。例如，所有貓科動物，無論是最小的家貓幼貓還是最兇猛的獅子，都有一個大約在2500萬年前的貓科共同祖先。

Homo sapiens , too, belongs to a family. This banal fact used to be one of history's most closely guarded secrets. *Homo sapiens* long preferred to view itself as set apart from animals, an orphan bereft of family, lacking siblings or cousins, and most importantly, without parents. But that's just not the case. Like it or not, we are members of a large and particularly noisy family called the great apes. Our closest living relatives include chimpanzees, gorillas and orang-utans. The chimpanzees are the closest. Just 6 million years ago, a single female ape had two daughters. One became the ancestor of all chimpanzees, the other is our own grandmother.

Skeletons in the Closet

Homo sapiens has kept hidden an even more disturbing secret. Not only do we possess an abundance of uncivilised cousins, once upon a time we had quite a few brothers and sisters as well. We are used to thinking about ourselves as the only humans, because for the last 10,000 years, our species has indeed been the only human species around. Yet the real meaning of the word human is ‘an animal belonging to the genus *Homo* ’, and there used to be many other species of this genus besides *Homo sapiens* . Moreover, as we shall see in the last chapter of the book, in the not so distant future we might again have to contend with non -*sapiens* humans. To clarify this point, I will often use the term ‘Sapiens’ to denote members of the species *Homo sapiens* , while reserving the term ‘human’ to refer to all extant members of the genus *Homo* .

人類也屬於一個家族。這個平凡的事實曾經是歷史上極為保密的秘密之一。長久以來，人類傾向於認為自己與動物有所區別，是一個失去家人的孤兒，沒有兄弟姊妹，最重要的是，沒有父母。但事實並非如此。不管喜歡與否，我們屬於一個叫做大猩猩的大型、尤其吵鬧不停的家族。我們最接近的近親包括黑猩猩、大猩猩和猩猩。黑猩猩是最接近的親戚。僅僅在600萬年前，一隻母猿生下了兩個女兒。其中一個成了所有黑猩猩的祖先，另一個則是我們自己的祖母。人類還隱藏著一個更加令人不安的秘密。不僅我們擁有豐富的未開化的表親，曾經還有很多兄弟姊妹。我們習慣於把自己看作唯一的人類，因為在過去的一萬年中，我們的物種確實是唯一存在的。然而，“人”字的真正意義是“屬於人屬(*Homo*)的動物”，除了現代人(智人)以外，這個屬還有很多其他物種。此外，正如我們書中最後一章會看到的那樣，就在不遠的將來，我們可能再次不得不面對非智人的人類。為了澄清這一點，我經常使用“智人”一詞來表示屬於*Homo sapiens*物種的成員，而把“人”這個詞留給了*Homo*屬物種的所有現存成員。

Humans first evolved in East Africa about 2.5 million years ago from an earlier genus of apes called *Australopithecus* , which means ‘Southern Ape’. About 2 million years ago, some of these archaic men and women left their homeland to journey through and settle vast areas of North Africa, Europe and Asia. Since survival in the snowy forests of northern Europe required different traits than those needed to stay alive in Indonesia’s steaming jungles, human populations evolved in different directions. The result was several distinct species, to each of which scientists have assigned a pompous Latin name.



2. Our siblings, according to speculative reconstructions (left to right): *Homo rudolfensis* (East Africa); *Homo erectus* (East Asia); and *Homo neanderthalensis* (Europe and western Asia). All are humans .

人類最初在約250萬年前經東非的前身為南方猿的古猿類型 - 南猿類 (*Australopithecus*) 進化而來。約200萬年前，部分古人類從家鄉出發並穿越並定居於北非、歐洲和亞洲的廣大區域。由於在北歐雪林中生存需要與在印尼的熱帶雨林生存所需的特質不同，人類族群朝不同方向進化。因此，結果是幾個不同的物種，科學家為每個物種指定了一個自以為是的拉丁名稱。2. 根據推測重構，我們的同胞(由左至右): 古人種 (*Homo rudolfensis*) (東非)、直立人 (*Homo erectus*) (東亞) 和尼安德特人 (*Homo neanderthalensis*) (歐洲和西亞)。所有這些都是人類。

Humans in Europe and western Asia evolved into *Homo neanderthalensis* ('Man from the Neander Valley), popularly referred to simply as 'Neanderthals'. Neanderthals, bulkier and more muscular than us Sapiens, were well adapted to the cold climate of Ice Age western Eurasia. The more eastern regions of Asia were populated by *Homo erectus*, 'Upright Man', who survived there for close to 2 million years, making it the most durable human species ever. This record is unlikely to be broken even by our own species. It is doubtful whether *Homo sapiens* will still be around a thousand years from now, so 2 million years is really out of our league.

On the island of Java, in Indonesia, lived *Homo soloensis* , ‘Man from the Solo Valley’ , who was suited to life in the tropics. On another Indonesian island – the small island of Flores – archaic humans underwent a process of dwarfing. Humans first reached Flores when the sea level was exceptionally low, and the island was easily accessible from the mainland. When the seas rose again, some people were trapped on the island, which was poor in resources. Big people, who need a lot of food, died first. Smaller fellows survived much better. Over the generations, the people of Flores became dwarves. This unique species, known by scientists as *Homo floresiensis* , reached a maximum height of only one metre and weighed no more than twenty-five kilograms. They were nevertheless able to produce stone tools, and even managed occasionally to hunt down some of the island’s elephants – though, to be fair, the elephants were a dwarf species as well.

人类在欧洲和西亚逐渐演化成了尼安德特人（“尼安德特谷之人”），通常简称为“尼安德特人”。尼安德特人比我们智人更加庞大和肌肉发达，非常适应冰河期西欧亚寒冷的气候。亚洲东部地区则由站立人居住，他们在那里生存了接近两百万年，是迄今为止最持久的人类物种。这个纪录即使在我们自己的物种中也不可能被打破。值得怀疑的是，智人是否能够存留一千年之久，所以两百万年实在超出了我们承受的范围。在印度尼西亚的爪哇岛居住着索洛谷人（“索洛谷之人”），他适应热带地区的生活。还有另一座印尼小岛弗洛勒斯岛，其原始人类经历了侏儒化的进程。当海平面异常低时，人类首次到达弗洛勒斯岛并且很容易从大陆进入该岛。当海水再次上升时，有些人被困在了这座资源匮乏的岛屿上，大个子需要更多的食物，因此先死亡了。而体型小一些的人更容易生存下来。在几代人的努力下，弗洛勒斯人变成了侏儒。这个独特的人种，被科学家称为弗洛勒斯人，最高身高仅有一米，重量不超过二十五公斤。他们还能够制作石器，并且偶尔成功地猎杀了该岛的一些象 - 当然，这些大象也是侏儒物种。

In 2010 another lost sibling was rescued from oblivion, when scientists excavating the Denisova Cave in Siberia discovered a fossilised finger bone. Genetic analysis proved that the finger belonged to a previously unknown human species, which was named *Homo denisova* . Who knows how many lost relatives of ours are waiting to be discovered in other caves, on other islands, and in other climes.

While these humans were evolving in Europe and Asia, evolution in East Africa did not stop. The cradle of humanity continued to nurture numerous new species, such as *Homo rudolfensis* , ‘Man from Lake Rudolf’, *Homo ergaster* , ‘Working Man’, and eventually our own species, which we’ve immodestly named *Homo sapiens* , ‘Wise Man’.

The members of some of these species were massive and others were dwarves. Some were fearsome hunters and others meek plant-gatherers. Some lived only on a single island, while many roamed over continents. But all of them belonged to the genus *Homo* . They were all human beings.

2010年，科學家在西伯利亞的丹尼索瓦洞穴發現了化石化手指骨，從而拯救了另外一個失落的手足。基因分析證明這個手指屬於以前未知的人種，被命名為丹尼索瓦人。誰知道我們還有多少失散的親戚在其他洞穴、其他島嶼和其他氣候中等待發現呢？當這些人類在歐洲和亞洲進化時，東非的演化並沒有停止。人類的搖籃繼續孕育出許多新物種，例如路德爾夫人、工作人和最終的我們自己的物種。我們自負地稱為智人。這些物種的成員有的巨大，有的是侏儒。有些是可怕的獵人，有些則是溫和的採集者。有些僅生活在一個島嶼上，而多數漫遊大陸。但是它們都屬於人類屬。它們都是人類。

It’s a common fallacy to envision these species as arranged in a straight line of descent, with Ergaster begetting Erectus, Erectus begetting the Neanderthals, and the Neanderthals evolving into us. This linear model gives the mistaken impression that at any particular moment only one type of human inhabited the earth, and that all earlier species were merely older models of ourselves. The truth is that from about 2 million years ago until around 10,000 years ago, the world was home, at one and the same time, to several human species. And why not? Today there are many species of foxes, bears and pigs. The earth of a hundred millennia ago was walked by at least six different species of man. It’s our current exclusivity, not that multi-species past, that is peculiar – and perhaps incriminating. As we will shortly see, we Sapiens have good reasons to repress the memory of our siblings.

將這些物種視為一條直線的演化線，以埃爾加斯特產生直立人，直立人產生尼安德特人，而尼安德特人進化成我們，這是一種常見的錯誤觀念。這種線性模型錯誤地給人一種印象，即在特定時刻，只有一種

類型的人類棲息在地球上，而所有早期的物種只是我們自己的老模型。事實上，從約200萬年前到約10000年前，世界上同時居住著幾種人類物種。為什麼不呢？今天有許多狐狸，熊和豬的物種。十萬年前的地球上至少有六種不同的人類物種。我們目前的專屬性，而不是多種物種的過去，才是奇怪的，也許是有罪的。正如我們將立即看到的那樣，我們智人有很好的理由壓抑我們兄弟的記憶。

The Cost of Thinking

Despite their many differences, all human species share several defining characteristics. Most notably, humans have extraordinarily large brains compared to other animals. Mammals weighing sixty kilograms have an average brain size of 200 cubic centimetres. The earliest men and women, 2.5 million years ago, had brains of about 600 cubic centimetres. Modern Sapiens sport a brain averaging 1,200–1,400 cubic centimetres. Neanderthal brains were even bigger.

That evolution should select for larger brains may seem to us like, well, a no-brainer. We are so enamoured of our high intelligence that we assume that when it comes to cerebral power, more must be better. But if that were the case, the feline family would also have produced cats who could do calculus. Why is genus *Homo* the only one in the entire animal kingdom to have come up with such massive thinking machines?

儘管有許多差異，所有人類物種都具有幾個定義性特徵。最明顯的是，與其他動物相比，人類的大腦特別大。體重60公斤的哺乳動物平均大腦大小為200立方厘米。250萬年前的最早的男人和女人大腦大小約為600立方厘米。現代人類平均大腦大小為1,200-1,400立方厘米。尼安德塔人的大腦甚至更大。進化選擇大腦更大可能對我們而言像是沒有頭腦的決定。我們對自己高智商的崇拜使我們認為，在大腦能量方面，更多必定是更好的。但如果真的是這樣，貓科也會培育出會做微積分的貓。為什麼人亞科是整個動物界中唯一一個創造出如此龐大的思考機器的物種？

The fact is that a jumbo brain is a jumbo drain on the body. It's not easy to carry around, especially when encased inside a massive skull. It's even

harder to fuel. In *Homo sapiens*, the brain accounts for about 2–3 per cent of total body weight, but it consumes 25 per cent of the body's energy when the body is at rest. By comparison, the brains of other apes require only 8 per cent of rest-time energy. Archaic humans paid for their large brains in two ways. Firstly, they spent more time in search of food. Secondly, their muscles atrophied. Like a government diverting money from defence to education, humans diverted energy from biceps to neurons. It's hardly a foregone conclusion that this is a good strategy for survival on the savannah. A chimpanzee can't win an argument with a *Homo sapiens*, but the ape can rip the man apart like a rag doll.

一個事實是巨腦是對身體的巨大負擔。特別是當它包裹在巨大的頭骨內時，攜帶起來並不容易。而且，它更難加以餵養。在智人中，大腦占總體重的約2-3%，但當身體處於休息狀態時，它消耗身體能量的25%。相比之下，其他類人猿的大腦只需要占用8%的休息時間能量。舊石器時代的人類以兩種方式付出了代價來換取大腦的發展。首先，他們花更多時間尋找食物。其次，他們的肌肉萎縮了。就像政府將資金從國防轉移到教育上一樣，人類將能量從肱二頭肌轉移到神經元上。這並非一個在大草原上求生的好策略。黑猩猩無法與智人爭辯，但猿類可以像撕扯布娃娃一樣撕裂人類。

Today our big brains pay off nicely, because we can produce cars and guns that enable us to move much faster than chimps, and shoot them from a safe distance instead of wrestling. But cars and guns are a recent phenomenon. For more than 2 million years, human neural networks kept growing and growing, but apart from some flint knives and pointed sticks, humans had precious little to show for it. What then drove forward the evolution of the massive human brain during those 2 million years? Frankly, we don't know.

Another singular human trait is that we walk upright on two legs. Standing up, it's easier to scan the savannah for game or enemies, and arms that are unnecessary for locomotion are freed for other purposes, like throwing stones or signalling. The more things these hands could do, the more successful their owners were, so evolutionary pressure brought about an increasing concentration of nerves and finely tuned muscles in the palms and fingers. As a result, humans can perform very intricate tasks with their hands. In particular, they can produce and use sophisticated tools. The first evidence

for tool production dates from about 2.5 million years ago, and the manufacture and use of tools are the criteria by which archaeologists recognise ancient humans.

今天，我們的大腦功不可沒，因為我們可以生產汽車和槍支，讓我們移動得比黑猩猩快得多，而且可以在安全的距離之外射擊它們，而不是進行摔跤。但汽車和槍支是一個近期的現象。在超過2百萬年的時間裡，人類神經網絡不斷地增長，但除了一些燧石刀和尖木棍，人類幾乎沒有任何可顯示的東西。那麼，在這2百萬年的演化中，是什麼推動了人類大腦的發展？坦白說，我們不知道。另一個獨特的人類特徵是，我們用兩條腿站立。站起來，可以更容易地掃視大草原上的獵物或敵人，而不必使用用於運動的手臂可以為其他用途，如投擲石頭或發出信號而釋放。手能做的事情越多，它們的主人就會越成功，因此進化壓力帶來了掌心和手指的神經和精密肌肉的不斷集中。因此，人類可以用手進行非常細緻的任務。特別是，他們可以製作和使用複雜的工具。工具製作的第一個證據可以追溯到大約2.5百萬年前，而工具的製造和使用是考古學家認識古人的標準。

Yet walking upright has its downside. The skeleton of our primate ancestors developed for millions of years to support a creature that walked on all fours and had a relatively small head. Adjusting to an upright position was quite a challenge, especially when the scaffolding had to support an extra-large cranium. Humankind paid for its lofty vision and industrious hands with backaches and stiff necks.

Women paid extra. An upright gait required narrower hips, constricting the birth canal – and this just when babies' heads were getting bigger and bigger. Death in childbirth became a major hazard for human females. Women who gave birth earlier, when the infants brain and head were still relatively small and supple, fared better and lived to have more children. Natural selection consequently favoured earlier births. And, indeed, compared to other animals, humans are born prematurely, when many of their vital systems are still under-developed. A colt can trot shortly after birth; a kitten leaves its mother to forage on its own when it is just a few weeks old. Human babies are helpless, dependent for many years on their elders for sustenance, protection and education.

但是直立行走也有其不足之處。我們類靈猴祖先的骨骼形成了數百萬年，以支撐四肢行走且擁有相對較小的頭部的生物。適應直立姿勢是一個相當大的挑戰，特別是當支撐架需要支持一個特別大的頭腦。人類以背痛和僵硬的脖子為代價，來實現了自己莊重的願景和勤勞的雙手。女性付出了更多代價。直立步態需要更窄的臀部，束縛了生產通道，而此時嬰兒的頭部變得越來越大。死於分娩成為人類女性的主要隱患。當嬰兒的頭腦和頭部仍相對較小和柔軟時，分娩較早的女性過得更好，並能生育更多的孩子。因此，自然選擇傾向更早的分娩。事實上，相對於其他動物，人類是早產的，很多重要的系統仍處於發育不完全的狀態。小馬崽出生後不久就能小跑步，幾周大的小貓就離開母親自己覓食。人類嬰兒無助，多年來需要依賴其長輩提供營養、保護和教育。

This fact has contributed greatly both to humankind's extraordinary social abilities and to its unique social problems. Lone mothers could hardly forage enough food for their offspring and themselves with needy children in tow. Raising children required constant help from other family members and neighbours. It takes a tribe to raise a human. Evolution thus favoured those capable of forming strong social ties. In addition, since humans are born underdeveloped, they can be educated and socialised to a far greater extent than any other animal. Most mammals emerge from the womb like glazed earthenware emerging from a kiln – any attempt at remoulding will scratch or break them. Humans emerge from the womb like molten glass from a furnace. They can be spun, stretched and shaped with a surprising degree of freedom. This is why today we can educate our children to become Christian or Buddhist, capitalist or socialist, warlike or peace-loving.

這個事實對人類非凡的社交能力和獨特的社會問題都有極大的貢獻。獨生母親帶著需要幫助的孩子，很難為自己和孩子找齊足夠的食物。養育孩子需要依靠其他家庭成員和鄰居的幫助。養育人類需要整個部落的參與。進化因此傾向於那些能夠建立強烈社會聯繫的人。此外，由於人類出生時是不完全發育的，他們可以接受比其他動物更多的教育和社會化。大多數哺乳動物像從烤爐中取出的釉面陶器一樣出生，任何重新塑形都會抓傷或破壞他們，而人類像從爐子裡液態玻璃一樣出生。他們可以以令人驚訝的程度旋轉、拉伸和塑形。這就是為什麼

今天我們可以教育孩子成為基督徒、佛教徒、資本主義者、社會主義者、好戰者或愛好和平者的原因。

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We assume that a large brain, the use of tools, superior learning abilities and complex social structures are huge advantages. It seems self-evident that these have made humankind the most powerful animal on earth. But humans enjoyed all of these advantages for a full 2 million years during which they remained weak and marginal creatures. Thus humans who lived a million years ago, despite their big brains and sharp stone tools, dwelt in constant fear of predators, rarely hunted large game, and subsisted mainly by gathering plants, scooping up insects, stalking small animals, and eating the carrion left behind by other more powerful carnivores.

One of the most common uses of early stone tools was to crack open bones in order to get to the marrow. Some researchers believe this was our original niche. Just as woodpeckers specialise in extracting insects from the trunks of trees, the first humans specialised in extracting marrow from bones. Why marrow? Well, suppose you observe a pride of lions take down and devour a giraffe. You wait patiently until they're done. But it's still not your turn because first the hyenas and jackals – and you don't dare interfere with them scavenge the leftovers. Only then would you and your band dare approach the carcass, look cautiously left and right – and dig into the edible tissue that remained.

大腦龐大、使用工具、卓越的學習能力和複雜的社會結構被視為巨大的優勢，看起來人類是地球上最有力的動物是不言自明的。但是，在兩百萬年的時間裡，人類享有所有這些優勢，卻仍然是弱小和邊緣化的生物。因此，即使是一百萬年前的人類，擁有大腦和尖銳的石器，仍然時刻擔心受到掠食者的威脅，很少狩獵大型獸類，主要靠採集植物、捕捉小動物和食用其他更強大的肉食動物剩下的腐肉生存。早期石器最普遍的用途之一是破開骨頭以取出骨髓。一些研究人員認為這是我們最初的生態位。就像啄木鳥專門從樹幹中提取昆蟲一樣，最早的人類專門從骨頭中提取骨髓。為什麼是骨髓？嗯，假設你觀察到一群獅子攻擊並吃掉一頭長頸鹿。你耐心等待，直到它們吃完。但現在還不是你的回合，因為鬣狗和狐狸 – 你不敢與它們干涉 – 會先趁機覓

食剩下的食物。只有等這些食腐動物離開後，你和你的同伴才敢接近動物屍體，警惕地左右看著，然後開始挖掘剩下的可食部分。

This is a key to understanding our history and psychology. Genus *Homo* 's position in the food chain was, until quite recently, solidly in the middle. For millions of years, humans hunted smaller creatures and gathered what they could, all the while being hunted by larger predators. It was only 400,000 years ago that several species of man began to hunt large game on a regular basis, and only in the last 100,000 years – with the rise of *Homo sapiens* – that man jumped to the top of the food chain.

That spectacular leap from the middle to the top had enormous consequences. Other animals at the top of the pyramid, such as lions and sharks, evolved into that position very gradually, over millions of years. This enabled the ecosystem to develop checks and balances that prevent lions and sharks from wreaking too much havoc. As lions became deadlier, so gazelles evolved to run faster, hyenas to cooperate better, and rhinoceroses to be more bad-tempered. In contrast, humankind ascended to the top so quickly that the ecosystem was not given time to adjust. Moreover, humans themselves failed to adjust. Most top predators of the planet are majestic creatures. Millions of years of dominion have filled them with self-confidence. Sapiens by contrast is more like a banana republic dictator. Having so recently been one of the underdogs of the savannah, we are full of fears and anxieties over our position, which makes us doubly cruel and dangerous. Many historical calamities, from deadly wars to ecological catastrophes, have resulted from this over-hasty jump.

這是了解我們歷史和心理的關鍵。人屬於食物鏈中間的位置，在很長一段時間內，人類狩獵小動物、收集所能收集的東西，同時也受到更大的掠食者的獵殺。直到大約 40 萬年前，幾種人類開始定期狩獵大型獵物，而真正讓人類成為食物鏈頂端的是在最近 10 萬年內，隨著智人的出現。從中間到頂端的那次壯觀飛躍帶來了巨大的後果。食物鏈頂端的其他動物，如獅子和鯊魚，是逐漸進化到這個位置的，經過了數百萬年，這使得生態系統能夠發展出檢查和平衡，以避免獅子和鯊魚造成過多的破壞。而人類卻快速地從中間跳到了頂端，這使得生態系統沒有時間去適應這樣的變化。此外，人類本身也未能適應。地球上的大多數頂級掠食者都是威嚴的生物。數百萬年的統治使它們充滿自

信。而智人卻更像一個香蕉共和國的獨裁者。剛才還是草原上的弱者之一，現在我們充滿了對自己地位的恐懼和焦慮，這使我們變得格外殘忍和危險。許多歷史上的災難，從致命的戰爭到生態災難，都是由於這種過快的跳躍所導致的。

A Race of Cooks

A significant step on the way to the top was the domestication of fire. Some human species may have made occasional use of fire as early as 800,000 years ago. By about 300,000 years ago, *Homo erectus*, Neanderthals and the forefathers of *Homo sapiens* were using fire on a daily basis. Humans now had a dependable source of light and warmth, and a deadly weapon against prowling lions. Not long afterwards, humans may even have started deliberately to torch their neighbourhoods. A carefully managed fire could turn impassable barren thickets into prime grasslands teeming with game. In addition, once the fire died down, Stone Age entrepreneurs could walk through the smoking remains and harvest charcoaled animals, nuts and tubers.

But the best thing fire did was cook. Foods that humans cannot digest in their natural forms – such as wheat, rice and potatoes – became staples of our diet thanks to cooking. Fire not only changed food's chemistry, it changed its biology as well. Cooking killed germs and parasites that infested food. Humans also had a far easier time chewing and digesting old favourites such as fruits, nuts, insects and carrion if they were cooked. Whereas chimpanzees spend five hours a day chewing raw food, a single hour suffices for people eating cooked food.

通往頂峰的一個重要一步是馴化火焰。有些人類物種可能在800,000年前就偶爾使用火焰。大約在300,000年前，直立人、尼安德特人和智人的祖先每天都使用火焰。人類現在擁有可靠的光源和溫暖，以及對抗徘徊的獅子的致命武器。不久之後，人類甚至可能開始有意縱火他們的社區。精心管理的火災可以將難以通行的荒蕪灌木叢變成充滿遊戲的優質牧場。此外，一旦火焰熄滅，史前企業家就可以走過煙熏的遺跡，收穫木炭動物、堅果和塊莖等食物。但火焰最棒的是烹飪。火焰讓人類無法自然消化的食品（如小麥、米和馬鈴薯）成為我們飲食的主食。烹飪不僅改變了食物的化學成分，也改變了它的生物學。烹飪

殺死了滋生於食物中的病菌和寄生蟲。如果水果、堅果、昆蟲和腐肉被烹飪，人類也可以更輕鬆地咀嚼和消化它們的老朋友。而黑猩猩需要五個小時來咀嚼生食，人們吃熟食只需要一個小時。

The advent of cooking enabled humans to eat more kinds of food, to devote less time to eating, and to make do with smaller teeth and shorter intestines. Some scholars believe there is a direct link between the advent of cooking, the shortening of the human intestinal track, and the growth of the human brain. Since long intestines and large brains are both massive energy consumers, it's hard to have both. By shortening the intestines and decreasing their energy consumption, cooking inadvertently opened the way to the jumbo brains of Neanderthals and Sapiens. ¹

Fire also opened the first significant gulf between man and the other animals. The power of almost all animals depends on their bodies: the strength of their muscles, the size of their teeth, the breadth of their wings. Though they may harness winds and currents, they are unable to control these natural forces, and are always constrained by their physical design. Eagles, for example, identify thermal columns rising from the ground, spread their giant wings and allow the hot air to lift them upwards. Yet eagles cannot control the location of the columns, and their maximum carrying capacity is strictly proportional to their wingspan.

烹飪的出現使人類能夠享用更多種類的食物，花費更少時間進食，並且減小了牙齒和腸道的長度。一些學者相信，烹飪的興起、人類腸道的縮短和人類大腦的增長之間存在直接關聯。由於長腸道和大腦都是巨大的能量消耗者，兩者很難兼得。通過縮短腸道並減少其能量消耗，烹飪無意中為尼安德特人和智人的大腦擴展鋪平了道路。火也開啟了人與其他動物之間的第一個顯著差距。幾乎所有動物的力量都取決於它們的身體：肌肉的強度，牙齒的大小和翅膀的寬度。儘管它們可能利用風和水流，但它們無法控制這些自然力量，並且始終受到其身體結構的限制。例如，鷹會識別從地面上升的熱空氣柱，展開巨大的翅膀讓熱空氣將其升高。然而，老鷹無法控制空氣柱的位置，並且它們的最大運載能力嚴格比例於翼展。

When humans domesticated fire, they gained control of an obedient and potentially limitless force. Unlike eagles, humans could choose when and

where to ignite a flame, and they were able to exploit fire for any number of tasks. Most importantly, the power of fire was not limited by the form, structure or strength of the human body. A single woman with a flint or fire stick could burn down an entire forest in a matter of hours. The domestication of fire was a sign of things to come.

Our Brothers' Keepers

Despite the benefits of fire, 150,000 years ago humans were still marginal creatures. They could now scare away lions, warm themselves during cold nights, and burn down the occasional forest. Yet counting all species together, there were still no more than perhaps a million humans living between the Indonesian archipelago and the Iberian peninsula, a mere blip on the ecological radar.

人類馴化火，便擁有了一股可以依從且潛力無限的力量。與鷹不同，人類可以選擇何時何處點燃火焰，並能利用火焰完成各種任務。最重要的是，火的能量不受人體的形態、結構或力量所限制。一個女人憑著一根燧石或火柴，可以在幾小時內燒下整片森林。馴化火是未來的徵兆。盡管火的好處，150,000年前的人類仍然是邊緣角色。他們現在可以趕跑獅子，在寒夜中取暖，偶爾燒掉森林。然而，在將所有物種計算在內後，在印尼群島和伊比利亞半島之間生活的人類總共還不到一百萬人，僅是生態雷達上的微小光點。

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.

我們的物種——智人已經登上了世界舞臺，但到目前為止，他們只是在非洲的一個角落裡自己照料自己。我們不確定哪裡、什麼時候可以將被歸類為智人的動物從早期的人類演化出來，但大多數科學家都同意，大約在15萬年前，東非被長相和我們一模一樣的智人居住。如果其中一個人現在出現在現代的太平間，當地的病理學家不會發現任何不尋常的事情。由於火的恩惠，他們的牙齒和下頷比祖先小，但大腦與我們的一樣大。科學家們還同意，在大約7萬年前，來自東非的智人向阿拉伯半島擴散，從那裡，他們迅速佔領了整個歐亞大陸。

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.

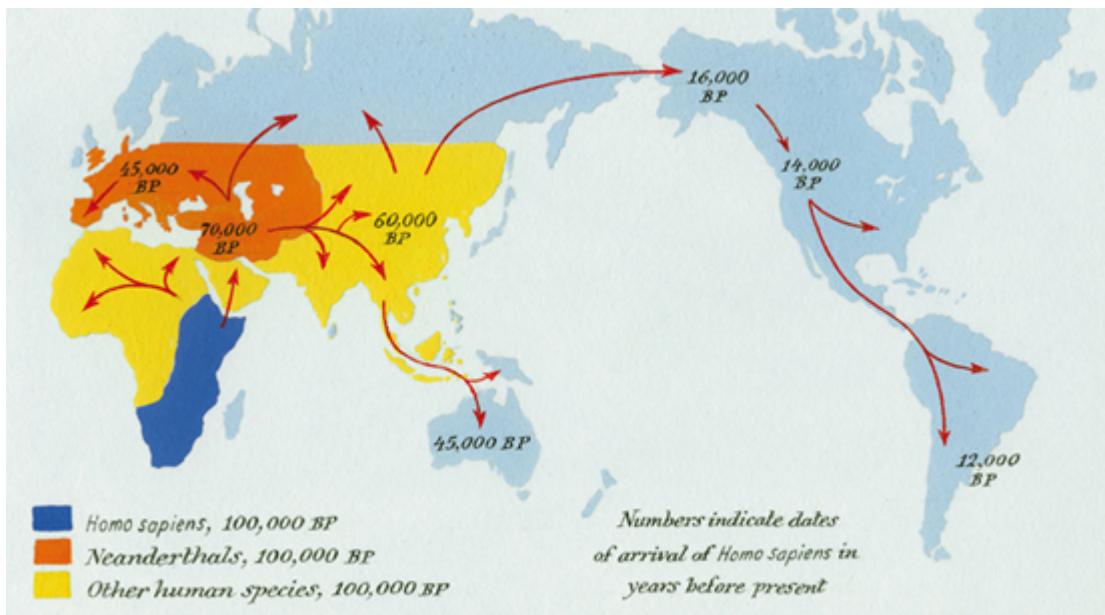
For example, when Sapiens reached the Middle East and Europe, they encountered the Neanderthals. These humans were more muscular than Sapiens, had larger brains, and were better adapted to cold climates. They used tools and fire, were good hunters, and apparently took care of their sick and infirm. (Archaeologists 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.

當智人登陸阿拉伯時，歐亞大陸大部分已經被其他人類定居。他們發生了什麼事？有兩種相互衝突的理論。『雜交理論』講述了一個吸引、性和交融的故事。當非洲移民在世界各地傳播時，他們與其他人類族群進行了雜交，如今的人就是這種雜交的結果。例如，當智人抵達中東和歐洲時，他們遇到了尼安德特人。這些人比智人更強壯，腦部更大，更適應寒冷氣候。他們使用工具和火，是優秀的獵人，顯然也照顧過他們的病人和病患。（考古學家發現了許多長年與嚴重身體殘疾共存的尼安德特人的遺骸，這證明他們得到了親戚的照顧。）尼安德特人通常被描繪成典型的蠻橫愚蠢的『穴居人』，但最近的證據改變了他們的形象。

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.

The opposing view, called the 'Replacement Theory' tells a very different story – one of incompatibility, revulsion, and perhaps even genocide. According to this theory, Sapiens and other humans had different anatomies, and most likely different mating habits and even body odours. They would have had little sexual interest in one another. And even if a Neanderthal Romeo and a Sapiens Juliet fell in love, they could not produce fertile children, because the genetic gulf separating the two populations was already unbridgeable. The two populations remained completely distinct, and when the Neanderthals died out, or were killed off, their genes died with them. According to this view, Sapiens replaced all the previous human populations without merging with them. If that is the case, the lineages of all contemporary humans can be traced back, exclusively, to East Africa, 70,000 years ago. We are all 'pure Sapiens'.

根據「異種交配理論」，當智人進入尼安德特人的領土時，智人與尼安德特人進行繁衍，直到兩個族群融合。如果這是事實，那麼今天的歐亞人並非純粹的智人。他們是智人和尼安德特人的混合體。同樣地，當智人到達東亞時，他們與當地的直立人進行了異種交配，因此中國人和韓國人是智人和直立人的混合體。相反的觀點被稱為「替代理論」，講述的是一個完全不同的故事，關於不相容、反感，甚至可能是種族滅絕。根據這個理論，智人和其他人類有不同的解剖結構，很可能有不同的交配習慣甚至體味。他們對對方的性興趣很小。即使一個尼安德特的羅密歐和一個智人的茱麗葉墜入愛河，他們也不能生育。因為兩個族群之間存在不可逾越的基因鴻溝。這兩個族群保持完全獨立，當尼安德特人滅絕或被殺害時，他們的基因也隨之而逝。因此，根據這個觀點，智人在不與其他族群混合的情況下取代了所有以前的人類族群。如果是這樣，所有現代人類的家族譜都只能追溯到70,000年前的東非。我們全部都是「純智人」。



Map 1 . *Homo sapiens* conquers the globe .

A lot hinges on this debate. From an evolutionary perspective, 70,000 years is a relatively short interval. If the Replacement Theory is correct, all living humans have roughly the same genetic baggage, and racial distinctions among them are negligible. But if the Interbreeding Theory is right, there might well be genetic differences between Africans, Europeans and Asians that go back hundreds of thousands of years. This is political dynamite, which could provide material for explosive racial theories.

In recent decades the Replacement Theory has been the common wisdom in the field. It had firmer archaeological backing, and was more politically correct (scientists had no desire to open up the Pandora's box of racism by claiming significant genetic diversity among modern human populations). But that ended in 2010, when the results of a four-year effort to map the Neanderthal genome were published. Geneticists were able to collect enough intact Neanderthal DNA from fossils to make a broad comparison between it and the DNA of contemporary humans. The results stunned the scientific community.

地圖1。智人征服全球。這場辯論有很大的關鍵性。從進化的角度來看，7萬年是一個相對短暫的時間間隔。如果替換理論是正確的，所有現代人都有大致相同的基因包袱，種族差異可以忽略不計。但如果交

配理論是正確的，那麼非洲人、歐洲人和亞洲人之間可能存在數十萬年的基因差異。這是政治上的火藥，可能為爆炸性的種族理論提供素材。近幾十年來，替換理論一直是該領域的共識。它有較堅實的考古學背景，也更為政治正確（科學家們不希望聲稱現代人類族群之間存在重大的遺傳多樣性，因為那會打開種族歧視的潘多拉盒子）。但這一切在2010年結束了，當時四年的努力結果顯示了尼安德特人的基因組。基因學家們能從化石中收集到足夠完整的尼安德特人DNA，與現代人的DNA進行廣泛比較。結果讓科學界震驚。

It turned out that 1–4 per cent of the unique human DNA of modern populations in the Middle East and Europe is Neanderthal DNA. That's not a huge amount, but it's significant. A second shock came several months later, when DNA extracted from the fossilised finger from Denisova was mapped. The results proved that up to 6 per cent of the unique human DNA of modern Melanesians and Aboriginal Australians is Denisovan DNA.

If these results are valid – and it's important to keep in mind that further research is under way and may either reinforce or modify these conclusions – the Interbreeders got at least some things right. But that doesn't mean that the Replacement Theory is completely wrong. Since Neanderthals and Denisovans contributed only a small amount of DNA to our present-day genome, it is impossible to speak of a 'merger' between Sapiens and other human species. Although differences between them were not large enough to completely prevent fertile intercourse, they were sufficient to make such contacts very rare.

現代中東和歐洲人類獨特DNA的1-4%是尼安德特人的DNA。這不是很多，但仍然很重要。幾個月後，來自Denisova的化石手指提取的DNA被映射，結果證明現代美拉尼西亞人和澳大利亞原住民獨特人類DNA中多達6%是Denisovan DNA。如果這些結果是正確的 - 需要謹慎考慮進一步的研究可能會加強或修改這些結論 - 交配說可能是對的。但這並不意味著替換理論完全錯誤。由於尼安德特人和Denisovans只對我們現今基因組的DNA做出了一小部分貢獻，因此不可能談論Sapiens和其他人類物種之間的“合併”。儘管它們之間的差異不足以完全防止繁殖行為，但足以使此類接觸非常罕見。

How then should we understand the biological relatedness of Sapiens, Neanderthals and Denisovans? Clearly, they were not completely different species like horses and donkeys. On the other hand, they were not just different populations of the same species, like bulldogs and spaniels. Biological reality is not black and white. There are also important grey areas. Every two species that evolved from a common ancestor, such as horses and donkeys, were at one time just two populations of the same species, like bulldogs and spaniels. There must have been a point when the two populations were already quite different from one another, but still capable on rare occasions of having sex and producing fertile offspring. Then another mutation severed this last connecting thread, and they went their separate evolutionary ways.

人類、尼安德特人和丹尼索瓦人的生物相關性我們應如何理解呢？顯然，它們不像馬和驢一樣完全是不同的物種。另一方面，它們也不僅僅是同一物種的不同族群，就像牛頭犬和西班牙獵犬。生物現實並不是非黑即白的。還有一些重要的灰色地帶。每當有兩個從同一祖先進化而來的物種，例如馬和驢，它們曾經只是同一物種的兩個族群，就像牛頭犬和西班牙獵犬一樣。肯定存在一個時刻，當這兩個族群已經相當不同，但仍然能偶爾進行交配並繁殖出可育的後代。然後另一個突變斷開了最後的聯繫，它們走向了各自的進化道路。

It seems that about 50,000 years ago, Sapiens, Neanderthals and Denisovans were at that borderline point. They were almost, but not quite, entirely separate species. As we shall see in the next chapter, Sapiens were already very different from Neanderthals and Denisovans not only in their genetic code and physical traits, but also in their cognitive and social abilities, yet it appears it was still just possible, on rare occasions, for a Sapiens and a Neanderthal to produce a fertile offspring. So the populations did not merge, but a few lucky Neanderthal genes did hitch a ride on the Sapiens Express. It is unsettling – and perhaps thrilling – to think that we Sapiens could at one time have sex with an animal from a different species, and produce children together.

約五萬年前，智人、尼安德特人和丹尼索瓦人似乎處於邊緣狀態，他們幾乎是獨立的物種，但又不完全分離。正如我們在下一章中將看到的那樣，智人在基因和身體特徵、認知和社交能力等方面已經與尼安

德特人和丹尼索瓦人有了很大的不同，但在極少數情況下，智人和尼安德特人仍然有可能產生可育的後代。因此，這些族群沒有融合在一起，但一些幸運的尼安德特基因確實乘上了智人的列車。令人不安，但也令人興奮的是，我們智人曾經有可能與不同物種的動物發生性行為，一起生孩子。



3. A speculative reconstruction of a Neanderthal child. Genetic evidence hints that at least some Neanderthals may have had fair skin and hair .

But if the Neanderthals, Denisovans and other human species didn't merge with Sapiens, why did they vanish? One possibility is that *Homo sapiens* drove them to extinction. Imagine a Sapiens band reaching a Balkan valley where Neanderthals had lived for hundreds of thousands of years. The newcomers began to hunt the deer and gather the nuts and berries that were the Neanderthals' traditional staples. Sapiens were more proficient hunters and gatherers – thanks to better technology and superior social skills – so they multiplied and spread. The less resourceful Neanderthals found it increasingly difficult to feed themselves. Their population dwindled and they slowly died out, except perhaps for one or two members who joined their Sapiens neighbours.

3. 對尼安德特兒童的假想重建。基因證據表明，至少一些尼安德特人可能有著淺色的皮膚和頭髮。但如果尼安德特人、丹尼索瓦人和其他

人類物種沒有和智人融合，那麼他們為什麼會消失呢？一種可能是智人驅使他們滅絕。想象一下一支智人小隊到達了一個尼安德特人已經生活了數十萬年的巴爾幹山谷。新來的人開始狩獵鹿和採摘堅果和漿果，這是尼安德特人傳統的主食。由於技術更好和更優秀的社交技能，智人的狩獵和採集技能更加熟練，所以他們繁殖並擴散。資源較少的尼安德特人發現越來越難以為自己餵養。他們的人口減少，最終淡出人群，除了可能有一兩個成員加入了他們的智人鄰居。

Another possibility is that competition for resources flared up into violence and genocide. Tolerance is not a Sapiens trademark. In modern times, a small difference in skin colour, dialect or religion has been enough to prompt one group of Sapiens to set about exterminating another group. Would ancient Sapiens have been more tolerant towards an entirely different human species? It may well be that when Sapiens encountered Neanderthals, the result was the first and most significant ethnic-cleansing campaign in history.

Whichever way it happened, the Neanderthals (and the other human species) pose one of history's great what ifs. Imagine how things might have turned out had the Neanderthals or Denisovans survived alongside *Homo sapiens*. What kind of cultures, societies and political structures would have emerged in a world where several different human species coexisted? How, for example, would religious faiths have unfolded? Would the book of Genesis have declared that Neanderthals descend from Adam and Eve, would Jesus have died for the sins of the Denisovans, and would the Qur'an have reserved seats in heaven for all righteous humans, whatever their species? Would Neanderthals have been able to serve in the Roman legions, or in the sprawling bureaucracy of imperial China? Would the American Declaration of Independence hold as a self-evident truth that all members of the genus *Homo* are created equal? Would Karl Marx have urged workers of all species to unite?

另一個可能性是資源競爭升級至暴力和種族滅絕。容忍並非智人的商標。在現代，膚色、方言或宗教信仰的微小差異已足以促使一群智人開始消滅另一個群體。古代的智人是否會對完全不同的人類物種更加寬容？當智人遇到尼安德特人時，結果可能是人類史上第一個也是最重要的種族清洗運動。無論以何種方式發生，尼安德特人（和其他人類物種）都提出了人類歷史中最大的疑問之一。想象一下，如果尼安

德特人或丹尼索瓦人與智人共存，事情可能會發展成什麼樣子。在多個不同的人類物種共存的世界中，會出現什麼樣的文化、社會和政治結構？例如，宗教信仰會如何展開？創世紀是否會宣稱尼安德特人是亞當和夏娃的後代？耶穌是否會因丹尼索瓦人的罪而死？古蘭經是否會為所有義人（無論種類）預留天堂座位？尼安德特人是否能夠服役於羅馬軍團或中國大規模的官僚機構？美國獨立宣言是否會將屬於人類物種的所有成員創造平等作為不證自明的真理？馬克思是否會敦促各物種的工人團結起來？

Over the past 10,000 years, *Homo sapiens* has grown so accustomed to being the only human species that it's hard for us to conceive of any other possibility. Our lack of brothers and sisters makes it easier to imagine that we are the epitome of creation, and that a chasm separates us from the rest of the animal kingdom. When Charles Darwin indicated that *Homo sapiens* was just another kind of animal, people were outraged. Even today many refuse to believe it. Had the Neanderthals survived, would we still imagine ourselves to be a creature apart? Perhaps this is exactly why our ancestors wiped out the Neanderthals. They were too familiar to ignore, but too different to tolerate.

Whether Sapiens are to blame or not, no sooner had they arrived at a new location than the native population became extinct. The last remains of *Homo soloensis* are dated to about 50,000 years ago. *Homo denisova* disappeared shortly thereafter. Neanderthals made their exit roughly 30,000 years ago. The last dwarf-like humans vanished from Flores Island about 12,000 years ago. They left behind some bones, stone tools, a few genes in our DNA and a lot of unanswered questions. They also left behind us, *Homo sapiens*, the last human species.

在過去的一萬年中，智人已經習慣成為唯一的人類物種，因此我們很難想像其他可能性。缺乏兄弟姐妹使我們更容易想像我們是創造的終極體，且帶著與其他動物王國隔閡的感覺。查爾斯·達爾文指出智人只是另一種動物時，人們感到震驚。即使今天，很多人仍然不相信。如果尼安德特人倖存下來，我們會不會認為自己是一個不同的生物呢？也許這正是為什麼我們的祖先滅絕了尼安德特人。他們太值得關注，但又太不同，因此無法容忍。無論智人是否應該負責，他們到達新地點後，原住民很快就滅絕了。獨居智人的遺骸最後出現在約五萬年

前。丹尼索瓦人不久後消失了。尼安德特人大約三萬年前退出了舞臺。矮小人類最後消失於約一萬二千年前的弗洛雷斯島。他們留下了一些骨頭、石器、我們DNA中的一些基因和很多未解答的問題。他們也留下了我們——智人，最後一個人類物種。

What was the Sapiens' secret of success? How did we manage to settle so rapidly in so many distant and ecologically different habitats? How did we push all other human species into oblivion? Why couldn't even the strong, brainy, cold-proof Neanderthals survive our onslaught? The debate continues to rage. The most likely answer is the very thing that makes the debate possible: *Homo sapiens* conquered the world thanks above all to its unique language.

人類智慧的成功秘密是什麼？我們是如何在許多不同的遠程及生態環境中快速定居的？我們為什麼要把其他人類物種推向遺忘的深淵？為什麼連強健、聰明、能耐寒的尼安德特人也無法抵擋我們的攻擊？爭論不斷。最可能的答案是，讓這場辯論成為可能的原因：智人拥有独特的语言，正是因为这个我们才能征服世界。

2

The Tree of Knowledge

IN THE PREVIOUS CHAPTER WE SAW THAT although Sapiens had already populated East Africa 150,000 years ago, they began to overrun the rest of planet Earth and drive the other human species to extinction only about 70,000 years ago. In the intervening millennia, even though these archaic Sapiens looked just like us and their brains were as big as ours, they did not enjoy any marked advantage over other human species, did not produce particularly sophisticated tools, and did not accomplish any other special feats.

In fact, in the first recorded encounter between Sapiens and Neanderthals, the Neanderthals won. About 100,000 years ago, some Sapiens groups migrated north to the Levant, which was Neanderthal territory, but failed to secure a firm footing. It might have been due to nasty natives, an inclement climate, or unfamiliar local parasites. Whatever the reason, the Sapiens eventually retreated, leaving the Neanderthals as masters of the Middle East.

上一章節中我們看到，雖然智人在150,000年前已經在東非居住，但他們始於約70,000年前開始征服地球上其他的人類物種並推至滅絕。在這段時間裡，即使古老的智人和我們長得一樣，腦袋也和我們一樣聰明，但他們並沒有比其他人類物種擁有更突出的優勢，並且未能生產出特別複雜的工具或完成任何其他特殊的成就。事實上，在智人和尼安德特人的第一次記錄相遇中，尼安德特人獲勝了。約100,000年前，一些智人族群向北遷徙到了尼安德特人的領土——黎凡特，但未能獲得穩定的立足點。這可能是由於當地惡劣的環境、不友好的當地人，或者不熟悉的當地寄生蟲所致。不管原因是什麼，最終智人撤退了，讓尼安德特人成為了中東地區的主宰。

This poor record of achievement has led scholars to speculate that the internal structure of the brains of these Sapiens was probably different from

ours. They looked like us, but their cognitive abilities – learning, remembering, communicating – were far more limited. Teaching such an ancient Sapiens English, persuading him of the truth of Christian dogma, or getting him to understand the theory of evolution would probably have been hopeless undertakings. Conversely, we would have had a very hard time learning his language and understanding his way of thinking.

But then, beginning about 70,000 years ago, *Homo sapiens* started doing very special things. Around that date Sapiens bands left Africa for a second time. This time they drove the Neanderthals and all other human species not only from the Middle East, but from the face of the earth. Within a remarkably short period, Sapiens reached Europe and East Asia. About 45,000 years ago, they somehow crossed the open sea and landed in Australia – a continent hitherto untouched by humans. The period from about 70,000 years ago to about 30,000 years ago witnessed the invention of boats, oil lamps, bows and arrows and needles (essential for sewing warm clothing). The first objects that can reliably be called art date from this era (see the Stadel lion-man on [this page](#)), as does the first clear evidence for religion, commerce and social stratification.

這種成就的貧弱紀錄已讓學者們推測這些智人的大腦內部結構可能和我們不同。他們看起來如同我們，但認知能力——學習、記憶、溝通——卻受到極大限制。教授這種古老的智人英語、說服他信教理、或讓他了解演化論可能都是徒勞無功的。相反，我們學習他的語言和理解他的思維方式也可能都非常困難。但在約七萬年前，智人開始做一些非常特別的事情。在那一年左右，智人族群第二次離開非洲，並把尼安德特人和其他人類物種從中東和整個地球上驅逐走。在短短的時間內，智人就到達了歐洲和東亞。約四萬五千年前，他們以某種方式渡過海洋來到澳洲——一個此前未被人類觸及的大陸。約從七萬年前到三萬年前的時期見證了船隻、石油燈、弓箭和針（縫制保暖服裝所需的必要物品）的發明。可以可靠稱之為藝術品的第一批物品以及宗教、商業和社會分層的第一個清晰證據都來源於此時期（見本頁的 Stadel 獅人）。

Most researchers believe that these unprecedented accomplishments were the product of a revolution in Sapiens' cognitive abilities. They maintain that the people who drove the Neanderthals to extinction, settled Australia, and

carved the Stadel lion-man were as intelligent, creative and sensitive as we are. If we were to come across the artists of the Stadel Cave, we could learn their language and they ours. We'd be able to explain to them everything we know – from the adventures of Alice in Wonderland to the paradoxes of quantum physics – and they could teach us how their people view the world.

The appearance of new ways of thinking and communicating, between 70,000 and 30,000 years ago, constitutes the Cognitive Revolution. What caused it? We're not sure. The most commonly believed theory argues that accidental genetic mutations changed the inner wiring of the brains of Sapiens, enabling them to think in unprecedented ways and to communicate using an altogether new type of language. We might call it the Tree of Knowledge mutation. Why did it occur in Sapiens DNA rather than in that of Neanderthals? It was a matter of pure chance, as far as we can tell. But it's more important to understand the consequences of the Tree of Knowledge mutation than its causes. What was so special about the new Sapiens language that it enabled us to conquer the world? ^{*}

大多數研究人員認為這些前所未有的成就是智人認知能力革命的產物。他們認為，驅逐了尼安德特人，定居於澳大利亞，並雕刻斯塔德爾獅人的人們和我們一樣聰明、有創意和敏感。如果我們遇到斯塔德爾洞穴的藝術家，我們可以學習他們的語言，他們也能學習我們的。我們能向他們解釋我們所知道的所有事情-從愛麗絲漫遊奇境記到量子物理學悖論-他們也可以教我們他們的人民如何看待世界。7萬到3萬年前出現的新思維和交流方式對於人類革命至關重要。是什麼導致了這種革命？我們不確定。最普遍的理論認為，偶然的基因突變改變了智人的大腦內部結構，使他們能以前所未有的方式思考並使用全新類型的語言進行交流。我們可以稱之為知識之樹突變。為什麼它發生在智人的DNA中而不是尼安德特人的DNA中？據我們所知，這是純粹的機遇問題。但重要的是要理解知識之樹突變的後果而不是原因。新智人語言有何特殊之處，使我們能征服世界？

It was not the first language. Every animal has some kind of language. Even insects, such as bees and ants, know how to communicate in sophisticated ways, informing one another of the whereabouts of food. Neither was it the first vocal language. Many animals, including all ape and monkey species, have vocal languages. For example, green monkeys use calls of various kinds

to communicate. Zoologists have identified one call that means, ‘Careful! An eagle!’ A slightly different call warns, ‘Careful! A lion!’ When researchers played a recording of the first call to a group of monkeys, the monkeys stopped what they were doing and looked upwards in fear. When the same group heard a recording of the second call, the lion warning, they quickly scrambled up a tree. Sapiens can produce many more distinct sounds than green monkeys, but whales and elephants have equally impressive abilities. A parrot can say anything Albert Einstein could say, as well as mimicking the sounds of phones ringing, doors slamming and sirens wailing. Whatever advantage Einstein had over a parrot, it wasn’t vocal. What, then, is so special about our language?

這不是第一種語言。每種動物都有某種形式的語言。即使是昆蟲，如蜜蜂和螞蟻，也知道如何以複雜的方式進行交流，彼此通報食物的下落。這也不是第一種聲音語言。包括所有靈長類和猴子在內的許多動物都有聲音語言。例如，綠猴使用各種叫聲進行交流。動物學家確定了一種叫聲的含義，“小心！一隻雄鷹！”稍微不同的叫聲警告，“小心！一頭獅子！”當研究人員向一組猴子播放第一種叫聲的錄音時，猴子停止了正在做的事情，害怕地向上看。當同一組聽到第二種叫聲，即獅子警告的錄音時，它們迅速地爬上了樹。智人可以發出比綠猴更多的不同聲音，但是鯨魚和大象也具有同樣令人印象深刻的能力。鸚鵡可以說出阿爾伯特·愛因斯坦說過的任何事情，並且能夠模仿電話響鈴，門嘭嘭作響和警笛聲的聲音。那我們的語言有什麼特別之處呢？

The most common answer is that our language is amazingly supple. We can connect a limited number of sounds and signs to produce an infinite number of sentences, each with a distinct meaning. We can thereby ingest, store and communicate a prodigious amount of information about the surrounding world. A green monkey can yell to its comrades, ‘Careful! A lion!’ But a modern human can tell her friends that this morning, near the bend in the river, she saw a lion tracking a herd of bison. She can then describe the exact location, including the different paths leading to the area. With this information, the members of her band can put their heads together and discuss whether they ought to approach the river in order to chase away the lion and hunt the bison.

A second theory agrees that our unique language evolved as a means of sharing information about the world. But the most important information that needed to be conveyed was about humans, not about lions and bison. Our language evolved as a way of gossiping. According to this theory *Homo sapiens* is primarily a social animal. Social cooperation is our key for survival and reproduction. It is not enough for individual men and women to know the whereabouts of lions and bison. It's much more important for them to know who in their band hates whom, who is sleeping with whom, who is honest, and who is a cheat.

最常見的答案是，我們的語言非常靈活。我們可以用有限的音和符號來產生無限數量的句子，每句都有不同的意義。因此，我們可以攝取、存儲和傳達大量有關周圍世界的信息。一只綠色的猴子可以對它的同伴大喊：“小心！有獅子！”但現代人可以告訴她的朋友，在河流彎曲處，她今天早上看到一頭獅子正在追蹤一群野牛。然後她可以描述出確切的位置，包括通向該區域的不同路徑。有了這個信息，她的小組成員可以集思廣益，討論是否應該接近河流，以驅趕獅子和狩獵野牛。第二個理論認為，我們獨特的語言進化是共享有關世界的信息的一種手段。但最重要的信息需要傳達的是關於人類，而不是關於獅子和野牛。我們的語言進化成為一種閒聊的方式。根據這個理論，智人首先是一種社會動物。社會合作是我們生存和繁殖的關鍵。單個男人和女人知道獅子和野牛的下落是不夠的。對他們來說，更重要的是誰討厭誰，誰和誰睡覺，誰是誠實的，誰是騙子。



4. An ivory figurine of a ‘lion-man’ (or ‘lioness-woman’) from the Stadel Cave in Germany (c.32,000 years ago). The body is human, but the head is leonine. This is one of the first indisputable examples of art, and probably of religion, and of the ability of the human mind to imagine things that do not really exist .

The amount of information that one must obtain and store in order to track the ever-changing relationships of a few dozen individuals is staggering. (In a band of fifty individuals, there are 1,225 one-on-one relationships, and countless more complex social combinations.) All apes show a keen interest

in such social information, but they have trouble gossiping effectively. Neanderthals and archaic *Homo sapiens* probably also had a hard time talking behind each other's backs – a much maligned ability which is in fact essential for cooperation in large numbers. The new linguistic skills that modern Sapiens acquired about seventy millennia ago enabled them to gossip for hours on end. Reliable information about who could be trusted meant that small bands could expand into larger bands, and Sapiens could develop tighter and more sophisticated types of cooperation.¹

4. 來自德國Stadel洞穴（約32,000年前）的一尊象牙雕像，描繪一個“獅人”（或“母獅女”）。身體是人類的，但頭部是獅子的。這是藝術和宗教的首批確凿例證，也是人類頭腦想像不存在的事物的能力。要追蹤幾十個人物之間不斷變化的關係，必須獲取和存儲龐大的信息量。（在50個人的團隊中，有1,225種一對一的關係，以及無數更複雜的社會組合。）所有的人類猿都對這樣的社交信息感興趣，但他們很難有效地閒聊。尼安德特人和早期的現代人可能也難以背著對方說話 - 這實際上是合作所必需的一種被誤解的能力。現代人大約70,000年前獲得的新語言技能使他們可以閒聊數小時。可靠的關於誰可信的信息意味著小團隊可以擴展成大團隊，人類可以發展更緊密和更複雜的合作方式。1

The gossip theory might sound like a joke, but numerous studies support it. Even today the vast majority of human communication – whether in the form of emails, phone calls or newspaper columns – is gossip. It comes so naturally to us that it seems as if our language evolved for this very purpose. Do you think that history professors chat about the reasons for World War One when they meet for lunch, or that nuclear physicists spend their coffee breaks at scientific conferences talking about quarks? Sometimes. But more often, they gossip about the professor who caught her husband cheating, or the quarrel between the head of the department and the dean, or the rumours that a colleague used his research funds to buy a Lexus. Gossip usually focuses on wrongdoings. Rumour-mongers are the original fourth estate, journalists who inform society about and thus protect it from cheats and freeloaders.

八卦理論聽起來像是個玩笑，但許多研究支持它。即使是今天，人類的大多數溝通方式，無論是電子郵件、電話還是報紙，都是八卦。這

種溝通形式對我們來說是如此自然，以至於我們的語言似乎就是為這一目的而演化而來的。你是否認為歷史學教授在午餐時會聊到一戰的原因，或者核物理學家在科學會議的咖啡休息時間裡會談論夸克？有時候是會的。但更常見的是，他們會八卦某位教授發現她的丈夫出軌了，或者系主任和院長之間的爭吵，或者同事用他的研究資金買了一輛雷克萊斯的謠言。八卦通常聚焦於不當行為。謠言製造者是最早的第四權，是告訴社會有關騙子和搭便車者，進而保護社會的記者們。

Most likely, both the gossip theory and the there-is-a-lion-near-the-river theory are valid. Yet the truly unique feature of our language is not its ability to transmit information about men and lions. Rather, it's the ability to transmit information about things that do not exist at all. As far as we know, only Sapiens can talk about entire kinds of entities that they have never seen, touched or smelled.

Legends, myths, gods and religions appeared for the first time with the Cognitive Revolution. Many animals and human species could previously say, 'Careful! A lion!' Thanks to the Cognitive Revolution, *Homo sapiens* acquired the ability to say, 'The lion is the guardian spirit of our tribe.' This ability to speak about fictions is the most unique feature of Sapiens language.

很有可能，流言蜚语理论和在河边附近有狮子的理论都是有效的。然而，我们语言真正独特的特征不在于它传递关于人和狮子的信息的能力。相反，它在于传递关于根本不存在的事物的信息的能力。据我们所知，只有智人才能谈论他们从未见过、摸过或闻到的整个实体类别。传说、神话、神灵和宗教是认知革命时首次出现的。许多动物和人类物种以前可以说：“小心！有狮子！”由于认知革命，*Homo sapiens* 获得了说：“狮子是我们部落的守护神。”的能力。谈论虚构事物的能力是智人语言最独特的特征。

It's relatively easy to agree that only *Homo sapiens* can speak about things that don't really exist, and believe six impossible things before breakfast. You could never convince a monkey to give you a banana by promising him limitless bananas after death in monkey heaven. But why is it important? After all, fiction can be dangerously misleading or distracting. People who go to the forest looking for fairies and unicorns would seem to have less chance of survival than people who go looking for mushrooms and deer. And

if you spend hours praying to non-existing guardian spirits, aren't you wasting precious time, time better spent foraging, fighting and fornicating?

But fiction has enabled us not merely to imagine things, but to do so *collectively*. We can weave common myths such as the biblical creation story, the Dreamtime myths of Aboriginal Australians, and the nationalist myths of modern states. Such myths give Sapiens the unprecedented ability to cooperate flexibly in large numbers. Ants and bees can also work together in huge numbers, but they do so in a very rigid manner and only with close relatives. Wolves and chimpanzees cooperate far more flexibly than ants, but they can do so only with small numbers of other individuals that they know intimately. Sapiens can cooperate in extremely flexible ways with countless numbers of strangers. That's why Sapiens rule the world, whereas ants eat our leftovers and chimps are locked up in zoos and research laboratories.

僅有智人才能談論不存在的事物，並且相信早餐前能相信六個不可能的事情，這一點相對容易就可得到大家的共識。你不可能說服猴子給你香蕉，並向其承諾在猴子天堂中能無限供應香蕉。但這有何重要呢？畢竟，虛構的事物可能會誤導人或分散注意力。那些去森林找仙女和獨角獸的人，似乎比找蘑菇和鹿的人更容易生存。如果你花時間祈禱不存在的守護靈，難道你不是浪費寶貴的時間，該用來搜尋食物，打打鬥，抱抱小蘑菇嗎？但是小說使我們不僅僅可以想象事物，而且可以集體進行。我們可以編織共同的神話故事，例如聖經創世紀故事，澳洲原住民的夢時代神話以及現代國家的民族主義神話。這樣的神話故事使智人擁有了協同合作的前所未有的能力。螞蟻和蜜蜂也可以以龐大的數量一起工作，但他們的方式非常固定，且僅與親戚密切合作。狼和黑猩猩比螞蟻更靈活地合作，但他們只能與少數熟悉的其他個體進行合作。智人可以與無數的陌生人極其靈活地合作。這就是智人統治世界的原因，而螞蟻吃我們的殘羹剩菜，黑猩猩則被困在動物園和研究實驗室裡。

The Legend of Peugeot

Our chimpanzee cousins usually live in small troops of several dozen individuals. They form close friendships, hunt together and fight shoulder to shoulder against baboons, cheetahs and enemy chimpanzees. Their social

structure tends to be hierarchical. The dominant member, who is almost always a male, is termed the ‘alpha male’. Other males and females exhibit their submission to the alpha male by bowing before him while making grunting sounds, not unlike human subjects kowtowing before a king. The alpha male strives to maintain social harmony within his troop. When two individuals fight, he will intervene and stop the violence. Less benevolently, he might monopolise particularly coveted foods and prevent lower-ranking males from mating with the females.

When two males are contesting the alpha position, they usually do so by forming extensive coalitions of supporters, both male and female, from within the group. Ties between coalition members are based on intimate daily contact – hugging, touching, kissing, grooming and mutual favours. Just as human politicians on election campaigns go around shaking hands and kissing babies, so aspirants to the top position in a chimpanzee group spend much time hugging, back-slapping and kissing baby chimps. The alpha male usually wins his position not because he is physically stronger, but because he leads a large and stable coalition. These coalitions play a central part not only during overt struggles for the alpha position, but in almost all day-to-day activities. Members of a coalition spend more time together, share food, and help one another in times of trouble.

我們的黑猩猩表親通常生活在由數十個成員組成的小軍隊中。它們緊密友誼，聯合狩獵，並肩作戰，對抗狒狒，獵豹和敵對的黑猩猩。它們的社會結構往往是有等級制度的。統治成員，幾乎總是一個男性，被稱為“領袖”，其他雄性和雌性通過在底下矮聲低吼並鞠躬表現他們的臣服。領袖努力維持軍隊之內社會和諧。當兩個個體打架時，他會干預並停止暴力。不那麼仁慈地說，他可能會獨佔特別受人喜愛的食物，並防止低級別的雄性與雌性進行交配。當兩個雄性競爭領袖職位時，他們通常通過組成廣泛的支持者聯盟來競爭，包括組內的男性和女性。聯盟成員之間的關係基於日常親密接觸-擁抱，觸摸，接吻，梳理和相互幫忙。就像人類政治家在競選活動中四處握手和親吻嬰兒一樣，黑猩猩群體中的領袖候選人花費大量時間擁抱，拍背和親吻猩猩寶寶。領袖通常獲得其職位並不是因為他更強壯，而是因為他領導了一個龐大而穩定的聯盟。這些聯盟不僅在爭奪領袖職位的明顯鬥爭中起著核心作用，而且在幾乎所有日常活動中都運作良好。聯盟成員花更多時間在一起，分享食物，並在困難時互相幫助。

There are clear limits to the size of groups that can be formed and maintained in such a way. In order to function, all members of a group must know each other intimately. Two chimpanzees who have never met, never fought, and never engaged in mutual grooming will not know whether they can trust one another, whether it would be worthwhile to help one another, and which of them ranks higher. Under natural conditions, a typical chimpanzee troop consists of about twenty to fifty individuals. As the number of chimpanzees in a troop increases, the social order destabilises, eventually leading to a rupture and the formation of a new troop by some of the animals. Only in a handful of cases have zoologists observed groups larger than a hundred. Separate groups seldom cooperate, and tend to compete for territory and food. Researchers have documented prolonged warfare between groups, and even one case of ‘genocidal’ activity in which one troop systematically slaughtered most members of a neighbouring band. ²

在這種情況下，可以組成和維持的群體大小是有明顯限制的。為了發揮作用，群體的所有成員都必須互相瞭解。從未見面，從未打架，從未相互梳理的兩只黑猩猩將不知道彼此是否可以信任，是否值得互相幫助以及其中誰的地位更高。在自然條件下，一個典型的黑猩猩部隊包括大約二十到五十個成員。隨著黑猩猩的數量增加，社會秩序就會不穩定，最終導致一些動物破裂並形成新的部隊。只有在少數情況下，動物學家觀察到比一百個更大的群體。分開的群體很少合作，往往競爭領土和食物。研究人員記錄了群體之間長期的戰爭，甚至有一個“種族滅絕”的案例，其中一個部隊系統地屠殺了相鄰樂隊的大多數成員。

Similar patterns probably dominated the social lives of early humans, including archaic *Homo sapiens*. Humans, like chimps, have social instincts that enabled our ancestors to form friendships and hierarchies, and to hunt or fight together. However, like the social instincts of chimps, those of humans were adapted only for small intimate groups. When the group grew too large, its social order destabilised and the band split. Even if a particularly fertile valley could feed 500 archaic Sapiens, there was no way that so many strangers could live together. How could they agree who should be leader, who should hunt where, or who should mate with whom?

In the wake of the Cognitive Revolution, gossip helped *Homo sapiens* to form larger and more stable bands. But even gossip has its limits. Sociological research has shown that the maximum ‘natural’ size of a group bonded by gossip is about 150 individuals. Most people can neither intimately know, nor gossip effectively about, more than 150 human beings.

相似的模式可能在早期人類中佔主導地位，包括原始智人。人類像黑猩猩一樣，擁有社交本能，使我們的祖先能夠建立友誼和等級制度，並一起狩獵或戰鬥。然而，就像黑猩猩的社交本能一樣，人類的社交本能僅適用於小而親密的團體。當團體變得太大，它的社會秩序就會不穩定，團體就會分裂。即使一個特別肥沃的山谷可以養活500個原始智人，也沒有辦法讓那麼多的陌生人住在一起。他們如何同意誰應該是領袖，誰應該在哪裡狩獵，或者誰應該和誰交配？在認知革命之後，閒話家常幫助智人形成更大更穩定的團體。但即使閒話家常也有其限制。社會學研究表明，被閒話家常聯繫的群體的最大“自然”大小約為150個人。大多數人既不可能親密地了解，也不可能有效地閒話家常超過150個人。

Even today, a critical threshold in human organisations falls somewhere around this magic number. Below this threshold, communities, businesses, social networks and military units can maintain themselves based mainly on intimate acquaintance and rumour-mongering. There is no need for formal ranks, titles and law books to keep order.³ A platoon of thirty soldiers or even a company of a hundred soldiers can function well on the basis of intimate relations, with a minimum of formal discipline. A well-respected sergeant can become ‘king of the company and exercise authority even over commissioned officers. A small family business can survive and flourish without a board of directors, a CEO or an accounting department.

But once the threshold of 150 individuals is crossed, things can no longer work that way. You cannot run a division with thousands of soldiers the same way you run a platoon. Successful family businesses usually face a crisis when they grow larger and hire more personnel. If they cannot reinvent themselves, they go bust.

即使在今天，人類組織中的一個關鍵門檻大約在這個神奇數字周圍。低於此門檻，社區、企業、社交網絡和軍事部隊可以基於親密的相識

和流言蜚語維持自身運作。並不需要正式的階級、頭銜和法律著作來維持秩序。一個30人的小隊或甚至100人的連也可以建立在密切關係的基礎上很好地運作，只需要最少量的正式紀律。一個受人尊敬的中士可以成為“公司之王”，甚至對委任軍官也行使權威。一個小規模的家族企業可以在沒有董事會、首席執行官或會計部門的情況下生存和蓬勃發展。但一旦超過了150個人的門檻，情況就再也不能這樣運作了。你不能用同樣的方式來管理數千名士兵的師。成功的家族企業通常在變得更大並雇用更多的人員時面臨危機。如果他們不能重新發明自己，他們就破產了。

How did *Homo sapiens* manage to cross this critical threshold, eventually founding cities comprising tens of thousands of inhabitants and empires ruling hundreds of millions? The secret was probably the appearance of fiction. Large numbers of strangers can cooperate successfully by believing in common myths.

Any large-scale human cooperation – whether a modern state, a medieval church, an ancient city or an archaic tribe – is rooted in common myths that exist only in peoples collective imagination. Churches are rooted in common religious myths. Two Catholics who have never met can nevertheless go together on crusade or pool funds to build a hospital because they both believe that God was incarnated in human flesh and allowed Himself to be crucified to redeem our sins. States are rooted in common national myths. Two Serbs who have never met might risk their lives to save one another because both believe in the existence of the Serbian nation, the Serbian homeland and the Serbian flag. Judicial systems are rooted in common legal myths. Two lawyers who have never met can nevertheless combine efforts to defend a complete stranger because they both believe in the existence of laws, justice, human rights – and the money paid out in fees.

人類究竟如何跨越這個關鍵的門檻，最終創建起由數萬人組成的城市和統治數億人的帝國？秘密可能在於虛構的出現。大量陌生人可以通過相信共同的神話成功合作。任何大規模的人類合作——無論是現代國家、中世紀教堂、古代城市還是原始部落——都源於只存在於人們集體想像中的共同神話。教會根據共同的宗教神話而存在。即使從未見過面的兩位天主教徒也可以共同加入十字軍東征或籌集資金興建醫院，因為他們都相信上帝化身為人類，並允許自己被釘在十字架上，

以贖回我們的罪孽。國家基於共同的民族神話而存在。即使從未見過面的兩位塞爾維亞人可能會冒著生命危險去拯救對方，因為他們都相信塞爾維亞國、塞爾維亞祖國和塞爾維亞國旗的存在。司法制度基於共同的法律神話而存在。即使從未見過面的兩位律師也可以共同合作為一個完全陌生的人辯護，因為他們都相信法律、正義、人權——以及支付的費用。

Yet none of these things exists outside the stories that people invent and tell one another. There are no gods in the universe, no nations, no money, no human rights, no laws, and no justice outside the common imagination of human beings.

People easily understand that ‘primitives’ cement their social order by believing in ghosts and spirits, and gathering each full moon to dance together around the campfire. What we fail to appreciate is that our modern institutions function on exactly the same basis. Take for example the world of business corporations. Modern business-people and lawyers are, in fact, powerful sorcerers. The principal difference between them and tribal shamans is that modern lawyers tell far stranger tales. The legend of Peugeot affords us a good example.

然而，這些事物並不存在於人們所創造並互相講述的故事以外。宇宙中並沒有神靈、國家、貨幣、人權、法律和正義，除了人類普遍的想像力外，這些都不存在。人們很容易理解「原始人」信仰鬼神、聚集在滿月下一起圍繞營火跳舞是如何鞏固他們的社會秩序，但我們未能欣賞的是，我們現代的制度也是建立在相同的基礎上運作。以商業公司世界為例，現代商人和律師實際上是強大的巫師。他們與部落薩滿的主要區別在於現代律師講述的故事更加奇怪。Peugeot的傳說為我們提供了一個很好的例子。

An icon that somewhat resembles the Stadel lion-man appears today on cars, trucks and motorcycles from Paris to Sydney. It's the hood ornament that adorns vehicles made by Peugeot, one of the oldest and largest of Europe's carmakers. Peugeot began as a small family business in the village of Valentigney, just 300 kilometres from the Stadel Cave. Today the company employs about 200,000 people worldwide, most of whom are complete strangers to each other. These strangers cooperate so effectively that in 2008

Peugeot produced more than 1.5 million automobiles, earning revenues of about 55 billion euros.

In what sense can we say that Peugeot SA (the company's official name) exists? There are many Peugeot vehicles, but these are obviously not the company. Even if every Peugeot in the world were simultaneously jacked and sold for scrap metal, Peugeot SA would not disappear. It would continue to manufacture new cars and issue its annual report. The company owns factories, machinery and showrooms, and employs mechanics, accountants and secretaries, but all these together do not comprise Peugeot. A disaster might kill every single one of Peugeot's employees, and go on to destroy all of its assembly lines and executive offices. Even then, the company could borrow money, hire new employees, build new factories and buy new machinery. Peugeot has managers and shareholders, but neither do they constitute the company. All the managers could be dismissed and all its shares sold, but the company itself would remain intact.

一個與史達爾洞穴中的獅首人寫實略同的圖示，在今日出現在從巴黎到悉尼的汽車，卡車和摩托車上。這是裝飾歐洲最古老和最大的汽車製造商之一Peugeot的引擎蓋飾件。Peugeot最初作為一個小型家族企業在瓦朗蒂涅村成立，距離史達爾洞穴僅300公里。如今，該公司在全球約有20萬名員工，其中大部分彼此完全陌生。這些陌生人的合作效率如此高效，以至於在2008年，Peugeot生產了超過1.5萬輛汽車，營收約為550億歐元。我們可以用什麼方式來說Peugeot SA（公司的正式名稱）存在呢？有許多Peugeot汽車，但這些顯然不是公司。即使世界上的每一輛Peugeot同時被拋棄和賣掉，Peugeot SA也不會消失。它將繼續生產新車並發布其年度報告。該公司擁有工廠，機械和展廳，並雇用機械師，會計師和秘書，但所有這些加在一起也不構成Peugeot。一場災難可能會殺死Peugeot的每一位員工，並繼續摧毀其所有的裝配線和執行辦事處。即便如此，公司仍可以借錢、僱用新員工、建造新工廠和購買新機械。Peugeot有經理人和股東，但他們也不構成公司。所有經理人都可以被解雇，所有股份都可以出售，但是公司本身仍然保持完好。



5. The Peugeot Lion

It doesn't mean that Peugeot SA is invulnerable or immortal. If a judge were to mandate the dissolution of the company, its factories would remain standing and its workers, accountants, managers and shareholders would continue to live – but Peugeot SA would immediately vanish. In short, Peugeot SA seems to have no essential connection to the physical world. Does it really exist?

Peugeot is a figment of our collective imagination. Lawyers call this a 'legal fiction'. It can't be pointed at; it is not a physical object. But it exists as a legal entity. Just like you or me, it is bound by the laws of the countries in which it operates. It can open a bank account and own property. It pays taxes, and it can be sued and even prosecuted separately from any of the people who own or work for it.

5. 勃艮第雄獅 這並不意味著Peugeot SA是無敵的或不朽的。如果法官命令該公司解散，它的工廠仍會矗立，它的工人、會計師、經理和股東仍會繼續生活 - 但Peugeot SA將立即消失。總之，Peugeot SA似乎與物理世界沒有根本的聯繫。它真的存在嗎？Peugeot是我們集體想像的產物。律師稱之為“法律虛構”。它無法指向;它不是物理物體。但它作為一個法律實體存在。它和你我一樣，受其運營國家的法律約束。它可以開設銀行帳戶並擁有財產。它要支付稅款，可以受到拘留和甚至與任何擁有或工作於其中的人分開被起訴。

Peugeot belongs to a particular genre of legal fictions called ‘limited liability companies’. The idea behind such companies is among humanity’s most ingenious inventions. *Homo sapiens* lived for untold millennia without them. During most of recorded history property could be owned only by flesh-and-blood humans, the kind that stood on two legs and had big brains. If in thirteenth-century France Jean set up a wagon-manufacturing workshop, he himself was the business. If a wagon he’d made broke down a week after purchase, the disgruntled buyer would have sued Jean personally. If Jean had borrowed 1,000 gold coins to set up his workshop and the business failed, he would have had to repay the loan by selling his private property – his house, his cow, his land. He might even have had to sell his children into servitude. If he couldn’t cover the debt, he could be thrown in prison by the state or enslaved by his creditors. He was fully liable, without limit, for all obligations incurred by his workshop.

Peugeot 屬於特定類型的法律虛構，被稱為「有限責任公司」。這類公司的理念是人類最為巧妙的發明之一。*Homo sapiens* 沒有他們也能存活數千年。在大部分文獻記錄的歷史中，財產只能由血肉之軀的人們擁有，這種人類倚靠的是自己兩條腿和發達的大腦。如果13世紀的法國，Jean 創立一個車輛製造工作坊，那麼他本身就是這個生意。如果他所造的車子在購買一周後出現問題，那麼失望的買家就會起訴 Jean 個人。如果 Jean 借了1000枚金幣來建立他的工作坊，而生意失敗了，那麼他必須通過出售他的私人財產——他的房子，他的牛，他的土地——來還債。他甚至可能需要把孩子賣成奴隸來償還債務。如果他無法還債，他可能會被國家關進監獄，或者被債權人奴役。他應當對工作坊承擔的所有責任完全負責，沒有任何限制。

If you had lived back then, you would probably have thought twice before you opened an enterprise of your own. And indeed this legal situation discouraged entrepreneurship. People were afraid to start new businesses and take economic risks. It hardly seemed worth taking the chance that their families could end up utterly destitute.

This is why people began collectively to imagine the existence of limited liability companies. Such companies were legally independent of the people who set them up, or invested money in them, or managed them. Over the last few centuries such companies have become the main players in the economic

arena, and we have grown so used to them that we forget they exist only in our imagination. In the US, the technical term for a limited liability company is a ‘corporation’, which is ironic, because the term derives from ‘*corpus*’ (‘body’ in Latin) – the one thing these corporations lack. Despite their having no real bodies, the American legal system treats corporations as legal persons, as if they were flesh-and-blood human beings.

如果你生活在那個時代，你可能會好好考慮一下，才會開始自己的企業。實際上，這種法律情況抑制了創業精神。人們害怕開始新的生意和承擔經濟風險。他們很難想象冒險的代價，可能會使他們的家庭陷入赤貧。這就是為什麼人們開始集體想象有限責任公司的存在。這種公司在法律上獨立於成立它們、投資它們或管理它們的人們。在過去的幾個世紀裡，這些公司已成為經濟舞台上的主要角色，我們已經習慣了它們，以至於我們忘記它們只存在於我們的想象中。在美國，有限責任公司的技術術語是「公司」，這是具有諷刺意味的，因為該詞源自拉丁語的「*corpus*」（身體），這些公司唯一缺乏的就是身體。儘管它們沒有真正的身體，但美國的法律體系將公司視為法人，好像它們是有血有肉的人類一樣。

And so did the French legal system back in 1896, when Armand Peugeot, who had inherited from his parents a metalworking shop that produced springs, saws and bicycles, decided to go into the automobile business. To that end, he set up a limited liability company. He named the company after himself, but it was independent of him. If one of the cars broke down, the buyer could sue Peugeot, but not Armand Peugeot. If the company borrowed millions of francs and then went bust, Armand Peugeot did not owe its creditors a single franc. The loan, after all, had been given to Peugeot, the company, not to Armand Peugeot, the *Homo sapiens*. Armand Peugeot died in 1915. Peugeot, the company, is still alive and well.

How exactly did Armand Peugeot, the man, create Peugeot, the company? In much the same way that priests and sorcerers have created gods and demons throughout history, and in which thousands of French *curés* were still creating Christ’s body every Sunday in the parish churches. It all revolved around telling stories, and convincing people to believe them. In the case of the French *curés*, the crucial story was that of Christ’s life and death as told by the Catholic Church. According to this story, if a Catholic priest dressed

in his sacred garments solemnly said the right words at the right moment, mundane bread and wine turned into God's flesh and blood. The priest exclaimed '*Hoc est corpus meum!*' (Latin for 'This is my body!') and hocus pocus – the bread turned into Christ's flesh. Seeing that the priest had properly and assiduously observed all the procedures, millions of devout French Catholics behaved as if God really existed in the consecrated bread and wine.

法國的法律制度在1896年也是一樣，當時繼承了父母生產彈簧、鋸子和自行車的金屬加工店的Armand Peugeot決定進入汽車業務。為此，他成立了一家有限責任公司。他將公司以自己的名字命名，但是公司是獨立的。如果其中一輛汽車故障了，買家可以起訴Peugeot公司，但不能起訴Armand Peugeot。如果公司借了數百萬法郎，然後破產了，Armand Peugeot不欠債權人任何東西。畢竟，這筆貸款是給Peugeot公司的，而不是給Homo sapiens的Armand Peugeot。Armand Peugeot於1915年去世。Peugeot公司至今依然活躍並且繁榮。話說Armand Peugeot如何創建Peugeot公司呢？這與神職人員和巫師們在歷史上創造眾神和惡魔的方式非常相似，在法國的教堂中，成千上萬的基督教牧師仍在每個星期天創造基督的身體。這一切都圍繞著講述故事和說服人們相信它們。對於法國的神職人員來說，關鍵的故事就是天主教會所講述的基督的生命和死亡。根據這個故事，如果一位天主教司鐸穿上他的聖衣，在正確的時刻虔誠地說出正確的話語，平凡的麵包和葡萄酒就會變成上帝的肉體和血液。神父大喊'*Hoc est corpus meum!*'，(拉丁文的‘這是我的身體！’)，這個咒語就像變魔術一樣讓麵包變成了基督的身體。看到神職人員已經嚴格而刻苦地遵守了所有程序，數百萬虔誠的法國天主教徒行為就好像真的存在神一樣，並且相信麵包和葡萄酒中藏著上帝。

In the case of Peugeot SA the crucial story was the French legal code, as written by the French parliament. According to the French legislators, if a certified lawyer followed all the proper liturgy and rituals, wrote all the required spells and oaths on a wonderfully decorated piece of paper, and affixed his ornate signature to the bottom of the document, then hocus pocus – a new company was incorporated. When in 1896 Armand Peugeot wanted to create his company, he paid a lawyer to go through all these sacred procedures. Once the lawyer had performed all the right rituals and

pronounced all the necessary spells and oaths, millions of upright French citizens behaved as if the Peugeot company really existed.

Telling effective stories is not easy. The difficulty lies not in telling the story, but in convincing everyone else to believe it. Much of history revolves around this question: how does one convince millions of people to believe particular stories about gods, or nations, or limited liability companies? Yet when it succeeds, it gives Sapiens immense power, because it enables millions of strangers to cooperate and work towards common goals. Just try to imagine how difficult it would have been to create states, or churches, or legal systems if we could speak only about things that really exist, such as rivers, trees and lions.

關於Peugeot SA的案例，關鍵是由法國國會制定的法律法典。根據法國立法者的規定，如果一名經過認證的律師遵循所有正確的禮節和儀式，在一張華麗的紙上寫下所有必要的咒語和誓言，並將其華麗的簽名固定在文件底部，那麼，神奇地，一家新公司就會被納入其中。當Armand Peugeot於1896年想要創建他的公司時，他支付了一名律師來進行所有這些神聖的程序。一旦律師完成了所有正確的儀式，並宣布所有必要的咒語和誓言，數百萬正直的法國公民就像Peugeot公司真的存在一樣行事。講述有效故事並不容易。困難不在於講述故事，而在於說服其他所有人相信它。許多歷史圍繞著這個問題：如何說服數百萬人相信有關神祇、國家或有限責任公司的特定故事？然而，當它成功時，它給予Sapiens巨大的力量，因為它使數百萬陌生人能夠合作並朝著共同的目標努力。試著想象一下，如果我們只能講述像河流、樹木和獅子等真正存在的事物，那麼建立國家、教堂或法律制度會有多麼困難。

Over the years, people have woven an incredibly complex network of stories. Within this network, fictions such as Peugeot not only exist, but also accumulate immense power. The kinds of things that people create through this network of stories are known in academic circles as ‘fictions’, ‘social constructs’, or ‘imagined realities’. An imagined reality is not a lie. I lie when I say that there is a lion near the river when I know perfectly well that there is no lion there. There is nothing special about lies. Green monkeys and chimpanzees can lie. A green monkey, for example, has been observed calling ‘Careful! A lion!’ when there was no lion around. This alarm

conveniently frightened away a fellow monkey who had just found a banana, leaving the liar all alone to steal the prize for itself.

多年來，人們編織了一個極其複雜的故事網絡。在這個網絡中，像 Peugeot 這樣的虛構故事不僅存在，而且積累了巨大的力量。人們通過這個故事網絡創造的種種事物在學術界被稱為“虛構故事”、“社會建構”或“想像的現實”。一個想像的現實不是謊言。當我明知道河邊沒有獅子，卻說有一頭獅子時，我在撒謊。謊言並沒有什麼特別的。綠猴和黑猩猩都能說謊。例如，有觀察到一隻綠猴看到有另一隻猴子發現了一根香蕉，就報警說：“小心！有一頭獅子！”其實那裡根本沒有獅子。這個謊言讓其他猴子害怕逃走，把香蕉留給了說謊的綠猴。

Unlike lying, an imagined reality is something that everyone believes in, and as long as this communal belief persists, the imagined reality exerts force in the world. The sculptor from the Stadel Cave may sincerely have believed in the existence of the lion-man guardian spirit. Some sorcerers are charlatans, but most sincerely believe in the existence of gods and demons. Most millionaires sincerely believe in the existence of money and limited liability companies. Most human-rights activists sincerely believe in the existence of human rights. No one was lying when, in 2011, the UN demanded that the Libyan government respect the human rights of its citizens, even though the UN, Libya and human rights are all figments of our fertile imaginations.

Ever since the Cognitive Revolution, Sapiens has thus been living in a dual reality. On the one hand, the objective reality of rivers, trees and lions; and on the other hand, the imagined reality of gods, nations and corporations. As time went by, the imagined reality became ever more powerful, so that today the very survival of rivers, trees and lions depends on the grace of imagined entities such as gods, nations and corporations.

不同於謊言，想像中的現實是每個人都相信的東西，只要這種共同信仰持續存在，那麼這種想像中的現實就會對世界產生影響。斯塔德爾洞穴的雕塑家可能真誠地相信獅人守護靈的存在。一些巫師是騙子，但大多數真誠地相信神和惡魔的存在。大多數百萬富翁真誠地相信錢和有限責任公司的存在。大多數人權活動家真誠地相信人權的存在。即使聯合國、利比亞和人權都是我們豐富想像的產物，但在 2011 年，當聯合國要求利比亞政府尊重其公民的人權時，沒有人在說謊。自認

知革命以來，智人因此生活在一個雙重現實中。一方面是河流、樹木和獅子等客觀現實；另一方面是神、國家和公司等想像中的現實。隨著時間的推移，想像中的現實變得越來越強大，以至於今天河流、樹木和獅子的生存都取決於像神、國家和公司這樣的想像實體的寬容。

Bypassing the Genome

The ability to create an imagined reality out of words enabled large numbers of strangers to cooperate effectively. But it also did something more. Since large-scale human cooperation is based on myths, the way people cooperate can be altered by changing the myths – by telling different stories. Under the right circumstances myths can change rapidly. In 1789 the French population switched almost overnight from believing in the myth of the divine right of kings to believing in the myth of the sovereignty of the people. Consequently, ever since the Cognitive Revolution *Homo sapiens* has been able to revise its behaviour rapidly in accordance with changing needs. This opened a fast lane of cultural evolution, bypassing the traffic jams of genetic evolution. Speeding down this fast lane, *Homo sapiens* soon far outstripped all other human and animal species in its ability to cooperate.

用文字創造想像中的現實能讓大量陌生人有效合作，但它同時也做了更多的事情。由於大規模人類合作是基於神話的，而人們的合作方式可以通過改變神話——講述不同的故事來改變。在正確的情況下，神話可以快速改變。1789年，法國人口幾乎在一夜之間從相信君權神授的神話轉向相信人民民主權的神話。因此，自從認知革命以來，智人可以根據不斷變化的需求快速修訂自己的行為，這開闢了一條文化進化的快車道，繞過遺傳進化的交通擁堵。在這條快車道上飛馳，智人很快就在合作能力上遠遠超越了其他所有人類和動物物種。

The behaviour of other social animals is determined to a large extent by their genes. DNA is not an autocrat. Animal behaviour is also influenced by environmental factors and individual quirks. Nevertheless, in a given environment, animals of the same species will tend to behave in a similar way. Significant changes in social behaviour cannot occur, in general, without genetic mutations. For example, common chimpanzees have a genetic tendency to live in hierarchical groups headed by an alpha male. Members of

a closely related chimpanzee species, bonobos, usually live in more egalitarian groups dominated by female alliances. Female common chimpanzees cannot take lessons from their bonobo relatives and stage a feminist revolution. Male chimps cannot gather in a constitutional assembly to abolish the office of alpha male and declare that from here on out all chimps are to be treated as equals. Such dramatic changes in behaviour would occur only if something changed in the chimpanzees' DNA.

其他社交動物的行為在很大程度上是由它們的基因所決定的。DNA不是獨裁者。動物行為也受到環境因素和個體的怪癖的影響。然而，在一個特定的環境中，同一物種的動物傾向於表現出相似的行為。通常情況下，社交行為的顯著改變是不可能發生的，除非出現基因突變。例如，黑猩猩通常有一種生活在由一隻領袖公猩猩率領的等級制度群體的基因傾向。而與之相近的黑猩猩物種——倭黑猩猩，通常生活在更平等的被女性聯盟支配的群體當中。女黑猩猩不能從它們的倭黑猩猩親戚身上學習如何進行女權主義鬥爭。公猩猩也不能聚集在憲法會議上廢除領袖公猩猩的職位，並宣佈從現在開始，所有猩猩都應被平等對待。這樣顯著的行為變化只有在黑猩猩的DNA發生改變時才可能發生。

For similar reasons, archaic humans did not initiate any revolutions. As far as we can tell, changes in social patterns, the invention of new technologies and the settlement of alien habitats resulted from genetic mutations and environmental pressures more than from cultural initiatives. This is why it took humans hundreds of thousands of years to make these steps. Two million years ago, genetic mutations resulted in the appearance of a new human species called *Homo erectus*. Its emergence was accompanied by the development of a new stone tool technology, now recognised as a defining feature of this species. As long as *Homo erectus* did not undergo further genetic alterations, its stone tools remained roughly the same – for close to 2 million years!

In contrast, ever since the Cognitive Revolution, Sapiens have been able to change their behaviour quickly, transmitting new behaviours to future generations without any need of genetic or environmental change. As a prime example, consider the repeated appearance of childless elites, such as the Catholic priesthood, Buddhist monastic orders and Chinese eunuch

bureaucracies. The existence of such elites goes against the most fundamental principles of natural selection, since these dominant members of society willingly give up procreation. Whereas chimpanzee alpha males use their power to have sex with as many females as possible – and consequently sire a large proportion of their troop’s young – the Catholic alpha male abstains completely from sexual intercourse and childcare. This abstinence does not result from unique environmental conditions such as a severe lack of food or want of potential mates. Nor is it the result of some quirky genetic mutation. The Catholic Church has survived for centuries, not by passing on a ‘celibacy gene’ from one pope to the next, but by passing on the stories of the New Testament and of Catholic canon law.

出於相似的原因，古代人類沒有發起任何革命。據我們所知，社會模式的變化、新技術的發明以及對外來生境的開拓更多來自於基因突變和環境壓力，而非文化倡議。這也是為什麼人類花費數十萬年才能走過這些階段。兩百萬年前，基因突變導致一種名為直立人的新人類物種出現。它的出現伴隨著一種新石器技術的發展，現在被認為是這個物種的一個關鍵特徵。只要直立人沒有進一步的基因改變，它的石器一直保持差不多的樣子-長達近200萬年！相反，自認知革命以來，智人已經能夠快速改變他們的行為，在不需要基因或環境改變的情況下將新行為傳遞給未來的世代。最好的例子是，考慮不斷出現的無子女精英階層，如天主教神職人員、佛教修道院和中國宦官官僚。這些精英存在違反自然選擇最基本原則，因為這些社會的主導成員自願放棄繁殖。而黑猩猩的領袖雄性利用他們的權力盡可能地與多個女性交配，並因此創下大量的后代——而天主教主教完全放棄性交和育兒。這種節制不是由於獨特的環境條件（如嚴重的食物短缺或缺乏潛在的配偶），也不是奇怪的遺傳突變的結果。天主教會已經存活了幾個世紀，不是通過從一位教皇傳遞一個“獨身遺傳”基因，而是通過傳遞新約聖經和天主教法教條的故事。

In other words, while the behaviour patterns of archaic humans remained fixed for tens of thousands of years, Sapiens could transform their social structures, the nature of their interpersonal relations, their economic activities and a host of other behaviours within a decade or two. Consider a resident of Berlin, born in 1900 and living to the ripe age of one hundred. She spent her childhood in the Hohenzollern Empire of Wilhelm II; her adult years in the Weimar Republic, the Nazi Third Reich and Communist East

Germany; and she died a citizen of a democratic and reunified Germany. She had managed to be a part of five very different sociopolitical systems, though her DNA remained exactly the same.

This was the key to Sapiens' success. In a one-on-one brawl, a Neanderthal would probably have beaten a Sapiens. But in a conflict of hundreds, Neanderthals wouldn't stand a chance. Neanderthals could share information about the whereabouts of lions, but they probably could not tell – and revise – stories about tribal spirits. Without an ability to compose fiction, Neanderthals were unable to cooperate effectively in large numbers, nor could they adapt their social behaviour to rapidly changing challenges.

換句話說，原始人的行為模式固定了數萬年，而智人能夠在十年或二十年內改變他們的社會結構、人際關係的性質、經濟活動和其他許多行為。考慮一位於 1900 年出生、壽命長達一百歲的柏林居民。她童年時代是威廉二世統治下的霍亨索倫帝國；成年時期經歷過魏瑪共和國、納粹德國和東德共產主義；最後成為一個民主和團結的德國公民去世。她成功地成為了五個非常不同的社會政治體系的一部分，儘管她的 DNA 保持不變。這是智人成功的關鍵。在一對一的爭鬥中，尼安德特人可能會打敗智人。但在數百人的衝突中，尼安德特人是沒有機會的。尼安德特人可以分享獅子的位置信息，但他們可能無法講述 - 並修改 - 關於部落精神的故事。沒有講虛構故事的能力，尼安德特人無法有效地在大量人數中合作，也無法適應快速變化的挑戰。

While we can't get inside a Neanderthal mind to understand how they thought, we have indirect evidence of the limits to their cognition compared with their Sapiens rivals. Archaeologists excavating 30,000-year-old Sapiens sites in the European heartland occasionally find there seashells from the Mediterranean and Atlantic coasts. In all likelihood, these shells got to the continental interior through long-distance trade between different Sapiens bands. Neanderthal sites lack any evidence of such trade. Each group manufactured its own tools from local materials. ⁴



6. The Catholic alpha male abstains from sexual intercourse and childcare, even though there is no genetic or ecological reason for him to do so .

Another example comes from the South Pacific. Sapiens bands that lived on the island of New Ireland, north of New Guinea, used a volcanic glass called obsidian to manufacture particularly strong and sharp tools. New Ireland, however, has no natural deposits of obsidian. Laboratory tests revealed that the obsidian they used was brought from deposits on New Britain, an island 400 kilometres away. Some of the inhabitants of these islands must have been skilled navigators who traded from island to island over long distances. [5](#)

我們無法進入尼安德特人的思想，理解他們的想法，但我們有間接證據表明，與智人競爭相比，他們的認知能力有限。在歐洲中部挖掘3萬

年前的智人遺址時，考古學家偶爾會發現來自地中海和大西洋沿岸的海貝殼。很可能是透過不同智人群之間的遠距離貿易到達內陸大陸。尼安德特人的遺址缺乏任何此類貿易的證據。每個群體都使用當地材料製造自己的工具。6. 天主教的阿爾法雄性不進行性交和育兒，即使沒有任何遺傳或生態上的理由也是如此。另一個例子來自南太平洋。居住在新幾內亞北部的新愛爾蘭島上的智人群體使用一種名為黑曜石的火山玻璃製造特別強和鋒利的工具。然而，新愛爾蘭島沒有黑曜石的天然礦床。實驗室測試顯示，他們使用的黑曜石來自400公里外的新不列顛島的礦床。這些島嶼的一些居民必須是熟練的航行者，可以從一個島嶼到另一個島嶼進行長距離貿易。

Trade may seem a very pragmatic activity, one that needs no fictive basis. Yet the fact is that no animal other than Sapiens engages in trade, and all the Sapiens trade networks about which we have detailed evidence were based on fictions. Trade cannot exist without trust, and it is very difficult to trust strangers. The global trade network of today is based on our trust in such fictional entities as the dollar, the Federal Reserve Bank, and the totemic trademarks of corporations. When two strangers in a tribal society want to trade, they will often establish trust by appealing to a common god, mythical ancestor or totem animal.

If archaic Sapiens believing in such fictions traded shells and obsidian, it stands to reason that they could also have traded information, thus creating a much denser and wider knowledge network than the one that served Neanderthals and other archaic humans.

貿易看起來是一個非常務實的活動，它不需要虛構的基礎。然而事實是，除了智人以外，沒有任何其他的動物參與貿易，且我們有詳細證據顯示，所有的智人貿易網絡都是建立在虛構的基礎之上。沒有信任就沒有貿易，而對於陌生人的信任非常困難建立。今天的全球貿易網絡是基於我們對於虛構實體如美元、美聯儲和企業圖騰商標的信任。當部落社會裡的兩個陌生人想要進行貿易時，他們通常會透過對同一個神靈、神話先祖或圖騰動物的信仰建立信任。如果古人類相信這樣的虛構，並進行貝殼和黑曜石的貿易，那麼他們也很有可能進行信息的貿易，進而建立一個更加密集和更廣泛的知識網絡，這比為尼安德特人和其他古人類服務的那個網絡更加發達。

Hunting techniques provide another illustration of these differences. Neanderthals usually hunted alone or in small groups. Sapiens, on the other hand, developed techniques that relied on cooperation between many dozens of individuals, and perhaps even between different bands. One particularly effective method was to surround an entire herd of animals, such as wild horses, then chase them into a narrow gorge, where it was easy to slaughter them en masse. If all went according to plan, the bands could harvest tons of meat, fat and animal skins in a single afternoon of collective effort, and either consume these riches in a giant potlatch, or dry, smoke or (in Arctic areas) freeze them for later usage. Archaeologists have discovered sites where entire herds were butchered annually in such ways. There are even sites where fences and obstacles were erected in order to create artificial traps and slaughtering grounds.

狩獵技術提供了這些差異的另一個例子。尼安德特人通常獨自或在小團體中狩獵。薩比恩斯，另一方面，發展出依賴許多十幾個人之間甚至不同樂隊之間合作的技術。一種特別有效的方法是圍繞整群動物，例如野馬，然後追趕它們進入狹窄的峽谷，在那裡很容易屠宰它們。如果一切按計劃進行，樂隊可以在一個下午的集體努力中收獲數噸的肉，脂肪和動物皮革，然後在一個巨大的公平交易中消耗這些財富，或乾燥，煙燻或（在北極地區）凍結它們以供日後使用。考古學家已經發現了在這些方式下每年屠宰整個群體的地點。甚至有一些地點建立圍欄和障礙物，以創建人工陷阱和屠宰場。

We may presume that Neanderthals were not pleased to see their traditional hunting grounds turned into Sapiens-controlled slaughterhouses. However, if violence broke out between the two species, Neanderthals were not much better off than wild horses. Fifty Neanderthals cooperating in traditional and static patterns were no match for 500 versatile and innovative Sapiens. And even if the Sapiens lost the first round, they could quickly invent new stratagems that would enable them to win the next time.

What happened in the Cognitive Revolution?

New ability	Wider consequences
The ability to transmit larger quantities of	Planning and carrying out

information about the world surrounding *Homo sapiens* complex actions, such as avoiding lions and hunting bison

The ability to transmit larger quantities of information about Sapiens social relationships

Larger and more cohesive groups, numbering up to 150 individuals

The ability to transmit information about things that do not really exist, such as tribal spirits, nations, limited liability companies, and human rights

- a. Cooperation between very large numbers of strangers
 - b. Rapid innovation of social behaviour
-

History and Biology

The immense diversity of imagined realities that Sapiens invented, and the resulting diversity of behaviour patterns, are the main components of what we call ‘cultures’. Once cultures appeared, they never ceased to change and develop, and these unstoppable alterations are what we call ‘history’.

我們可以假定奈安德特人不樂見他們傳統的狩獵區成為智人控制的屠房。然而，如果兩種物種之間發生暴力衝突，奈安德特人並不比野馬好到哪裡去。協作使用傳統和靜態模式的五十名奈安德特人根本不是五百名具有多才多藝的智人的對手。即使智人在第一輪失敗，他們也可以迅速創造新的策略，使他們能夠贏得下一次。智人所創造的豐富多樣的想象現實，以及由此產生的行為模式的多樣性，是我們稱為“文化”的主要組成部分。一旦文化出現，它們就從未停止過改變和發展，這些不可阻擋的改變就是我們所謂的“歷史”。

The Cognitive Revolution is accordingly the point when history declared its independence from biology. Until the Cognitive Revolution, the doings of all human species belonged to the realm of biology, or, if you so prefer, prehistory (I tend to avoid the term ‘prehistory’, because it wrongly implies that even before the Cognitive Revolution, humans were in a category of their own). From the Cognitive Revolution onwards, historical narratives replace biological theories as our primary means of explaining the development of *Homo sapiens*. To understand the rise of Christianity or the French

Revolution, it is not enough to comprehend the interaction of genes, hormones and organisms. It is necessary to take into account the interaction of ideas, images and fantasies as well.

認知革命，代表著歷史從生物學中解放出來的那一刻。在認知革命之前，所有人類種族的行為都屬於生物學領域，或者，如果你這樣想的話，是史前時期（我傾向於避免使用“史前”這個詞，因為它錯誤地暗示了即使在認知革命之前，人類也已經有了自己的類別）。從認知革命開始，歷史的敘述取代了生物學理論成為我們解釋智人發展的主要手段。要理解基督教或法國大革命的興起，不僅需要理解基因、荷爾蒙和生物體的相互作用，還需要考慮到意念、形象和幻想的相互作用。

This does not mean that *Homo sapiens* and human culture became exempt from biological laws. We are still animals, and our physical, emotional and cognitive abilities are still shaped by our DNA. Our societies are built from the same building blocks as Neanderthal or chimpanzee societies, and the more we examine these building blocks – sensations, emotions, family ties – the less difference we find between us and other apes.

It is, however, a mistake to look for the differences at the level of the individual or the family. One on one, even ten on ten, we are embarrassingly similar to chimpanzees. Significant differences begin to appear only when we cross the threshold of 150 individuals, and when we reach 1,000–2,000 individuals, the differences are astounding. If you tried to bunch together thousands of chimpanzees into Tiananmen Square, Wall Street, the Vatican or the headquarters of the United Nations, the result would be pandemonium. By contrast, Sapiens regularly gather by the thousands in such places. Together, they create orderly patterns – such as trade networks, mass celebrations and political institutions – that they could never have created in isolation. The real difference between us and chimpanzees is the mythical glue that binds together large numbers of individuals, families and groups. This glue has made us the masters of creation.

這並不意味著智人和人類文化因此免於生物定律的約束。我們仍然是動物，我們的身體、情感和認知能力仍然受到DNA的影響。我們的社會建立在與尼安德特人或黑猩猩社會相同的基石上，而當我們探究這

些基石——感覺、情感、家庭關係時，我們發現自己和其他類人猿之間的區別越來越少。然而，在個體或家庭層面尋找差異是一個錯誤。一對一，甚至十對十，我們和黑猩猩非常相似。只有當我們跨越了150個個體的門檻時，重要的差異才開始出現，而當我們達到1,000至2,000個個體時，差異是驚人的。如果你試圖把成千上萬的黑猩猩聚集在天安門廣場、華爾街、梵蒂岡或聯合國總部，結果會是一片混亂。相比之下，智人經常在這樣的地方集結成千上萬。他們共同創造有秩序的模式——如貿易網絡、大型慶祝活動和政治機構——這些模式是他們在孤立狀態下永遠創造不出來的。我們和黑猩猩之間真正的區別在於神話中的膠水，它將大量的個體、家庭和團體聚合在一起。這種膠水使我們成為創造的主宰。

Of course, we also needed other skills, such as the ability to make and use tools. Yet tool-making is of little consequence unless it is coupled with the ability to cooperate with many others. How is it that we now have intercontinental missiles with nuclear warheads, whereas 30,000 years ago we had only sticks with flint spearheads? Physiologically, there has been no significant improvement in our tool-making capacity over the last 30,000 years. Albert Einstein was far less dexterous with his hands than was an ancient hunter-gatherer. However, our capacity to cooperate with large numbers of strangers has improved dramatically. The ancient flint 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.

當然，我們還需要其他技能，例如製造和使用工具的能力。然而，除非將製造工具與與許多人合作的能力結合在一起，否則製造工具的意義不大。30,000年前，我們只有帶有燧石矛頭的木棒，現在我們有了帶有核彈頭的洲際導彈，這是怎麼回事呢？從生理上講，過去30,000年來，我們的工具製造能力沒有顯著的提升。阿爾伯特·愛因斯坦的手部技巧遠不如古代的狩獵采集者。然而，我們與大量陌生人合作的能力顯著提高。古代的燧石矛頭由一個人在幾分鐘內製造完成，他依賴一些親密朋友的建議和幫助。現代核彈頭的生產需要全球數百萬陌生

人的合作--從在地球深處開採鈾礦石的工人到寫長篇數學公式來描述亞原子粒子交互作用的理論物理學家。

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.

綜合認識『認知革命』後生物學與歷史之關係： a. 生物學規定智人的行為和能力的基本參數值，所有歷史事件皆發生於此生物學範圍內。 b. 但是，此生物學範圍相當廣大，使智人能夠參與多種驚人的活動。多虧想象虛構的能力，智人能夠創造越來越複雜的活動，每一代人都進一步發展和精進。 c. 因此，若想理解智人的行為，必須了解其行動的歷史演變。僅以生物學限制去描述，就像是一位收聽世界杯足球賽的電台解說員只詳細描述球場而非球員在做什麼。

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.

* Here and in the following pages, when speaking about Sapiens language, I refer to the basic linguistic abilities of our species and not to a particular dialect. English, Hindi and Chinese are all variants of Sapiens language. Apparently, even at the time of the Cognitive Revolution, different Sapiens groups had different dialects.

我們的石器時代祖先在歷史的競技場上玩什麼遊戲？據我們所知，三萬年前雕刻斯塔德爾獅人的人們，擁有與我們一樣的身體、情感和智力能力。他們早上起床後做什麼？早餐和午餐吃什麼？他們的社會是什麼樣子的？他們有一夫一妻制的關係和核心家庭嗎？他們有儀式、道德規範、體育比賽和宗教儀式嗎？他們打仗嗎？下一章將瞥見歷史的幕後，探討在認知革命與農業革命之間的千年中生活是什麼樣子的。*在這裡和接下來的頁面，當談到智人語言時，我指的是我們物种的基本語言能力，而不是特定的方言。英語、印地語和中文都是智人語言的變體。顯然，在認知革命時期，不同的智人群體有不同的方言。

3

A Day in the Life of Adam and Eve

TO UNDERSTAND OUR NATURE, HISTORY and psychology, we must get inside the heads of our hunter-gatherer ancestors. For nearly the entire history of our species, Sapiens lived as foragers. The past 200 years, during which ever increasing numbers of Sapiens have obtained their daily bread as urban labourers and office workers, and the preceding 10,000 years, during which most Sapiens lived as farmers and herders, are the blink of an eye compared to the tens of thousands of years during which our ancestors hunted and gathered.

The flourishing field of evolutionary psychology argues that many of our present-day social and psychological characteristics were shaped during this long pre-agricultural era. Even today, scholars in this field claim, our brains and minds are adapted to a life of hunting and gathering. Our eating habits, our conflicts and our sexuality are all the result of the way our hunter-gatherer minds interact with our current post-industrial environment, with its mega-cities, aeroplanes, telephones and computers. This environment gives us more material resources and longer lives than those enjoyed by any previous generation, but it often makes us feel alienated, depressed and pressured. To understand why, evolutionary psychologists argue, we need to delve into the hunter-gatherer world that shaped us, the world that we subconsciously still inhabit.

為了理解我們的本性、歷史和心理，我們必須深入我們的獵食祖先思考。在我們物種的整個歷史中，智人都是以採集者的方式生活。過去的200年，越來越多的智人成為城市勞工和辦公室工作者，而前10,000年，大多數智人是農民和牧民。這在我們的祖先狩獵和採集的數萬年中是微不足道的。進化心理學這個蓬勃發展的領域認為，我們現今的社會和心理特徵在這個漫長的非農業時期形成。甚至在今天，這個領域的學者聲稱，我們的大腦和心靈都適應了狩獵和採集的生活。我們

的飲食習慣、衝突和性行為都是我們的獵食思考方式與現今後工業環境互動的結果，包括城市、飛機、電話和電腦等。這個環境給了我們比之前的任何一代都更豐富的物質資源和更長久的生命，但它常常讓我們感到疏離、沮喪和壓力。進化心理學家認為，為了理解這一點，我們需要深入挖掘塑造我們的獵食世界，以及我們仍然潛意識中在其中生活的世界。

Why, for example, do people gorge on high-calorie food that is doing little good to their bodies? Today's affluent societies are in the throes of a plague of obesity, which is rapidly spreading to developing countries. It's a puzzle why we binge on the sweetest and greasiest food we can find, until we consider the eating habits of our forager forebears. In the savannahs and forests they inhabited, high-calorie sweets were extremely rare and food in general was in short supply. A typical forager 30,000 years ago had access to only one type of sweet food – ripe fruit. If a Stone Age woman came across a tree groaning with figs, the most sensible thing to do was to eat as many of them as she could on the spot, before the local baboon band picked the tree bare. The instinct to gorge on high-calorie food was hard-wired into our genes. Today we may be living in high-rise apartments with over-stuffed refrigerators, but our DNA still thinks we are in the savannah. That's what makes us spoon down an entire tub of Ben & Jerry's when we find one in the freezer and wash it down with a jumbo Coke.

例如，為什麼人們狼吞虎嚥吃高熱量的食物，這對他們的身體沒有什麼好處？今天的富裕社會正陷入肥胖疫情之中，這個問題正在快速蔓延到發展中國家。我們為什麼要暴飲暴食最甜和最油膩的食物，直到我們考慮到我們的狩獵採集祖先的飲食習慣時，這才成了一個謎。在他們所生活的大草原和森林中，高熱量食物非常罕見，總的來說，食物供應非常短缺。在大約三萬年前的typical forager時代，只能接觸一種甜食——成熟的水果。如果一位石器時代的婦女發現一棵滿載無比的無花果樹，最明智的做法是當場盡可能多地吃掉它們，以免當地的狒狒團把樹吃光。狼吞虎嚥吃高熱量食物的本能已經在我們的基因中得到鞏固。今天我們可能住在高樓公寓中，冰箱裡裝滿了食物，但是我們的DNA仍然認為我們處於大草原之中。這就是當我們在冰柜裡找到一桶班傑利冰淇淋時，為什麼我們會大口喝下一大杯可樂的原因。

This ‘gorging gene’ theory is widely accepted. Other theories are far more contentious. For example, some evolutionary psychologists argue that ancient foraging bands were not composed of nuclear families centred on monogamous couples. Rather, foragers lived in communes devoid of private property, monogamous relationships and even fatherhood. In such a band, a woman could have sex and form intimate bonds with several men (and women) simultaneously, and all of the band’s adults cooperated in parenting its children. Since no man knew definitively which of the children were his, men showed equal concern for all youngsters.

Such a social structure is not an Aquarian utopia. It’s well documented among animals, notably our closest relatives, the chimpanzees and bonobos. There are even a number of present-day human cultures in which collective fatherhood is practised, as for example among the Barí Indians. According to the beliefs of such societies, a child is not born from the sperm of a single man, but from the accumulation of sperm in a woman’s womb. A good mother will make a point of having sex with several different men, especially when she is pregnant, so that her child will enjoy the qualities (and paternal care) not merely of the best hunter, but also of the best storyteller, the strongest warrior and the most considerate lover. If this sounds silly, bear in mind that before the development of modern embryological studies, people had no solid evidence that babies are always sired by a single father rather than by many.

「暴食基因」理論廣受認同，但其他理論卻引起爭議。例如，一些進化心理學家認為，古代的採集團體並非以核心家庭為中心，而是生活在沒有私有財產、一夫一妻制和父權的公社中。在這樣的團體中，一個女人可以與多位男人（和女人）同時發生性關係並建立親密關係，所有成年人都合作育兒。由於沒有男人能明確知道哪些孩子是他的，男人們對所有的孩子都表現出相等的關注。這樣的社會結構不是水瓶座烏托邦。在動物中，特別是我們最親密的親戚黑猩猩和倭黑猩猩中有許多相關證據。現今還有一些人類社會實行集體父權制度，例如巴里印第安人。根據這些社會的信仰，一個孩子不是從一個男人的精子中誕生，而是從女人子宮中的多個精子積累而來。好母親會特別與幾個不同的男人發生性關係，尤其是在懷孕期間，以便她的孩子不僅享有最優秀的獵人的品質（和父親的照顧），還會得到最好的故事講述者、最強壯的戰士和最體貼的愛人的品質。如果這聽起來很傻，請記

住，在現代胚胎學研究發展之前，人們沒有堅實的證據表明嬰兒總是
由單一的父親而非多個父親生育。

The proponents of this ‘ancient commune’ theory argue that the frequent infidelities that characterise modern marriages, and the high rates of divorce, not to mention the cornucopia of psychological complexes from which both children and adults suffer, all result from forcing humans to live in nuclear families and monogamous relationships that are incompatible with our biological software.¹

Many scholars vehemently reject this theory, insisting that both monogamy and the forming of nuclear families are core human behaviours. Though ancient hunter-gatherer societies tended to be more communal and egalitarian than modern societies, these researchers argue, they were nevertheless comprised of separate cells, each containing a jealous couple and the children they held in common. This is why today monogamous relationships and nuclear families are the norm in the vast majority of cultures, why men and women tend to be very possessive of their partners and children, and why even in modern states such as North Korea and Syria political authority passes from father to son.

「古老公社主義」的支持者認為，現代婚姻普遍存在的不忠行為、高離婚率，以及兒童和成年人都遭受的心理困擾，都是因為迫使人類生活在不適合我們生物軟體的核心家庭和一夫一妻的關係中而產生的。許多學者強烈反對這一理論，堅稱一夫一妻制和核心家庭都是人類的核心行為。儘管古老的獵人採集社會往往比現代社會更具共同性和平等性，但這些研究人員認為，它們仍然由單獨的細胞組成，每個細胞都包含一對嫉妒的夫妻和他們所共有的孩子。這就是為什麼現今一夫一妻制關係和核心家庭在絕大多數文化中是常態，為什麼男女都很 possessive of their partners and children，以及為什麼即使在像北韓和敘利亞這樣的現代國家中，政治權力也會從父親傳到兒子的原因。

In order to resolve this controversy and understand our sexuality, society and politics, we need to learn something about the living conditions of our ancestors, to examine how Sapiens lived between the Cognitive Revolution of 70,000 years ago, and the start of the Agricultural Revolution about 12,000 years ago.

Unfortunately, there are few certainties regarding the lives of our forager ancestors. The debate between the ‘ancient commune’ and ‘eternal monogamy’ schools is based on flimsy evidence. We obviously have no written records from the age of foragers, and the archaeological evidence consists mainly of fossilised bones and stone tools. Artefacts made of more perishable materials – such as wood, bamboo or leather – survive only under unique conditions. The common impression that pre-agricultural humans lived in an age of stone is a misconception based on this archaeological bias. The Stone Age should more accurately be called the Wood Age, because most of the tools used by ancient hunter-gatherers were made of wood.

為了解決這場爭執並理解我們的性向、社會和政治，我們需要了解我們祖先的生活條件，檢視智人在距今7萬年前的認知革命和約1萬2千年前農業革命開始之間的生活方式。不幸的是，對於我們的採集祖先的生活方式，我們知道的很少。「古代公社」和「永恆的一夫一妻制」學派之間的辯論是根基不穩的。我們從採集時代沒有書面記錄，考古學材料主要是化石骨骼和石頭工具。由更易腐敗的物料製成的人造物品，如木材、竹子或皮革，只有在獨特的條件下才能保存。對於先農業時代的人類生活在石器時代的普遍印象是一個基於這種考古偏見的誤解。石器時代應更精確地稱為木器時代，因為古代狩獵採集者使用的大多數工具都是木製的。

Any reconstruction of the lives of ancient hunter-gatherers from the surviving artefacts is extremely problematic. One of the most glaring differences between the ancient foragers and their agricultural and industrial descendants is that foragers had very few artefacts to begin with, and these played a comparatively modest role in their lives. Over the course of his or her life, a typical member of a modern affluent society will own several million artefacts – from cars and houses to disposable nappies and milk cartons. There’s hardly an activity, a belief, or even an emotion that is not mediated by objects of our own devising. Our eating habits are mediated by a mind-boggling collection of such items, from spoons and glasses to genetic engineering labs and gigantic ocean-going ships. In play, we use a plethora of toys, from plastic cards to 100,000-seater stadiums. Our romantic and sexual relations are accoutred by rings, beds, nice clothes, sexy underwear, condoms, fashionable restaurants, cheap motels, airport lounges, wedding halls and catering companies. Religions bring the sacred into our lives with

Gothic churches, Muslim mosques, Hindu ashrams, Torah scrolls, Tibetan prayer wheels, priestly cassocks, candles, incense, Christmas trees, matzah balls, tombstones and icons.

從遺留下來的文物重建古代狩獵採集者的生活是極具問題性的。古代狩獵採集者和他們的農業與工業後代之間最明顯的區別之一是，狩獵採集者一開始就非常少地擁有文物，而這些文物在他們的生活中扮演了相對較小的角色。在一個現代富裕社會的典型成員的一生中，他或她將擁有幾百萬件文物——從汽車和房屋到用完即棄的尿布和牛奶盒。幾乎沒有一個活動、一個信仰，甚至一種情感是不通過我們自己創造的物品進行媒介的。我們的飲食習慣通過一個令人難以置信的物品收藏進行媒介，從匙羹和玻璃到基因工程實驗室和巨型洋船。在玩耍時，我們使用大量的玩具，從塑料卡片到 10 萬座的體育場。我們的浪漫和性關係是由戒指、床、漂亮的衣服、性感的內衣、避孕套、時尚餐廳、廉價汽車旅館、機場休息室、婚禮廳和餐飲公司裝備的。宗教通過哥特式教堂、穆斯林清真寺、印度教阿什拉姆、托拉卷軸、西藏祈禱輪、教士袍、蠟燭、香，聖誕樹，馬澤瑪圓子，墓碑和聖像將神聖帶入我們的生活中。

We hardly notice how ubiquitous our stuff is until we have to move it to a new house. Foragers moved house every month, every week, and sometimes even every day, toting whatever they had on their backs. There were no moving companies, wagons, or even pack animals to share the burden. They consequently had to make do with only the most essential possessions. It's reasonable to presume, then, that the greater part of their mental, religious and emotional lives was conducted without the help of artefacts. An archaeologist working 100,000 years from now could piece together a reasonable picture of Muslim belief and practice from the myriad objects he unearthed in a ruined mosque. But we are largely at a loss in trying to comprehend the beliefs and rituals of ancient hunter-gatherers. It's much the same dilemma that a future historian would face if he had to depict the social world of twenty-first-century teenagers solely on the basis of their surviving snail mail – since no records will remain of their phone conversations, emails, blogs and text messages.

我們很少注意到我們的物品有多普及，直到我們必須將它們搬到新房子。狩獵採集者每個月、每個星期，甚至有時每天都搬家，背負著他

們所擁有的東西。沒有搬運公司、馬車，甚至也沒有輕裝動物可以分擔負擔。因此，他們只能依靠最基本的財產來過活。因此可以合理地推斷，他們大部分的心理、宗教和情感生活是在沒有文物的幫助下進行的。一位在100,000年後工作的考古學家，可以從一座荒廢的清真寺裡發掘的無數物品中拼湊出穆斯林信仰和實踐的合理圖像。但如果他必須仅仅基于他們残存的物品，描绘21世纪青少年的社交世界，那么未来的历史学家将面临同样的困境——因为没有电话交谈、电子邮件、博客和短信的记录将留下来。

A reliance on artefacts will thus bias an account of ancient hunter-gatherer life. One way to remedy this is to look at modern forager societies. These can be studied directly, by anthropological observation. But there are good reasons to be very careful in extrapolating from modern forager societies to ancient ones.

Firstly, all forager societies that have survived into the modern era have been influenced by neighbouring agricultural and industrial societies. Consequently, it's risky to assume that what is true of them was also true tens of thousands of years ago.

Secondly, modern forager societies have survived mainly in areas with difficult climatic conditions and inhospitable terrain, ill-suited for agriculture. Societies that have adapted to the extreme conditions of places such as the Kalahari Desert in southern Africa may well provide a very misleading model for understanding ancient societies in fertile areas such as the Yangtze River Valley. In particular, population density in an area like the Kalahari Desert is far lower than it was around the ancient Yangtze, and this has far-reaching implications for key questions about the size and structure of human bands and the relations between them.

過度依賴文物將導致對古代狩獵採集社會的描述偏見。解決這個問題的一種方法是觀察現代的採獵社會。人類學觀察可以直接研究這些社會。但是，從現代的採獵社會推斷古代社會有很多風險。首先，存活到現代的所有採獵社會都受到了周圍農業和工業社會的影響。因此，假設現代採獵者的情況也適用於數萬年前是危險的。其次，現代的採獵社會主要在氣候惡劣且地形不宜農業的地區生存下來。適應如南非卡拉哈里沙漠等極端環境的社會很可能為理解豐沃地區如長江流域的

古代社會提供非常誤導的模型。特別是，像卡拉哈里沙漠這樣的地區的人口密度要比古代長江周圍的地區低得多，這對於關鍵問題，如人類團體的大小和結構以及它們之間的關係具有深遠的影響。

Thirdly, the most notable characteristic of hunter-gatherer societies is how different they are one from the other. They differ not only from one part of the world to another but even in the same region. One good example is the huge variety the first European settlers found among the Aborigine peoples of Australia. Just before the British conquest, between 300,000 and 700,000 hunter-gatherers lived on the continent in 200–600 tribes, each of which was further divided into several bands.² Each tribe had its own language, religion, norms and customs. Living around what is now Adelaide in southern Australia were several patrilineal clans that reckoned descent from the father's side. These clans bonded together into tribes on a strictly territorial basis. In contrast, some tribes in northern Australia gave more importance to a person's maternal ancestry, and a person's tribal identity depended on his or her totem rather than his territory.

第三，獵人採集社會最引人注目的特點是它們彼此之間的差異性。它們不僅在世界各地有差異，甚至在同一地區也有差異。一個很好的例子是第一批歐洲殖民者在澳大利亞原住民中發現的巨大多樣性。在英國征服之前，大約有30萬到70萬名獵人採集者生活在大陸上，分佈在200到600個部落中，每個部落又進一步分為幾個族群。每個部落都有自己的語言、宗教、規範和習俗。在現在的南澳大利亞的阿德萊德周圍居住著若干由父系親屬關係為標準的氏族。這些氏族在嚴格的領土基礎上聚合成部落。相反，北部某些部落更注重一個人的母系親屬關係，一個人的部落身份取決於他的圖騰而不是他的領土。

It stands to reason that the ethnic and cultural variety among ancient hunter-gatherers was equally impressive, and that the 5 million to 8 million foragers who populated the world on the eve of the Agricultural Revolution were divided into thousands of separate tribes with thousands of different languages and cultures.³ This, after all, was one of the main legacies of the Cognitive Revolution. Thanks to the appearance of fiction, even people with the same genetic make-up who lived under similar ecological conditions were able to create very different imagined realities, which manifested themselves in different norms and values.

For example, there's every reason to believe that a forager band that lived 30,000 years ago on the spot where Oxford University now stands would have spoken a different language from one living where Cambridge is now situated. One band might have been belligerent and the other peaceful. Perhaps the Cambridge band was communal while the one at Oxford was based on nuclear families. The Cantabrigians might have spent long hours carving wooden statues of their guardian spirits, whereas the Oxonians may have worshipped through dance. The former perhaps believed in reincarnation, while the latter thought this was nonsense. In one society, homosexual relationships might have been accepted, while in the other they were taboo.

古代狩獵採集者種族和文化的多樣性同樣令人印象深刻。在農業革命前夕，世界上有五百萬至八百萬的採集者被分成數千個不同語言和文化的部落。這是認知革命的主要傳承之一。由於虛構的出現，即使遺傳結構相同且生活在類似的生態條件下的人，也能創造出非常不同的想像現實，這表現為不同的規範和價值觀。例如，有理由相信，3萬年前居住在牛津大學現在所在地的狩獵者群會說一種不同於居住在現在劍橋所在地的人群的語言。其中一部落可能好戰，另一部落可能和平。也許在劍橋的群體是共同體，而牛津的群體基於核心家庭。Cantabrigians可能花費很長的時間雕刻他們的保護神的木雕像，而Oxonians則通過舞蹈崇拜。前者可能相信轉世，而後者認為這是胡說。在一個社會中，同性戀關係可能被接受，而在另一個社會中則被視為禁忌。

In other words, while anthropological observations of modern foragers can help us understand some of the possibilities available to ancient foragers, the ancient horizon of possibilities was much broader, and most of it is hidden from our view. ^{*}The heated debates about *Homo sapiens* ' 'natural way of life' miss the main point. Ever since the Cognitive Revolution, there hasn't been a single natural way of life for Sapiens. There are only cultural choices, from among a bewildering palette of possibilities.

The Original Affluent Society

What generalisations can we make about life in the pre-agricultural world nevertheless? It seems safe to say that the vast majority of people lived in small bands numbering several dozen or at most several hundred individuals, and that all these individuals were humans. It is important to note this last point, because it is far from obvious. Most members of agricultural and industrial societies are domesticated animals. They are not equal to their masters, of course, but they are members all the same. Today, the society called New Zealand is composed of 4.5 million Sapiens and 50 million sheep.

換句話說，雖然現代狩獵採集者的人類學觀察可以幫助我們理解古代狩獵採集者所擁有的一些可能性，但是古代的可能性遠遠廣泛，而且大部分我們並不清楚。關於智人的“自然生活方式”的激烈辯論忽略了主要問題。自認知革命以來，智人再也沒有一種自然生活方式。只有文化選擇，來自眾多可能性的令人眼花繚亂的選擇。儘管如此，在農業出現之前的世界里，我們可以得出什麼一般性的結論呢？似乎可以肯定地說，絕大多數人生活在由幾十到幾百人組成的小團體中，所有這些人都是人類。需要注意的是，這一點遠非明顯。大多數農業和工業社會的成員都是家畜。他們當然不與主人平等，但他們仍然是成員。今天，所謂的新西蘭社會由450萬智人和5000萬頭羊組成。

There was just one exception to this general rule: the dog. The dog was the first animal domesticated by *Homo sapiens*, and this occurred *before* the Agricultural Revolution. Experts disagree about the exact date, but we have incontrovertible evidence of domesticated dogs from about 15,000 years ago. They may have joined the human pack thousands of years earlier.

Dogs were used for hunting and fighting, and as an alarm system against wild beasts and human intruders. With the passing of generations, the two species co-evolved to communicate well with each other. Dogs that were most attentive to the needs and feelings of their human companions got extra care and food, and were more likely to survive. Simultaneously, dogs learned to manipulate people for their own needs. A 15,000-year bond has yielded a much deeper understanding and affection between humans and dogs than between humans and any other animal.⁴ In some cases dead dogs were even buried ceremoniously, much like humans.

這個一般規則只有一個例外：狗。狗是人類馴養的第一種動物，這是在農業革命之前發生的。專家們對確切的日期有不同意見，但我們有明確的證據表明，距今約15,000年前就已經有了馴化的狗。它們可能比人類早數千年加入了人類的群體。狗被用於狩獵和戰鬥，並作為野獸和入侵者的警報系統。隨著世代的交替，這兩種物種共同進化，能夠良好地相互交流。對人類伴侶的需求和感受最為細心的狗得到了額外的照顧和食物，並且更有可能生存下來。同時，狗學會了為自己的需要操縱人類。一個15,000年的約定產生了人類和狗之間比任何其他動物更深刻的理解和情感。在某些情況下，甚至會像人類一樣隆重地埋葬死去的狗。

Members of a band knew each other very intimately, and were surrounded throughout their lives by friends and relatives. Loneliness and privacy were rare. Neighbouring bands probably competed for resources and even fought one another, but they also had friendly contacts. They exchanged members, hunted together, traded rare luxuries, cemented political alliances and celebrated religious festivals. Such cooperation was one of the important trademarks of *Homo sapiens*, and gave it a crucial edge over other human species. Sometimes relations with neighbouring bands were tight enough that together they constituted a single tribe, sharing a common language, common myths, and common norms and values.

Yet we should not overestimate the importance of such external relations. Even if in times of crisis neighbouring bands drew closer together, and even if they occasionally gathered to hunt or feast together, they still spent the vast majority of their time in complete isolation and independence. Trade was mostly limited to prestige items such as shells, amber and pigments. There is no evidence that people traded staple goods like fruits and meat, or that the existence of one band depended on the importing of goods from another. Sociopolitical relations, too, tended to be sporadic. The tribe did not serve as a permanent political framework, and even if it had seasonal meeting places, there were no permanent towns or institutions. The average person lived many months without seeing or hearing a human from outside of her own band, and she encountered throughout her life no more than a few hundred humans. The Sapiens population was thinly spread over vast territories. Before the Agricultural Revolution, the human population of the entire planet was smaller than that of today's Cairo.

樂團成員之間關係密切，終其一生都被朋友和親戚包圍，很少感到孤獨和隱私。鄰近的樂團可能會爭奪資源，甚至打架，但它們也保持友好的聯繫。它們交換成員，一起打獵，交易珍稀的奢侈品，巩固政治聯盟，慶祝宗教節日。这样的合作是智人的重要標誌之一，使它在其他人類物种中具有重要优势。有时，与邻近的樂團的关系紧密到足以构成一个共同语言、共同神话、共同规范和价值观的部落。然而，我们不应过分高估这种外部关系的重要性。即使在危机时期，邻近的樂團也会走得更近，偶尔一起打猎或享用美食，但它们仍然大部分时间都是处于完全孤立和独立状态之下。交易大多限于贝壳、琥珀和颜料等有名望的物品。没有证据表明人们交易水果和肉类等主食，也没有证据表明一个群体的存在依赖于从另一个群体进口物品。社会政治关系也往往是零散的。部落不是一个永久的政治框架，即使它有季节性的聚会场所，也没有永久的城镇或机构。普通人可以几个月没有看到或听到来自自己队伍之外的人，而且她在一生中遇到的人不超过几百人。在农业革命之前，全球人口比现在的开罗还要少。

The Upper Galilee Museum of Prehistory



7. **First pet? A 12,000-year-old tomb found in northern Israel. It contains the skeleton of a fifty-year-old woman next to that of a puppy (bottom left corner). The puppy was buried close to the woman's head. Her left hand is resting on the dog in a way that might indicate an emotional connection. There are, of course, other possible explanations. Perhaps, for example, the puppy was a gift to the gatekeeper of the next world .**

Most Sapiens bands lived on the road, roaming from place to place in search of food. Their movements were influenced by the changing seasons, the annual migrations of animals and the growth cycles of plants. They usually travelled back and forth across the same home territory, an area of between several dozen and many hundreds of square kilometres.

7. 第一隻寵物？在以色列北部發現了一個有12,000年歷史的墳墓，其中包含一名50歲女性的骸骨和一只幼犬（在左下角）。幼犬被埋在女性的頭旁。她的左手以一種可能表明情感聯繫的方式放在狗身上。當然，還有其他可能的解釋。例如，這只幼犬可能是下一個世界的門衛的禮物。大多數智人部落都是在路上生活，漫遊各地尋找食物。他們的移動受到季節的變化、動物的年度遷徙和植物的生長週期的影響。他們通常在同一個家庭領地內往返旅行，其範圍為數十到數百平方公里之間。

Occasionally, bands wandered outside their turf and explored new lands, whether due to natural calamities, violent conflicts, demographic pressures or the initiative of a charismatic leader. These wanderings were the engine of human worldwide expansion. If a forager band split once every forty years and its splinter group migrated to a new territory a hundred kilometres to the east, the distance from East Africa to China would have been covered in about 10,000 years.

In some exceptional cases, when food sources were particularly rich, bands settled down in seasonal and even permanent camps. Techniques for drying, smoking and freezing food also made it possible to stay put for longer periods. Most importantly, alongside seas and rivers rich in seafood and waterfowl, humans set up permanent fishing villages – the first permanent settlements in history, long predating the Agricultural Revolution. Fishing villages might have appeared on the coasts of Indonesian islands as early as 45,000 years ago. These may have been the base from which *Homo sapiens* launched its first transoceanic enterprise: the invasion of Australia.

偶爾，樂隊會走出自己的領地，探索新的土地，不管是因為自然災害、暴力衝突、人口壓力或是有個有魅力的領袖。這些漫遊是人類全球擴張的引擎。如果每隔四十年有一個採集者團體分裂，並且分裂出的小團體遷移到東邊一百公里的新領土，從東非到中國的距離大約需

要一萬年。在一些特殊的情況下，如果食物來源特別豐富，團體會在季節性或甚至是永久性營地安落下來。晾乾、煙燻和冷凍食物的技術也使得人們可以停留更長的時間。最重要的是，在豐富海產和水禽的河流和海岸邊，人們設立了永久漁村——作為人類歷史上第一批永久定居點，早在農業革命之前就已經存在。可能早在四萬五千年前，漁村就已經出現在印尼島嶼的海岸上。這些漁村可能是智人發動其首次橫越海洋的企業——入侵澳大利亞——的基地。

In most habitats, *Sapiens* bands fed themselves in an elastic and opportunistic fashion. They scrounged for termites, picked berries, dug for roots, stalked rabbits and hunted bison and mammoth. Notwithstanding the popular image of ‘man the hunter’, gathering was *Sapiens*’ main activity, and it provided most of their calories, as well as raw materials such as flint, wood and bamboo.

Sapiens did not forage only for food and materials. They foraged for knowledge as well. To survive, they needed a detailed mental map of their territory. To maximise the efficiency of their daily search for food, they required information about the growth patterns of each plant and the habits of each animal. They needed to know which foods were nourishing, which made you sick, and how to use others as cures. They needed to know the progress of the seasons and what warning signs preceded a thunderstorm or a dry spell. They studied every stream, every walnut tree, every bear cave, and every flint-stone deposit in their vicinity. Each individual had to understand how to make a stone knife, how to mend a torn cloak, how to lay a rabbit trap, and how to face avalanches, snakebites or hungry lions. Mastery of each of these many skills required years of apprenticeship and practice. The average ancient forager could turn a flint stone into a spear point within minutes. When we try to imitate this feat, we usually fail miserably. Most of us lack expert knowledge of the flaking properties of flint and basalt and the fine motor skills needed to work them precisely.

在大多數棲息地中，智人部落以一種靈活且機會主義的方式為自己提供食物。他們會搜索白蟻，採摘漿果，挖掘根部，追蹤兔子，狩獵野牛和貓象。儘管有“狩獵者人類”的流行形象，但採集是智人的主要活動，它提供了他們大部分的卡路里以及原材料，如燧石、木材和竹子。智人不僅收集食物和材料。他們也收集知識。為了生存，他們需

要詳細的領土地圖。為了最大程度地提高每日尋找食物的效率，他們需要了解每種植物的生長模式和每種動物的習性。他們需要知道哪些食物有營養，哪些會使你生病，以及如何使用其他食物作為治療方法。他們需要知道季節的進展以及雷暴或干旱前兆的警告信號。他們研究他們周圍的每條小溪，每棵胡桃樹，每個熊洞和每個燧石礦床。每個人都必須了解如何製作石刀，如何修補破爛斗篷，如何設置兔子陷阱以及如何面對雪崩、蛇咬或飢餓的獅子。掌握這些許多技能中的每一個都需要多年的學徒和實踐。普通的古代採集者可以在幾分鐘內把燧石磨成一個矛尖。當我們試圖模仿這一壯舉時，我們通常會失敗。我們大多數人缺乏對燧石和玄武岩屑石的剝片特性的專門知識以及需要精確操作所需的細微運動技能。

In other words, the average forager had wider, deeper and more varied knowledge of her immediate surroundings than most of her modern descendants. Today, most people in industrial societies don't need to know much about the natural world in order to survive. What do you really need to know in order to get by as a computer engineer, an insurance agent, a history teacher or a factory worker? You need to know a lot about your own tiny field of expertise, but for the vast majority of life's necessities you rely blindly on the help of other experts, whose own knowledge is also limited to a tiny field of expertise. The human collective knows far more today than did the ancient bands. But at the individual level, ancient foragers were the most knowledgeable and skilful people in history.

換句話說，平均而言，狩獵採集者對身邊的環境有著更廣泛、更深刻和更多變的知識，而這些知識對於現代的後代來說並不那麼重要。今天，在工業社會中，大多數人並不需要為了生存而對自然世界有很多了解。作為一名電腦工程師、保險代理人、歷史老師或工廠工人，您真正需要了解什麼？您需要對自己的專業領域有很多了解，但對於大多數生活必需品，您也盲目地依賴其他專家的幫助，而這些專家的知識也僅限於一個小領域。如今，人類的集體知識遠遠超過了古代的部落。但在個人層面上，古代的狩獵採集者是歷史上最有知識和技能的人。

There is some evidence that the size of the average Sapiens brain has actually *decreased* since the age of foraging.⁵ Survival in that era required

superb mental abilities from everyone. When agriculture and industry came along people could increasingly rely on the skills of others for survival, and new ‘niches for imbeciles’ were opened up. You could survive and pass your unremarkable genes to the next generation by working as a water carrier or an assembly-line worker.

Foragers mastered not only the surrounding world of animals, plants and objects, but also the internal world of their own bodies and senses. They listened to the slightest movement in the grass to learn whether a snake might be lurking there. They carefully observed the foliage of trees in order to discover fruits, beehives and bird nests. They moved with a minimum of effort and noise, and knew how to sit, walk and run in the most agile and efficient manner. Varied and constant use of their bodies made them as fit as marathon runners. They had physical dexterity that people today are unable to achieve even after years of practising yoga or t'ai chi.

有些證據顯示，現代智人（Sapiens）平均腦部大小比採集時期更小。⁵在那個時代，每個人都需要出色的心智能力才能生存。當農業和工業出現時，人們可以越來越依靠他人的技能來生存，為愚笨的人開啟了新的“白癡專屬市場”。你可以通過擔任水夫或組裝線工人工作來生存，並將不引人注目的基因傳遞給下一代。採集者不僅掌握了動物、植物和物體的周圍世界，還掌握了自己身體和感官的內在世界。他們聆聽草叢中微小的移動聲，以了解是否有蛇潛在那裡。他們仔細觀察樹葉，以發現水果、蜜蜂窩和鳥巢。他們行動靈活、輕盈無聲，懂得如何在最靈活和有效的方式下坐、走、奔跑。多種多樣和持續的身體使用使他們像馬拉松運動員一樣健康。他們擁有今天的人無法在練習瑜伽或太極拳多年後取得的身體靈活性。

The hunter-gatherer way of life differed significantly from region to region and from season to season, but on the whole foragers seem to have enjoyed a more comfortable and rewarding lifestyle than most of the peasants, shepherds, labourers and office clerks who followed in their footsteps.

While people in today's affluent societies work an average of forty to forty-five hours a week, and people in the developing world work sixty and even eighty hours a week, hunter-gatherers living today in the most inhospitable of habitats – such as the Kalahari Desert work on average for just thirty-five to

forty-five hours a week. They hunt only one day out of three, and gathering takes up just three to six hours daily. In normal times, this is enough to feed the band. It may well be that ancient hunter-gatherers living in zones more fertile than the Kalahari spent even less time obtaining food and raw materials. On top of that, foragers enjoyed a lighter load of household chores. They had no dishes to wash, no carpets to vacuum, no floors to polish, no nappies to change and no bills to pay.

狩獵採集的生活方式因地區和季節而有所不同，但整體而言，相對於許多農民、牧羊人、勞動者和辦公室職員，採集者似乎擁有更舒適和有益的生活方式。在今天富裕社會，人們平均每週工作40至45小時，而發展中國家的人們每週工作60至80小時，而如今在最荒涼的環境中生活的狩獵採集者，如卡拉哈裏沙漠的人們，平均只需工作35至45小時。他們只狩獵三天中的一天，收集只佔每天三至六小時。在正常情況下，這已足夠餵養族群。很可能古代狩獵採集者生活在比卡拉哈裏更肥沃的區域要花費更少的時間獲取食物和原材料。此外，採集者還能夠輕鬆完成家務。他們沒有要洗的碗，沒有要吸塵的地毯，沒有要擦拭的地板，沒有要換的尿布，也沒有要支付的帳單。

The forager economy provided most people with more interesting lives than agriculture or industry do. Today, a Chinese factory hand leaves home around seven in the morning, makes her way through polluted streets to a sweatshop, and there operates the same machine, in the same way, day in, day out, for ten long and mind-numbing hours, returning home around seven in the evening in order to wash dishes and do the laundry. Thirty thousand years ago, a Chinese forager might leave camp with her companions at, say, eight in the morning. They'd roam the nearby forests and meadows, gathering mushrooms, digging up edible roots, catching frogs and occasionally running away from tigers. By early afternoon, they were back at the camp to make lunch. That left them plenty of time to gossip, tell stories, play with the children and just hang out. Of course the tigers sometimes caught them, or a snake bit them, but on the other hand they didn't have to deal with automobile accidents and industrial pollution.

狩獵採集經濟讓大多數人擁有比農業或工業更有趣的生活。今天，一個中國工廠工人大約早上七點離開家，穿過污染的街道到達汗店，並在那裡操作同一臺機器，每天長達十個乏味的小時，晚上七點左右回

家洗碗和洗衣。三萬年前，一個中國的狩獵採集者可能和她的同伴在早上八點左右離開野營。他們會在附近的森林和草地漫步，採集蘑菇，挖可食用的根，捕捉青蛙，有時還要躲避老虎。下午早些時候，他們回到營地享用午餐。這給他們留下了大量的時間聊天，講故事，和孩子玩。當然，老虎有時會抓住他們，或者被蛇咬傷，但另一方面，他們不用擔心汽車事故和工業污染。

In most places and at most times, foraging provided ideal nutrition. That is hardly surprising – this had been the human diet for hundreds of thousands of years, and the human body was well adapted to it. Evidence from fossilised skeletons indicates that ancient foragers were less likely to suffer from starvation or malnutrition, and were generally taller and healthier than their peasant descendants. Average life expectancy was apparently just thirty to forty years, but this was due largely to the high incidence of child mortality. Children who made it through the perilous first years had a good chance of reaching the age of sixty, and some even made it to their eighties. Among modern foragers, forty-five-year-old women can expect to live another twenty years, and about 5–8 per cent of the population is over sixty.⁶

在大多數地方和大多數時間裡，覓食提供了理想的營養。這並不奇怪-這已經是人類數十萬年的飲食方式，人體也很適應。化石骨骼的證據表明，古代的覓食者很少遭受饑餓或營養不良，身材也比他們的農民後代要高大和健康。平均壽命似乎只有三十到四十歲，但這主要是由於兒童死亡率高。經過危險的頭幾年後存活下來的兒童有很好的機會活到六十歲，有些甚至活到八十歲。在現代的覓食者中，45歲的女性可以期望再活二十年，約有5-8%的人口年齡超過60歲。

The foragers' secret of success, which protected them from starvation and malnutrition, was their varied diet. Farmers tend to eat a very limited and unbalanced diet. Especially in premodern times, most of the calories feeding an agricultural population came from a single crop – such as wheat, potatoes or rice – that lacks some of the vitamins, minerals and other nutritional materials humans need. The typical peasant in traditional China ate rice for breakfast, rice for lunch, and rice for dinner. If she were lucky, she could expect to eat the same on the following day. By contrast, ancient foragers regularly ate dozens of different foodstuffs. The peasant's ancient ancestor, the forager, may have eaten berries and mushrooms for breakfast; fruits,

snails and turtle for lunch; and rabbit steak with wild onions for dinner. Tomorrows menu might have been completely different. This variety ensured that the ancient foragers received all the necessary nutrients.

獵人成功的秘訣，能讓他們避免饑餓和營養不良，就是吃多樣化的食物。農民往往吃的食種類非常有限而且營養不均衡。特別是在現代之前的時代，大多數糧食的卡路里都是由單一的作物一如小麥、馬鈴薯或米飯—提供，缺乏了人體所需的一些維他命、礦物質和其他營養物質。傳統中國的典型農民早餐、午餐和晚餐都吃米飯。如果她幸運的話，可以指望第二天能吃到一樣的東西。相比之下，遠古獵人經常會吃數十種不同食物。農民的古代祖先—獵人，早餐有可能吃漿果和蘑菇，午餐吃水果、蝸牛和烏龜，晚餐有野兔肉和野蔥。明天的菜譜可能完全不一樣。這樣的多樣性確保了遠古獵人得到了所有必要的營養素。

Furthermore, by not being dependent on any single kind of food, they were less liable to suffer when one particular food source failed. Agricultural societies are ravaged by famine when drought, fire or earthquake devastates the annual rice or potato crop. Forager societies were hardly immune to natural disasters, and suffered from periods of want and hunger, but they were usually able to deal with such calamities more easily. If they lost some of their staple foodstuffs, they could gather or hunt other species, or move to a less affected area.

Ancient foragers also suffered less from infectious diseases. Most of the infectious diseases that have plagued agricultural and industrial societies (such as smallpox, measles and tuberculosis) originated in domesticated animals and were transferred to humans only after the Agricultural Revolution. Ancient foragers, who had domesticated only dogs, were free of these scourges. Moreover, most people in agricultural and industrial societies lived in dense, unhygienic permanent settlements – ideal hotbeds for disease. Foragers roamed the land in small bands that could not sustain epidemics.

此外，由於不依賴於單一類型的食物，他們在特定食物供應損失時較不易受到影響。當旱災、火災或地震摧毀年度稻米或馬鈴薯作物時，農業社會就會遭受饑荒的蹂躪。尋找者社會雖然也沒有免於自然災害

的影響，也會遭受不足和飢荒的時期，但通常能夠更輕鬆地應對此類災難。如果他們失去了某些主食，他們可以收集或狩獵其他物種，或者移居到影響較小的地區。古代的採集者也不太容易感染傳染病。大部分危害農業和工業社會的傳染病（如天花、麻疹和肺結核）源於馴養的動物，在農業革命之後才傳染給人類。只馴養了狗的古代採集者免於這些災難。此外，農業和工業社會中大部分的人生活在濃密、不衛生的永久聚居地 - 是疾病的理想溫床。採集者在小型團隊中漫遊，無法維持疫情的傳播。

The wholesome and varied diet, the relatively short working week, and the rarity of infectious diseases have led many experts to define pre-agricultural forager societies as 'the original affluent societies'. It would be a mistake, however, to idealise the lives of these ancients. Though they lived better lives than most people in agricultural and industrial societies, their world could still be harsh and unforgiving. Periods of want and hardship were not uncommon, child mortality was high, and an accident which would be minor today could easily become a death sentence. Most people probably enjoyed the close intimacy of the roaming band, but those unfortunates who incurred the hostility or mockery of their fellow band members probably suffered terribly. Modern foragers occasionally abandon and even kill old or disabled people who cannot keep up with the band. Unwanted babies and children may be slain, and there are even cases of religiously inspired human sacrifice.

與綜合均衡的飲食、相對短的工作周以及疾病的罕見有許多專家將農業前的狩獵採集社會定義為“原始的富裕社會”。然而，理想化這些古人的生活便是一個錯誤。雖然他們的生活比大多數農業和工業社會的人更好，但他們的世界仍然可以是殘酷和無情的。短缺和困難時期並不罕見，兒童死亡率高，而今天微不足道的意外可能會輕易變成死刑。大多數人可能享受到流浪者團隊的密切接觸，但那些招致同伴敵意或嘲笑的不幸者可能會遭受嚴重的折磨。現代的狩獵採集者有時會放棄甚至殺死不能跟上團隊的老人或殘障人士。不需要的嬰兒和兒童可能會被殺害，甚至還有宗教鼓舞的人類犧牲情況。

The Aché people, hunter-gatherers who lived in the jungles of Paraguay until the 1960s, offer a glimpse into the darker side of foraging. When a valued band member died, the Aché customarily killed a little girl and buried the

two together. Anthropologists who interviewed the Aché recorded a case in which a band abandoned a middle-aged man who fell sick and was unable to keep up with the others. He was left under a tree. Vultures perched above him, expecting a hearty meal. But the man recuperated, and, walking briskly, he managed to rejoin the band. His body was covered with the birds' faeces, so he was henceforth nicknamed 'Vulture Droppings'.

When an old Aché woman became a burden to the rest of the band, one of the younger men would sneak behind her and kill her with an axe-blow to the head. An Aché man told the inquisitive anthropologists stories of his prime years in the jungle. 'I customarily killed old women. I used to kill my aunts ... The women were afraid of me ... Now, here with the whites, I have become weak.' Babies born without hair, who were considered underdeveloped, were killed immediately. One woman recalled that her first baby girl was killed because the men in the band did not want another girl. On another occasion a man killed a small boy because he was 'in a bad mood and the child was crying'. Another child was buried alive because 'it was funny-looking and the other children laughed at it'. [7](#)

阿切人民是一群居住在巴拉圭叢林中、從事狩獵採集的部落，直到20世紀60年代才與現代文明接觸。他們的習俗顯示了採集社會的不足之處。當一名重要的部落成員去世時，阿切人民通常會殺一名小女孩，然後將其與死者一同埋葬。人類學家曾訪問過阿切人民，記錄了一起故事：一個部落中一名中年男子生病了，跟不上其他人的步伐，最終被放棄在一棵樹下。禿鷲在他上方盤旋，等待著美餐。但這名男子沒有死，反而痊愈了，他快步走著，成功追上了隊伍，身上被鳥糞覆蓋，從此被稱為「禿鷲糞便」。當阿切人民中的老婦成為部落負擔時，年輕人會悄悄接近她，用斧頭砍死她。一名阿切人告訴好奇的人類學家自己曾是叢林中的一名獵人，「我經常殺老婦，還殺過我的姨媽.....女人們都害怕我.....現在，在白人那裡，我變得軟弱了。」沒有毛髮的嬰兒被認為是未發育完全，會立即被殺死。一位女性回憶起，她的第一個女兒被殺了，因為男人不想再要一個女孩。另外一次，一名男子因為心情不好，孩子哭了，就殺了這個小男孩。還有一個孩子被活埋了，因為「長得奇怪，其他孩子都笑他」。

We should be careful, though, not to judge the Aché too quickly. Anthropologists who lived with them for years report that violence between

adults was very rare. Both women and men were free to change partners at will. They smiled and laughed constantly, had no leadership hierarchy, and generally shunned domineering people. They were extremely generous with their few possessions, and were not obsessed with success or wealth. The things they valued most in life were good social interactions and high-quality friendships.⁸ They viewed the killing of children, sick people and the elderly as many people today view abortion and euthanasia. It should also be noted that the Aché were hunted and killed without mercy by Paraguayan farmers. The need to evade their enemies probably caused the Aché to adopt an exceptionally harsh attitude towards anyone who might become a liability to the band.

然而，我們應該小心，不要太快就為阿切人下定論。曾與他們一起生活多年的人類學家報告，成年人之間的暴力非常罕見。女性和男性都可以自由地更換伴侶。他們經常微笑和笑，沒有領導層次，並普遍避開霸道的人。他們非常慷慨，擁有僅有的財產，而且並不著迷於成功或財富。他們生命中最重要的是良好的社交互動和高質量的友誼。他們把殺害兒童、病人和老年人看作是現今許多人對待墮胎和安樂死的態度。此外，值得注意的是，阿切人遭到巴拉圭農民的無情獵殺。需要逃避敵人可能導致阿切人對可能成為團隊負擔的人採取特別嚴厲的態度。

The truth is that Aché society, like every human society, was very complex. We should beware of demonising or idealising it on the basis of a superficial acquaintance. The Aché were neither angels nor fiends – they were humans. So, too, were the ancient hunter-gatherers.

Talking Ghosts

What can we say about the spiritual and mental life of the ancient hunter-gatherers? The basics of the forager economy can be reconstructed with some confidence based on quantifiable and objective factors. For example, we can calculate how many calories per day a person needed in order to survive, how many calories were obtained from a kilogram of walnuts, and how many walnuts could be gathered from a square kilometre of forest. With this data,

we can make an educated guess about the relative importance of walnuts in their diet.

事實上，阿切社會與每個人類社會一樣，都非常複雜。我們應留意，不要根據表面的認識來妖魔化或理想化它。阿切人既不是天使也不是魔鬼-他們是人。古代的狩獵採集者也是如此。關於古代狩獵採集者的精神和精神生活，我們能說些什麼？基礎的狩獵採集經濟可以根據可量化和客觀的因素得出比較有把握的重建。例如，我們可以計算一個人每天需要多少熱量才能生存，一公斤核桃中含有多少熱量，以及從一平方公里的森林中可以收集多少核桃。有了這些數據，我們就可以對核桃在他們的飲食中的相對重要性有所了解。

But did they consider walnuts a delicacy or a humdrum staple? Did they believe that walnut trees were inhabited by spirits? Did they find walnut leaves pretty? If a forager boy wanted to take a forager girl to a romantic spot, did the shade of a walnut tree suffice? The world of thought, belief and feeling is by definition far more difficult to decipher.

Most scholars agree that animistic beliefs were common among ancient foragers. Animism (from ‘*anima*’, ‘soul’ or ‘spirit’ in Latin) is the belief that almost every place, every animal, every plant and every natural phenomenon has awareness and feelings, and can communicate directly with humans. Thus, animists may believe that the big rock at the top of the hill has desires and needs. The rock might be angry about something that people did and rejoice over some other action. The rock might admonish people or ask for favours. Humans, for their part, can address the rock, to mollify or threaten it. Not only the rock, but also the oak tree at the bottom of the hill is an animated being, and so is the stream flowing below the hill, the spring in the forest clearing, the bushes growing around it, the path to the clearing, and the field mice, wolves and crows that drink there. In the animist world, objects and living things are not the only animated beings. There are also immaterial entities – the spirits of the dead, and friendly and malevolent beings, the kind that we today call demons, fairies and angels.

他們是否認為核桃是豐盛的美食還是平凡而普通的主食？他們是否相信核桃樹上有靈魂居住？他們是否覺得核桃樹的葉子漂亮？如果一個採集男孩想帶一個採集女孩去一個浪漫的地方，核桃樹下的陰影是否

足夠？思想、信仰和情感世界的解讀定義上要困難得多。大多數學者認為，動物崇拜的信仰在古代採集者中很普遍。動物崇拜（源自拉丁語的“anima”，意為靈魂或精神）是一種信仰，認為幾乎每個地方、每只動物、每棵植物和每種自然現象都有意識和感覺，能夠直接與人類溝通。因此，動物崇拜者可能相信山頂上的大石頭具有欲望和需求。這塊石頭可能因為人們做了些什麼事而生氣，並因某些其他行動而歡欣鼓舞。這塊石頭可能勸告人們或要求幫助。同樣的，人類也可以對這塊石頭進行交流，以平息或威脅它。不僅是石頭，山腳下的橡樹也是一種有生命力的存在，流淌在山下的小溪、森林空地上的泉水、周圍生長的灌木叢、通往空地的小路，以及飲水的田鼠、狼和烏鵲都是活生生的生物。在動物崇拜的世界裡，物體和生物不是唯一有生命的存在。還有非物質實體——死者的靈魂以及友好和惡意的存在，就像我們今天所謂的惡魔、仙女和天使。

Animists believe that there is no barrier between humans and other beings. They can all communicate directly through speech, song, dance and ceremony. A hunter may address a herd of deer and ask that one of them sacrifice itself. If the hunt succeeds, the hunter may ask the dead animal to forgive him. When someone falls sick, a shaman can contact the spirit that caused the sickness and try to pacify it or scare it away. If need be, the shaman may ask for help from other spirits. What characterises all these acts of communication is that the entities being addressed are local beings. They are not universal gods, but rather a particular deer, a particular tree, a particular stream, a particular ghost.

Just as there is no barrier between humans and other beings, neither is there a strict hierarchy. Non-human entities do not exist merely to provide for the needs of man. Nor are they all-powerful gods who run the world as they wish. The world does not revolve around humans or around any other particular group of beings.

萬物信奉者相信人類和其他生物之間沒有阻礙。他們可以通過言語、歌舞和儀式直接溝通。獵人可以向一群鹿提出要求其中一隻犧牲。如果狩獵成功，獵人可能會請死去的動物原諒他。當人生病時，巫師可以聯繫引起疾病的精靈，嘗試撫平或驅逐它。必要時，巫師可以請求其他精靈的幫助。所有這些溝通行為的特點是被請求的實體都是當地存在的實體。它們不是普遍存在的神，而是一隻特定的鹿，一棵特定

的樹，一條特定的溪流，或一個特定的鬼魂。正如人們和其他生物之間沒有障礙一樣，也沒有嚴格的等級制度。非人類實體不僅存在於為人類需求提供服務。它們也不是掌控世界的全能神。世界並不圍繞人類或其他特定的生物群體運轉。

Animism is not a specific religion. It is a generic name for thousands of very different religions, cults and beliefs. What makes all of them ‘animist’ is this common approach to the world and to man’s place in it. Saying that ancient foragers were probably animists is like saying that premodern agriculturists were mostly theists. Theism (from ‘*theos*’, ‘god’ in Greek) is the view that the universal order is based on a hierarchical relationship between humans and a small group of ethereal entities called gods. It is certainly true to say that premodern agriculturists tended to be theists, but it does not teach us much about the particulars. The generic rubric ‘theists’ covers Jewish rabbis from eighteenth-century Poland, witch-burning Puritans from seventeenth-century Massachusetts, Aztec priests from fifteenth-century Mexico, Sufi mystics from twelfth-century Iran, tenth-century Viking warriors, second-century Roman legionnaires, and first-century Chinese bureaucrats. Each of these viewed the others’ beliefs and practices as weird and heretical. The differences between the beliefs and practices of groups of ‘animistic’ foragers were probably just as big. Their religious experience may have been turbulent and filled with controversies, reforms and revolutions.

萬物有靈論不是一個特定的宗教。它是成千上萬種非常不同的宗教、教派和信仰的總稱。使它們「萬物有靈」的是對世界和人類在其中的地位的共同看法。說古代的狩獵採集者可能是萬物有靈論者就像說古代農耕民族大多是有神論者一樣。有神論（來自希臘語「*theos*」，意為「神」）是認為普遍秩序是基於人與一小群不可見的實體——神——之間的等級關係的信仰。當然，可以說古代的農耕民族傾向於有神論，但這並沒有多少教益。泛稱「有神論者」包括十八世紀波蘭的猶太拉比、十七世紀馬薩諸塞州的焚巫教徒、十五世紀墨西哥的阿茲特克祭司、十二世紀伊朗的蘇菲教神秘主義者、十世紀的維京戰士、二世紀的羅馬軍隊軍士和一世紀的中國官僚。其中每個人都認為其他人的信仰和實踐是怪異和異端的。萬物有靈論者的信仰和實踐之間的差異可能同樣巨大。他們的宗教體驗可能動盪不安，充滿爭議、改革和革命。

But these cautious generalisations are about as far as we can go. Any attempt to describe the specifics of archaic spirituality is highly speculative, as there is next to no evidence to go by and the little evidence we have – a handful of artefacts and cave paintings – can be interpreted in myriad ways. The theories of scholars who claim to know what the foragers felt shed much more light on the prejudices of their authors than on Stone Age religions.

Instead of erecting mountains of theory over a molehill of tomb relics, cave paintings and bone statuettes, it is better to be frank and admit that we have only the haziest notions about the religions of ancient foragers. We assume that they were animists, but that's not very informative. We don't know which spirits they prayed to, which festivals they celebrated, or which taboos they observed. Most importantly, we don't know what stories they told. It's one of the biggest holes in our understanding of human history.

但這些謹慎的概括幾乎就是我們所能掌握的最多內容了。任何嘗試描述古代靈性具體細節的行為都是高度推測性的，因為我們幾乎沒有什麼證據可以作為參考，而我們所擁有的少量證據——一些文化遺物和洞穴壁畫——可以被解釋為許多不同方式。聲稱知道狩獵採集者所感受的學者的理論，更多地揭示出其作者的偏見，而非關於史前宗教的信息。與其在一堆墳墓文物、洞穴壁畫和骨雕像上沉積眾多理論，倒不如坦率地承認我們對古代狩獵採集者的宗教信仰只有模糊概念。我們假定他們是萬物有靈論者，但這不是很有信息量的描述。我們不知道他們祈禱哪些靈魂、慶祝哪些節日或是遵守哪些禁忌。最重要的是，我們不知道他們講述哪些故事。這可能是我們對人類歷史的理解中最大的短板之一。

The sociopolitical world of the foragers is another area about which we know next to nothing. As explained above, scholars cannot even agree on the basics, such as the existence of private property, nuclear families and monogamous relationships. It's likely that different bands had different structures. Some may have been as hierarchical, tense and violent as the nastiest chimpanzee group, while others were as laid-back, peaceful and lascivious as a bunch of bonobos.



8. A painting from Lascaux Cave , c .15,000–20,000 years ago. What exactly do we see, and what is the painting's meaning? Some argue that we see a man with the head of a bird and an erect penis, being killed by a bison. Beneath the man is another bird which might symbolise the soul, released from the body at the moment of death. If so, the picture depicts not a prosaic hunting accident, but rather the passage from this world to the next. But we have no way of knowing whether any of these speculations are true. It's a Rorschach test that reveals much about the preconceptions of modern scholars, and little about the beliefs of ancient foragers .

狩獵採集者的社會政治世界是另一個我們幾乎一無所知的領域。正如上面所講的，學者們甚至無法就基本問題達成共識，像私人財產、核心家庭和一夫一妻制的存在。不同的族群可能有不同的結構。有些可能像最惡劣的黑猩猩族群一樣等級制度嚴格、緊張和暴力，而另一些可能像一群倭黑猩猩一樣悠閒、和平和好色。 8. Lascaux洞窟的一幅畫，約15,000-20,000年前。我們到底看到了什麼？這幅畫的含義是什

麼？有人認為我們看到一個長有鳥頭和勃起陽具的男人被野牛殺死。在男人下方是另一隻鳥，可能象徵著靈魂，在死亡時自身得以解脫。如果是這樣的話，這幅圖畫描繪的不是平淡無奇的狩獵事故，而是從這個世界到下一個世界的過渡。但我們無法知道這些猜測中的任何一個是否屬實。它是一個類似羅夏克測試的東西，顯示了現代學者的偏見，但對古代狩獵採集者的信仰幾乎沒有幫助。

In Sungir, Russia, archaeologists discovered in 1955 a 30,000-year-old burial site belonging to a mammoth-hunting culture. In one grave they found the skeleton of a fifty-year-old man, covered with strings of mammoth ivory beads, containing about 3,000 beads in total. On the dead man's head was a hat decorated with fox teeth, and on his wrists twenty-five ivory bracelets. Other graves from the same site contained far fewer goods. Scholars deduced that the Sungir mammoth-hunters lived in a hierarchical society, and that the dead man was perhaps the leader of a band or of an entire tribe comprising several bands. It is unlikely that a few dozen members of a single band could have produced so many grave goods by themselves.



9. Hunter-gatherers made these handprints about 9,000 years ago in the 'Hands Cave', in Argentina. It looks as if these long-dead hands are reaching towards us from within the rock. This is one of the most moving relics of the ancient forager world – but nobody knows what it means .

在俄羅斯的松吉爾（Sungir），考古學家於1955年發現一個屬於獵獸文化的30,000年前的墓地。其中一個墓穴中，他們發現一個50歲男子的骸骨，上面掛滿了長長的長毛象牙珠串，共約3000顆珠子。死者的頭上戴著裝飾著狐狸牙齒的帽子，手腕上帶著25個象牙手鐲。同一個墓地的其他墓穴中包含的物品要少得多。學者推斷，松吉爾的獵獸者生活在一個等級制度的社會中，這位死者也許是一個團隊或是由幾個團隊組成的部落的領袖。一個僅有幾十位成員的團隊很難獨自製造出如此多的墓葬用品。9. 獵獵採集者於約9000年前在阿根廷的“手印洞穴”留下了這些手印。看起來，這些早已過世的手正在從岩石中向我們伸出。這是古代採集者世界中最動人的遺跡之一，但沒有人知道它的含義。

Archaeologists then discovered an even more interesting tomb. It contained two skeletons, buried head to head. One belonged to a boy aged about twelve or thirteen, and the other to a girl of about nine or ten. The boy was covered with 5,000 ivory beads. He wore a fox-tooth hat and a belt with 250 fox teeth (at least sixty foxes had to have their teeth pulled to get that many). The girl was adorned with 5,250 ivory beads. Both children were surrounded by statuettes and various ivory objects. A skilled craftsman (or craftswoman) probably needed about forty-five minutes to prepare a single ivory bead. In other words, fashioning the 10,000 ivory beads that covered the two children, not to mention the other objects, required some 7,500 hours of delicate work, well over three years of labour by an experienced artisan!

考古學家後來發現一座更有趣的墓室。它包含兩個骸骨，頭對頭埋葬。一個屬於約十二或十三歲的男孩，另一個屬於約九或十歲的女孩。男孩身上覆蓋著5,000顆象牙珠，戴著狐牙帽和一條有250顆狐牙的皮帶（至少要抽取60隻狐狸的牙齒才能得到這麼多）。女孩裝飾著5,250顆象牙珠。這兩名孩子周圍有各種塑像和象牙工藝品。一位熟練的工匠（或女工）大約需要四十五分鐘的時間來準備單個的象牙珠。換句話說，在這兩名孩子身上覆蓋著的10,000顆象牙珠，更不用說其

他物品，需要進行7500小時的精細工作，這相當於一位經驗豐富的工匠三年以上的勞動時間！

It is highly unlikely that at such a young age the Sungir children had proved themselves as leaders or mammoth-hunters. Only cultural beliefs can explain why they received such an extravagant burial. One theory is that they owed their rank to their parents. Perhaps they were the children of the leader, in a culture that believed in either family charisma or strict rules of succession. According to a second theory, the children had been identified at birth as the incarnations of some long-dead spirits. A third theory argues that the children's burial reflects the way they died rather than their status in life. They were ritually sacrificed – perhaps as part of the burial rites of the leader – and then entombed with pomp and circumstance.⁹

Whatever the correct answer, the Sungir children are among the best pieces of evidence that 30,000 years ago Sapiens could invent sociopolitical codes that went far beyond the dictates of our DNA and the behaviour patterns of other human and animal species.

在這麼年輕的年紀，宋吉爾的孩子們很難證明自己是領袖或獵猛獸者。僅有文化信仰可以解釋為什麼他們能得到如此奢華的葬禮。一個理論是，他們的地位可能歸功於他們的父母。也許他們是領袖的孩子，在一個相信家族魅力或嚴格繼承規則的文化中。根據第二個理論，這些孩子在出生時被確定為某些已逝的靈魂的化身。第三個理論認為，孩子們的埋葬反映了他們死亡的方式，而不是他們在生活中的地位。他們被祭獻了——也許是作為領袖的葬禮儀式的一部分——然後被隆重地安葬。無論正確答案是什麼，宋吉爾的孩子們是證明了30,000年前智人可以創造出超越我們的DNA和其他人類和動物物種的行為模式的社會政治規範的最佳證據。

Peace or War?

Finally, there's the thorny question of the role of war in forager societies. Some scholars imagine ancient hunter-gatherer societies as peaceful paradises, and argue that war and violence began only with the Agricultural Revolution, when people started to accumulate private property. Other

scholars maintain that the world of the ancient foragers was exceptionally cruel and violent. Both schools of thought are castles in the air, connected to the ground by the thin strings of meagre archaeological remains and anthropological observations of present-day foragers.

The anthropological evidence is intriguing but very problematic. Foragers today live mainly in isolated and inhospitable areas such as the Arctic or the Kalahari, where population density is very low and opportunities to fight other people are limited. Moreover, in recent generations, foragers have been increasingly subject to the authority of modern states, which prevent the eruption of large-scale conflicts. European scholars have had only two opportunities to observe large and relatively dense populations of independent foragers: in north-western North America in the nineteenth century, and in northern Australia during the nineteenth and early twentieth centuries. Both Amerindian and Aboriginal Australian cultures witnessed frequent armed conflicts. It is debatable, however, whether this represents a ‘timeless’ condition or the impact of European imperialism.

最後，有一個棘手問題是戰爭在採集社會中的角色。一些學者把古老的獵人採集社會想像成和平的天堂，並認為戰爭和暴力是從農業革命開始，當人們開始積累私人財產時才開始出現。其他學者則主張古代採集者的世界極其殘酷和暴力。這兩種觀點都是空中樓閣，只能通過瑣碎的考古遺跡和對當代採集者的人類學觀察來聯繫地面。人類學證據非常有趣，但也極為棘手。現今的採集者主要居住在像北極或卡拉哈裡這樣孤立和荒涼的地區，人口密度非常低，與其他人爭鬥的機會也很有限。此外，在最近幾代人中，採集者越來越受到現代國家的權威制約，這也就防止了大規模衝突的爆發。歐洲的學者只有兩次機會觀察到獨立採集者的大規模和相對密集的人口：十九世紀的北美西北部和十九世紀和二十世紀初的澳大利亞北部。無論是美洲原住民還是澳洲土著文化都經常發生武裝衝突。然而，這是否代表一種“永恆”的狀態還是歐洲帝國主義的影響，還有待商榷。

The archaeological findings are both scarce and opaque. What telltale clues might remain of any war that took place tens of thousands of years ago? There were no fortifications and walls back then, no artillery shells or even swords and shields. An ancient spear point might have been used in war, but it could have been used in a hunt as well. Fossilised human bones are no less

hard to interpret. A fracture might indicate a war wound or an accident. Nor is the absence of fractures and cuts on an ancient skeleton conclusive proof that the person to whom the skeleton belonged did not die a violent death. Death can be caused by trauma to soft tissues that leaves no marks on bone. Even more importantly, during pre-industrial warfare more than 90 per cent of war dead were killed by starvation, cold and disease rather than by weapons. Imagine that 30,000 years ago one tribe defeated its neighbour and expelled it from coveted foraging grounds. In the decisive battle, ten members of the defeated tribe were killed. In the following year, another hundred members of the losing tribe died from starvation, cold and disease. Archaeologists who come across these no skeletons may too easily conclude that most fell victim to some natural disaster. How would we be able to tell that they were all victims of a merciless war?

考古發現的證據非常稀少且不透明。成千上萬年前的戰爭留下了怎樣的告訴性線索？當時沒有城牆和要塞，沒有炮彈，甚至沒有劍和盾牌。古老的矛頭可能用於戰爭，但也可能用於打獵。化石化的人骨也同樣難以解釋。斷裂可能表明是戰傷或意外。經過年代久遠的骨骼上缺少斷裂和割傷也不見得證明該人死於暴力事件。死亡可能是由於對軟組織的創傷造成的，而骨骼上卻留下了痕跡。更重要的是，在前工業時代的戰爭中，超過90%的戰死者死於饑餓、寒冷和疾病，而不是被武器殺死。假設在30,000年前，一個部落擊敗了它的鄰居並將其驅逐出所渴望的覓食區。在關鍵的戰鬥中，十名被擊敗的部落成員被殺。在接下來的一年中，另外一百名落敗的部落成員死於饑餓、寒冷和疾病。發現這些無骨骼的考古學家們可能會太容易地得出結論，即大多數人都是某種自然災害的受害者。我們又怎樣能夠判斷他們都是無情戰爭的受害者呢？

Duly warned, we can now turn to the archaeological findings. In Portugal, a survey was made of 400 skeletons from the period immediately predating the Agricultural Revolution. Only two skeletons showed clear marks of violence. A similar survey of 400 skeletons from the same period in Israel discovered a single crack in a single skull that could be attributed to human violence. A third survey of 400 skeletons from various pre-agricultural sites in the Danube Valley found evidence of violence on eighteen skeletons. Eighteen out of 400 may not sound like a lot, but it's actually a very high percentage. If all eighteen indeed died violently, it means that about 4.5 per

cent of deaths in the ancient Danube Valley were caused by human violence. Today, the global average is only 1.5 per cent, taking war and crime together. During the twentieth century, only 5 per cent of human deaths resulted from human violence – and this in a century that saw the bloodiest wars and most massive genocides in history. If this revelation is typical, the ancient Danube Valley was as violent as the twentieth century.*

經過預警後，我們可以轉向考古發現。在葡萄牙，對立即在農業革命之前的時期普查了400具骸骨，只有兩具骨骼顯示明顯的暴力痕跡。在同一時期，以色列對400具骸骨進行了類似調查，發現只有一個人的頭骨出現了可以歸因於人類暴力的裂縫。在多個先農業時期的多個丹努布河流域的考古地點進行第三次普查時，發現了18具骨骼上的暴力證據。18具骨骼中的每一個都死於暴力，雖然比例不高，只有400中的4.5%，但事實上非常高。如果以這18具骨骼的死亡方式來看待，這表示古代丹努布河谷約有4.5%的死因是由於人類暴力造成的。今天，全球平均死亡率只有1.5%，包括戰爭和犯罪在內。在20世紀，只有5%的死亡是由於人類暴力造成的，而這是歷史上最血腥的戰爭和種族滅絕的世紀。如果這個發現是典型的，那麼古代的丹努布河谷和20世紀一樣暴力。

The depressing findings from the Danube Valley are supported by a string of equally depressing findings from other areas. At Jabl Sahaba in Sudan, a 12,000-year-old cemetery containing fifty-nine skeletons was discovered. Arrowheads and spear points were found embedded in or lying near the bones of twenty-four skeletons, 40 per cent of the find. The skeleton of one woman revealed twelve injuries. In Ofnet Cave in Bavaria, archaeologists discovered the remains of thirty-eight foragers, mainly women and children, who had been thrown into two burial pits. Half the skeletons, including those of children and babies, bore clear signs of damage by human weapons such as clubs and knives. The few skeletons belonging to mature males bore the worst marks of violence. In all probability, an entire forager band was massacred at Ofnet.

多瑙河谷令人沮喪的發現得到了其他地區同樣令人沮喪的發現的支持。在蘇丹的賈布爾·薩哈巴，發現了一個有五十九具骸骨的12000年古墓。發現了箭頭和矛尖，它們嵌入了或躺在二十四具骸骨的附近，佔發現數量的40%。其中一位女性的骨骼顯示出十二處傷口。在德國

巴伐利亞州的奧夫內特洞穴中，考古學家發現了三十八個狩獵者的遺骸，主要是婦女和孩子，被扔進了兩個墓穴中。一半的骸骨，包括嬰兒和孩子的骸骨，都明顯帶有人類武器，如棍棒和刀械造成的損傷。幾具成年男性的骸骨帶有最嚴重的暴力痕跡。很可能在奧夫內特發生了一次全族狩獵者的大屠殺。

Which better represents the world of the ancient foragers: the peaceful skeletons from Israel and Portugal, or the abattoirs of Jabl Sahaba and Ofnet? The answer is neither. Just as foragers exhibited a wide array of religions and social structures, so, too, did they probably demonstrate a variety of violence rates. While some areas and some periods of time may have enjoyed peace and tranquillity, others were riven by ferocious conflicts. [10](#)

The Curtain of Silence

If the larger picture of ancient forager life is hard to reconstruct, particular events are largely irretrievable. When a Sapiens band first entered a valley inhabited by Neanderthals, the following years might have witnessed a breathtaking historical drama. Unfortunately, nothing would have survived from such an encounter except, at best, a few fossilised bones and a handful of stone tools that remain mute under the most intense scholarly inquisitions. We may extract from them information about human anatomy, human technology, human diet, and perhaps even human social structure. But they reveal nothing about the political alliance forged between neighbouring Sapiens bands, about the spirits of the dead that blessed this alliance, or about the ivory beads secretly given to the local witch doctor in order to secure the blessing of the spirits.

哪一個更能代表古代狩獵者的世界：來自以色列和葡萄牙的和平骸骨，還是來自 Jabl Sahaba 和 Ofnet 的屠宰場？答案是都不是。就像狩獵者展示了各種各樣的宗教和社會結構一樣，他們可能也展示了不同的暴力率。雖然有些地區和某些時期可能享有和平與安寧，但其他地方卻被激烈的衝突所撕裂。如果復原古代狩獵者生活的大局面很難，具體事件就更無從得知了。當智人族群第一次進入被尼安德特人居住的山谷時，接下來的幾年可能會見證到驚人的歷史戲劇。不幸的是，這樣的遭遇除了一些化石化的骨骸和一些石器之外，什麼也沒有留

下，即使在最激烈的學術證明下，它們始終保持沉默。我們可以從中提取人類解剖學、人類技術、人類飲食甚至人類社會結構的信息。但它們並不顯示相鄰智人族群之間建立的政治聯盟、祝福這一聯盟的死者靈魂，或是用來獲得靈魂祝福的象牙珠子，這些都被秘密地交給當地的巫醫。

This curtain of silence shrouds tens of thousands of years of history. These long millennia may well have witnessed wars and revolutions, ecstatic religious movements, profound philosophical theories, incomparable artistic masterpieces. The foragers may have had their all-conquering Napoleons, who ruled empires half the size of Luxembourg; gifted Beethovens who lacked symphony orchestras but brought people to tears with the sound of their bamboo flutes; and charismatic prophets who revealed the words of a local oak tree rather than those of a universal creator god. But these are all mere guesses. The curtain of silence is so thick that we cannot even be sure such things occurred – let alone describe them in detail.

Scholars tend to ask only those questions that they can reasonably expect to answer. Without the discovery of as yet unavailable research tools, we will probably never know what the ancient foragers believed or what political dramas they experienced. Yet it is vital to ask questions for which no answers are available, otherwise we might be tempted to dismiss 60,000 of 70,000 years of human history with the excuse that ‘the people who lived back then did nothing of importance’.

這層沈默的帷幕，籠罩了數以萬計年的歷史。這些悠久的千年可能見證了戰爭和革命，狂熱的宗教運動，深刻的哲學理論，無與倫比的藝術傑作。採集者可能有他們的征服拿破崙，統治半個盧森堡帝國的人；有才華橫溢的貝多芬，雖然缺乏交響樂團，但用竹笛的聲音讓人們痛哭流涕；還有有領袖氣質的預言家，他們所揭示的是當地橡樹的聲音，而不是普遍造物主的話語。但這些只是猜測。這層沈默的帷幕是如此之厚，以至於我們甚至無法確定是否發生了這樣的事情-更不用說詳細地描述它們了。學者們往往只會問那些他們可以合理預期回答的問題。如果沒有尚未可用的研究工具的發現，我們很可能永遠不知道古代採集者相信什麼或經歷了什麼政治劇情。然而，問那些沒有答案的問題是至關重要的，否則我們可能會因為“那些曾經生活的人沒有做重要的事情”而傾向於否定人類歷史的 60,000 年至 70,000 年。

The truth is that they did a lot of important things. In particular, they shaped the world around us to a much larger degree than most people realise. Trekkers visiting the Siberian tundra, the deserts of central Australia and the Amazonian rainforest believe that they have entered pristine landscapes, virtually untouched by human hands. But that's an illusion. The foragers were there before us and they brought about dramatic changes even in the densest jungles and the most desolate wildernesses. The next chapter explains how the foragers completely reshaped the ecology of our planet long before the first agricultural village was built. The wandering bands of storytelling Sapiens were the most important and most destructive force the animal kingdom had ever produced.

事實是，他們做了很多重要的事情。特別是，他們塑造了我們周圍的世界，比大多數人意識到的還要大得多。前往西伯利亞的苔原、澳大利亞中部的沙漠和亞馬遜雨林的漫遊者相信，他們已進入了幾乎沒有被人類手印觸及的原始景觀。但這是一個幻象。在我們之前，狩獵採集者就已經在那裡，並且即使在最茂密的叢林和最荒蕪的野地中，他們也帶來了戲劇性的變化。下一章解釋了在第一個農業聚落建成之前，狩獵採集者如何完全重塑了我們星球的生態系。講故事的智人遊牧族群是動物王國迄今為止最重要、最具破壞性的力量。

* A 'horizon of possibilities' means the entire spectrum of beliefs, practices and experiences that are open before a particular society, given its ecological, technological and cultural limitations. Each society and each individual usually explore only a tiny fraction of their horizon of possibilities.

* It might be argued that not all eighteen ancient Danubians actually died from the violence whose marks can be seen on their remains. Some were only injured. However, this is probably counterbalanced by deaths from trauma to soft tissues and from the invisible deprivations that accompany war.

* 「可能性的地平線」指的是在特定社會給定其生態、科技及文化限制下，開放的所有信仰、實踐和經驗的完整光譜。每個社會和每個個人通常只會探索他們可能性地平線的一小部分。* 可能會有論點認為並不是所有十八位原始丹珀人都死於可以在他們的遺骸上看到的暴

力。有些只是受傷了。然而，這可能被來自軟組織的創傷死亡和隨著戰爭而伴隨的不可見的剝奪所抵消。

4

The Flood

PRIOR TO THE COGNITIVE REVOLUTION, humans of all species lived exclusively on the Afro-Asian landmass. True, they had settled a few islands by swimming short stretches of water or crossing them on improvised rafts. Flores, for example, was colonised as far back as 850,000 years ago. Yet they were unable to venture into the open sea, and none reached America, Australia, or remote islands such as Madagascar, New Zealand and Hawaii.

The sea barrier prevented not just humans but also many other Afro-Asian animals and plants from reaching this ‘Outer World’. As a result, the organisms of distant lands like Australia and Madagascar evolved in isolation for millions upon millions of years, taking on shapes and natures very different from those of their distant Afro-Asian relatives. Planet Earth was separated into several distinct ecosystems, each made up of a unique assembly of animals and plants. *Homo sapiens* was about to put an end to this biological exuberance.

在認知革命之前，人類所有物種都僅生活在非洲和亞洲的陸地上。的確，他們通過游泳短距離的水域或乘坐臨時建造的筏子來在一些島嶼定居。例如，佛洛里斯島早在850,000年前就被殖民了。然而，他們無法冒險進入開放的海洋，也沒有到達美洲、澳大利亞或遙遠的島嶼，例如馬達加斯加、新西蘭和夏威夷。海洋障礙不僅阻止了人類，還防止了許多其他非洲和亞洲的動植物進入這個“外部世界”。結果，像澳大利亞和馬達加斯加這樣的遠端土地上的生物在相隔數百萬年的孤立環境中進化，形成了與他們的遠親非洲和亞洲動植物非常不同的形狀和特性。地球被分為幾個不同的生態系統，每個生態系由獨特的動植物組合組成。智人即將終結這種生物繁榮。

Following the Cognitive Revolution, Sapiens acquired the technology, the organisational skills, and perhaps even the vision necessary to break out of

Afro-Asia and settle the Outer World. Their first achievement was the colonisation of Australia some 45,000 years ago. Experts are hard-pressed to explain this feat. In order to reach Australia, humans had to cross a number of sea channels, some more than a hundred kilometres wide, and upon arrival they had to adapt nearly overnight to a completely new ecosystem.

The most reasonable theory suggests that, about 45,000 years ago, the Sapiens living in the Indonesian archipelago (a group of islands separated from Asia and from each other by only narrow straits) developed the first seafaring societies. They learned how to build and manoeuvre ocean-going vessels and became long-distance fishermen, traders and explorers. This would have brought about an unprecedented transformation in human 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.

在认知革命之后，智人获得了技术、组织技能，甚至可能是突破非洲并定居外部世界所需的愿景。他们的第一个成就是在大约45,000年前殖民澳大利亚。专家难以解释这个壮举。为了到达澳大利亚，人类必须穿过许多海峡，有些宽度超过100公里，并且到达后他们必须几乎过夜地适应全新的生态系统。最合理的理论表明，在大约45,000年前，生活在印度尼西亚群岛的智人（一组只隔窄海峡与亚洲和彼此分离的岛屿）发展了第一批航海社会。他们学会了如何建造和驾驶海洋船只，成为远洋渔民、贸易商和探险家。这将引发人类能力和生活方式的前所未有的转变。其他海洋哺乳动物 - 海豹，海牛，海豚 - 需要演化几亿年才能发展出专业器官和流体力学的身体。生活在印尼的智人是非洲大草原上生活的猿的后代，成为太平洋航海者，而没有长出鳍，也不必等待他们的鼻子像鲸一样迁移到头部的顶部。相反，他们建造了船只并学会了如何驾驶它们。这些技能使他们能够到达并定居澳大利亚。

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

考古學家確實尚未挖掘出可追溯至4.5萬年前、能夠證明當時已有木筏、槳或漁村的文物（因為隨著海平面上升，印尼古老海岸已被埋在數百米深的海底下）。然而，有強有力的大量證據支持這個理論，尤其是在澳洲殖民後的數千年中，智人開始殖民北方許多小島，這些島嶼之間是孤立的。一些小島，如布卡和馬努斯，距離最近的陸地相隔200公里。很難相信任何人沒有先進的船隻和航海技能就可以到達和殖民馬努斯。正如前文所述，也有確實的證據顯示這些島嶼之間有著定期的海上貿易，例如新愛爾蘭島和新不列顛島。

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. The settlers of Australia, or more accurately, its conquerors, didn't just adapt, they transformed the Australian ecosystem beyond recognition.

第一批人類抵達澳洲的旅程是歷史上最重要的事件之一，至少與哥倫布抵達美洲或阿波羅11號登月探險一樣重要。這是人類第一次成功離開非洲 - 亞洲生態系統，確實也是第一次有大型陸地哺乳動物從非洲或亞洲過境到澳洲。更重要的是，人類先驅者在這個新世界所做的事情。第一個獵人-採集者踏上澳洲海灘的那一刻，便是智人攀登特定陸地食物鏈頂端的時刻，自此成為地球史上最致命的物種。此前，人類展現了一些革新的適應和行為，但對環境的影響微不足道。他們成功地在不同的棲息地移動和適應，但沒有徹底改變這些棲息地。澳洲的定居者或更精確地說是征服者們不僅適應，還將澳洲生態系統徹底改變到無法辨識。

The first human footprint on a sandy Australian beach was immediately washed away by the waves. Yet when the invaders advanced inland, they left behind a different footprint, one that would never be expunged. As they pushed on, they encountered a strange universe of unknown creatures that included a 200-kilogram, two-metre kangaroo, and a marsupial lion, as massive as a modern tiger, that was the continent's largest predator. Koalas far too big to be cuddly and cute rustled in the trees and flightless birds twice the size of ostriches sprinted on the plains. Dragon-like lizards and snakes five metres long slithered through the undergrowth. The giant diprotodon, a two-and-a-half-ton wombat, roamed the forests. Except for the birds and reptiles, all these animals were marsupials – like kangaroos, they gave birth to tiny, helpless, fetus-like young which they then nurtured with milk in abdominal pouches. Marsupial mammals were almost unknown in Africa and Asia, but in Australia they reigned supreme.

在澳洲沙灘上第一個人類腳印被海浪立刻沖走。然而，當入侵者向內陸推進時，他們留下了另一種永遠不會消失的腳印。當他們向前推進時，他們會遇到一個奇怪的未知生物宇宙，其中包括一隻重達200公斤，有兩米高的袋鼠和一頭袋獅，與現代老虎一樣巨大，是該大陸上最大的掠食者。樹上爬著太大而不可愛的無尾熊，草原上有兩倍於鶲鳥大小的無法飛行的鳥類。像龍一樣的蜥蜴和長達五米的蛇在灌木叢中爬行。巨型雙門齒獸，一只重達兩噸半的袋熊，在森林中游蕩。除了鳥類和爬行動物，所有這些動物都是有袋類動物-像袋鼠一樣，他們生下微小，無助，胎兒狀的幼仔，然後在腹部袋子裡哺育。有袋哺乳動物在非洲和亞洲幾乎不為人知，但在澳大利亞他們統治著。

Within a few thousand years, virtually all of these giants vanished. Of the twenty-four Australian animal species weighing fifty kilograms or more, twenty-three became extinct.² A large number of smaller species also disappeared. Food chains throughout the entire Australian ecosystem were broken and rearranged. It was the most important transformation of the Australian ecosystem for millions of years. Was it all the fault of *Homo sapiens*?

Guilty as Charged

Some scholars try to exonerate our species, placing the blame on the vagaries of the climate (the usual scapegoat in such cases). Yet it is hard to believe that *Homo sapiens* was completely innocent. There are three pieces of evidence that weaken the climate alibi, and implicate our ancestors in the extinction of the Australian megafauna.

數千年內，幾乎所有這些巨人都消失了。24種澳大利亞重達50公斤或以上的動物中，有23種已經滅絕。大量的小型物種也消失了。整個澳大利亞生態系統的食物鏈被打破並重新排列。這是澳大利亞生態系統數以百萬計年來最重要的轉變。這全都是智人的錯嗎？一些學者試圖為我們的物種開脫罪責，將責任歸咎於氣候的脾氣（在這種情況下通常是替罪羊）。然而，很難相信智人完全無辜。有三個證據削弱了氣候辯護，並使我們的祖先參與了澳大利亞巨型動物的滅絕。

Firstly, even though Australia's climate changed some 45,000 years ago, it wasn't a very remarkable upheaval. It's hard to see how the new weather patterns alone could have caused such a massive extinction. It's common today to explain anything and everything as the result of climate change, but the truth is that earth's climate never rests. It is in constant flux. Every event in history occurred against the background of some climate change.

In particular, our planet has experienced numerous cycles of cooling and warming. During the last million years, there has been an ice age on average every 100,000 years. The last one ran from about 75,000 to 15,000 years ago. Not unusually severe for an ice age, it had twin peaks, the first about 70,000 years ago and the second at about 20,000 years ago. The giant diprotodon appeared in Australia more than 1.5 million years ago and

successfully weathered at least ten previous ice ages. It also survived the first peak of the last ice age, around 70,000 years ago. Why, then, did it disappear 45,000 years ago? Of course, if diprotodons had been the only large animal to disappear at this time, it might have been just a fluke. But more than 90 per cent of Australia's megafauna disappeared along with the diprotodon. The evidence is circumstantial, but it's hard to imagine that Sapiens, just by coincidence, arrived in Australia at the precise point that all these animals were dropping dead of the chills.³

首先，雖然澳大利亞的氣候在約四萬五千年前發生了一些變化，但這並不是一個非常顯著的劇變。很難看出新的氣候模式單獨會引起如此大規模的滅絕。今天，把所有事情都解釋為氣候變化的結果是很常見的，但事實是地球的氣候從來沒有休息過。它在不斷的變化中。歷史上的每一個事件都發生在一些氣候變化的背景下。特別是，我們的星球已經經歷過無數次的冷卻和加熱循環。在過去的一百萬年中，平均每十萬年會有一個冰河時期。最後一個冰河時期發生在大約七萬五千年前到一萬五千年前。它並不是一個非常嚴重的冰河時期，它有兩個高峰，第一個大約在七萬年前，第二個大約在二萬年前。巨型雙門齒獸出現在澳大利亞超過一百五十萬年前，並成功地經歷了至少十個以前的冰河時期。它還在最後一個冰河時期的第一個高峰，即大約七萬年前存活下來。那麼，為什麼它在四萬五千年前消失了呢？當然，如果雙門齒獸是那個時候唯一消失的大型動物，那可能只是一個巧合。但是，超過90%的澳大利亞大型哺乳動物都隨著雙門齒獸一起消失了。證據是間接的，但很難想象，恰好在所有這些動物死于寒意的時候，人類恰好抵達澳大利亞。

Secondly, when climate change causes mass extinctions, sea creatures are usually hit as hard as land dwellers. Yet there is no evidence of any significant disappearance of oceanic fauna 45,000 years ago. Human involvement can easily explain why the wave of extinction obliterated the terrestrial megafauna of Australia while sparing that of the nearby oceans. Despite its burgeoning navigational abilities, *Homo sapiens* was still overwhelmingly a terrestrial menace.

Thirdly, mass extinctions akin to the archetypal Australian decimation occurred again and again in the ensuing millennia – whenever people settled another part of the Outer World. In these cases Sapiens guilt is irrefutable.

For example, the megafauna of New Zealand – which had weathered the alleged ‘climate change’ of c. 45,000 years ago without a scratch – suffered devastating blows immediately after the first humans set foot on the islands. The Maoris, New Zealand’s first Sapiens colonisers, reached the islands about 800 years ago. Within a couple of centuries, the majority of the local megafauna was extinct, along with 60 per cent of all bird species.

其次，當氣候變化造成大規模滅絕時，海洋生物通常與陸地生物一樣受到嚴重打擊。然而，在約45,000年前，並沒有任何重要的海洋生物消失的證據。人類的介入可以很容易地解釋為什麼滅絕的浪潮消滅了澳大利亞的陸地巨型動物，卻保留了附近海洋的動物。儘管人類智慧的航行能力不斷增強，但是人類仍然是壓倒性的陸地威脅。第三，尋常的澳大利亞災難再次發生在接下來的幾千年中，每當人們開始在外部世界的其他地方定居時。在這些情況下，Sapiens的罪行是不可爭辯的。例如，紐西蘭的巨型動物-在約45,000年前的所謂“氣候變化”中毫髮無損-在第一批人登陸島嶼之後立即遭受了毀滅性的打擊。紐西蘭的第一批Sapiens定居者瑪奧人在大約800年前抵達該島，幾個世紀後，大部分當地的巨型動物和60%的鳥類物種都已經滅絕。

A similar fate befell the mammoth population of Wrangel Island in the Arctic Ocean (200 kilometres north of the Siberian coast). Mammoths had flourished for millions of years over most of the northern hemisphere, but as *Homo sapiens* spread – first over Eurasia and then over North America – the mammoths retreated. By 10,000 years ago there was not a single mammoth to be found in the world, except on a few remote Arctic islands, most conspicuously Wrangel. The mammoths of Wrangel continued to prosper for a few more millennia, then suddenly disappeared about 4,000 years ago, just when the first humans reached the island.

Were the Australian extinction an isolated event, we could grant humans the benefit of the doubt. But the historical record makes *Homo sapiens* look like an ecological serial killer.

北極洋的瓦朗格爾島（位於西伯利亞沿岸以北200公里）的猛獁群體也遭遇了類似的命運。猛獁在北半球的大部分地區繁衍生息數百萬年，但隨著智人的擴散 - 首先是在歐亞大陸上，然後是在北美洲上 - 猛獁撤退了。到了一萬年前，世界上再也找不到一隻猛獁，除了在一些偏

遠的北極島嶼上，其中最為顯著的就是瓦朗格爾島。瓦朗格爾的猛獁在接下來的幾千年中繁榮發展，然後在約4000年前突然消失，就在第一批人類抵達這個島嶼的時候。如果澳大利亞滅絕事件是個孤立事件，我們可以給予智人疑點的幫助。但歷史記錄使智人看起來像是生態的連續殺手。

All the settlers of Australia had at their disposal was Stone Age technology. How could they cause an ecological disaster? There are three explanations that mesh quite nicely.

Large animals – the primary victims of the Australian extinction – breed slowly. Pregnancy is long, offspring per pregnancy are few, and there are long breaks between pregnancies. Consequently, if humans cut down even one diprotodon every few months, it would be enough to cause diprotodon deaths to outnumber births. Within a few thousand years the last, lonesome diprotodon would pass away, and with her the entire species.⁴

In fact, for all their size, diprotodons and Australia's other giants probably wouldn't have been that hard to hunt because they would have been taken totally by surprise by their two-legged assailants. Various human species had been prowling and evolving in Afro-Asia for 2 million years. They slowly honed their hunting skills, and began going after large animals around 400,000 years ago. The big beasts of Africa and Asia learned to avoid humans, so when the new mega-predator – *Homo sapiens* – appeared on the Afro-Asian scene, the large animals already knew to keep their distance from creatures that looked like it. In contrast, the Australian giants had no time to learn to run away. Humans don't come across as particularly dangerous. They don't have long, sharp teeth or muscular, lithe bodies. So when a diprotodon, the largest marsupial ever to walk the earth, set eyes for the first time on this frail-looking ape, he gave it one glance and then went back to chewing leaves. These animals had to evolve a fear of humankind, but before they could do so they were gone.

所有澳大利亚移民都只有石器时代的技术。他们怎么会导致生态灾难呢？这里有三个解释，相当契合。澳洲灭绝的主要受害者——大型动物繁殖缓慢。怀孕时间长，每次怀孕的后代数量很少，而且怀孕之间还有长时间的间隔。因此，如果人类每几个月砍伐一只肋骨动物，就

足以导致肋骨动物的死亡数量超过出生数量。几千年后，最后一只孤独的肋骨动物会死去，整个物种也会消失。事实上，尽管身形庞大，肋骨动物以及澳大利亚的其他巨兽可能并不难被猎杀，因为它们会被它们两条腿的攻击者完全出乎意料地攻击。各种人类物种已经在非洲-亚洲地区徘徊和进化了200万年。他们慢慢地磨练了狩猎技巧，并在大约40万年前开始猎杀大型动物。非洲和亚洲的大型动物已经学会了避开人类，因此，当新的超级捕食者——智人——出现在非洲-亚洲舞台上时，这些大型动物已经知道要保持与看起来像它们的生物保持距离了。相比之下，澳大利亚的巨兽没有时间学会逃跑。人类不会显得特别危险。它们没有长而锋利的牙齿或肌肉发达的身体。因此，当一个肋骨动物——有史以来最大的有袋动物——第一次看到这个脆弱的猿猴时，它只匆匆一瞥，然后又回到了咀嚼叶子的状态。这些动物必须进化出对人类的恐惧，但在它们能够这样做之前，它们就消失了。

The second explanation is that by the time Sapiens reached Australia, they had already mastered fire agriculture. Faced with an alien and threatening environment, they deliberately burned vast areas of impassable thickets and dense forests to create open grasslands, which attracted more easily hunted game, and were better suited to their needs. They thereby completely changed the ecology of large parts of Australia within a few short millennia.

One body of evidence supporting this view is the fossil plant record. Eucalyptus trees were rare in Australia 45,000 years ago. But the arrival of *Homo sapiens* inaugurated a golden age for the species. Since eucalyptuses are particularly resistant to fire, they spread far and wide while other trees and shrubs disappeared.

第二個解釋是，當智人到達澳大利亞時，他們已經掌握了火災農業。面對陌生和威脅性的環境，他們有意燒毀了大片不可通行的灌木叢和茂密的森林，以創造開闊的草原，這些草原吸引了更易狩獵的動物，更適合他們的需求。在短短的數千年內，他們徹底改變了澳大利亞大部分地區的生態。支持這一觀點的證據之一是化石植物紀錄。4.5萬年前，澳大利亞的桉樹很稀少。但智人的到來為這種物種開啟了一個黃金時代。由於桉樹特別耐火，所以它們在其他樹木和灌木消失的同時遍布整個地區。

These changes in vegetation influenced the animals that ate the plants and the carnivores that ate the vegetarians. Koalas, which subsist exclusively on eucalyptus leaves, happily munched their way into new territories. Most other animals suffered greatly. Many Australian food chains collapsed, driving the weakest links into extinction. [5](#)

A third explanation agrees that hunting and fire agriculture played a significant role in the extinction, but emphasises that we can't completely ignore the role of climate. The climate changes that beset Australia about 45,000 years ago destabilised the ecosystem and made it particularly vulnerable. Under normal circumstances the system would probably have recuperated, as had happened many times previously. However, humans appeared on the stage at just this critical juncture and pushed the brittle ecosystem into the abyss. The combination of climate change and human hunting is particularly devastating for large animals, since it attacks them from different angles. It is hard to find a good survival strategy that will work simultaneously against multiple threats.

這些植被的變化影響了吃植物的動物和吃素食的肉食動物。以桉樹叶子為食的考拉快樂地吃進了新的領土。大多數其他動物受到了極大的傷害，許多澳大利亞的食物鏈崩潰，將最薄弱的環節推向了滅絕的邊緣。第三個解釋認為狩獵和火災農業在滅絕中起了重要作用，但強調我們不能完全忽視氣候的作用。大約在45,000年前，澳大利亞所面臨的氣候變化不穩定了生態系統，使其變得特別脆弱。在正常情況下，該系統可能會恢復，就像以前發生過許多次一樣。然而，人類在這個關鍵時刻出現了，將脆弱的生態系統推向了深淵。氣候變化和人類狩獵的結合對大型動物特別具有毀滅性，因為它從不同的角度攻擊它們。很難找到一種有效的生存策略，可以同時對抗多重威脅。

Without further evidence, there's no way of deciding between the three scenarios. But there are certainly good reasons to believe that if *Homo sapiens* had never gone Down Under, it would still be home to marsupial lions, diprotodonts and giant kangaroos.

The End of Sloth

The extinction of the Australian megafauna was probably the first significant mark *Homo sapiens* left on our planet. It was followed by an even larger ecological disaster, this time in America. *Homo sapiens* was the first and only human species to reach the western hemisphere landmass, arriving about 16,000 years ago, that is in or around 14,000 BC. The first Americans arrived on foot, which they could do because, at the time, sea levels were low enough that a land bridge connected north-eastern Siberia with north-western Alaska. Not that it was easy – the journey was an arduous one, perhaps harder than the sea passage to Australia. To make the crossing, Sapiens first had to learn how to withstand the extreme Arctic conditions of northern Siberia, an area on which the sun never shines in winter, and where temperatures can drop to minus fifty degrees Celsius.

沒有進一步的證據，我們無法在這三種情況中做出決定。但有很好的理由相信，如果智人從未到過澳洲，澳洲仍然是有袋獅、雙門齒獸和巨型袋鼠的棲息地。澳洲大型動物的滅絕可能是智人在我們星球上留下的第一個重要標記。接著發生了更大規模的生態災難，這一次發生在美洲。智人是第一個也是唯一一個到達西半球大陸的人類物種，約在1.6萬年前，即公元前1.4萬年左右。最初的美洲人步行而來，因為當時海平面降低，一條陸橋連接了東北西伯利亞和西北阿拉斯加。不是說這很容易——旅程艱辛，也許比去澳洲的海上過程還要難。要完成穿越，智人首先必須學會如何抵禦北方西伯利亞極端的極地條件，在這個冬天永不見陽光，氣溫可降至攝氏零下五十度的地區。

No previous human species had managed to penetrate places like northern Siberia. Even the cold-adapted Neanderthals restricted themselves to relatively warmer regions further south. But *Homo sapiens*, whose body was adapted to living in the African savannah rather than in the lands of snow and ice, devised ingenious solutions. When roaming bands of Sapiens foragers migrated into colder climates, they learned to make snowshoes and effective thermal clothing composed of layers of furs and skins, sewn together tightly with the help of needles. They developed new weapons and sophisticated hunting techniques that enabled them to track and kill mammoths and the other big game of the far north. As their thermal clothing and hunting techniques improved, Sapiens dared to venture deeper and deeper into the frozen regions. And as they moved north, their clothes, hunting strategies and other survival skills continued to improve.

沒有先前的人類物種成功地穿越像北部西伯利亞這樣的地方。即使是適應寒冷的尼安德特人也限制自己在相對較溫暖的南方地區活動。但是，身體適應非洲大草原生活的智人想出了巧妙的解決方案。當智人的流浪獵人群體遷移到更寒冷的氣候時，他們學會了製作雪鞋和由毛皮和皮膚層緊密縫合的有效保溫服裝，並借助針頭進行縫製。他們開發出新的武器和複雜的狩獵技巧，使他們能夠追蹤並殺死猛獁和其他大型遊戲。隨著他們的保溫服裝和狩獵技巧的改進，智人敢於大膽地進入越來越深的凍結區域。隨著他們向北移動，他們的服裝、狩獵策略和其他生存技能也不斷改進。

But why did they bother? Why banish oneself to Siberia by choice? Perhaps some bands were driven north by wars, demographic pressures or natural disasters. Others might have been lured northwards by more positive reasons, such as animal protein. The Arctic lands were full of large, juicy animals such as reindeer and mammoths. Every mammoth was a source of a vast quantity of meat (which, given the frosty temperatures, could even be frozen for later use), tasty fat, warm fur and valuable ivory. As the findings from Sungir testify, mammoth-hunters did not just survive in the frozen north – they thrived. As time passed, the bands spread far and wide, pursuing mammoths, mastodons, rhinoceroses and reindeer. Around 14,000 BC, the chase took some of them from north-eastern Siberia to Alaska. Of course, they didn't know they were discovering a new world. For mammoth and man alike, Alaska was a mere extension of Siberia.

但他們為什麼要麻煩自己？為什麼要選擇自我流放到西伯利亞？也許一些樂團是被戰爭、人口壓力或自然災害逼到北方的。其他人可能被更積極的原因吸引到北方，例如動物蛋白質。北極地區充滿了大型多汁動物，如馴鹿和猛獁象。每頭猛獁象都是巨量肉類的來源（由於低溫，甚至可以冷凍後再使用），美味的脂肪、保暖的毛皮和有價值的象牙。正如Sungir的發現所證明的那樣，獵猛獁象的人並不僅僅在冰封的北方生存下來-他們繁榮了起來。隨著時間的推移，這些樂團遍及世界，追逐猛獁象、乳齒象、犀牛和馴鹿。公元前14,000年左右，一些人從東北西伯利亞前往阿拉斯加。當然，他們不知道他們正在發現一個新世界。對於猛獁象和人類來說，阿拉斯加只不過是西伯利亞的延伸。

At first, glaciers blocked the way from Alaska to the rest of America, allowing no more than perhaps a few isolated pioneers to investigate the lands further south. However, around 12,000 BC global warming melted the ice and opened an easier passage. Making use of the new corridor, people moved south en masse, spreading over the entire continent. Though originally adapted to hunting large game in the Arctic, they soon adjusted to an amazing variety of climates and ecosystems. Descendants of the Siberians settled the thick forests of the eastern United States, the swamps of the Mississippi Delta, the deserts of Mexico and steaming jungles of Central America. Some made their homes in the river world of the Amazon basin, others struck roots in Andean mountain valleys or the open pampas of Argentina. And all this happened in a mere millennium or two! By 10,000 BC, humans already inhabited the most southern point in America, the island of Tierra del Fuego at the continent's southern tip. The human blitzkrieg across America testifies to the incomparable ingenuity and the unsurpassed adaptability of *Homo sapiens*. No other animal had ever moved into such a huge variety of radically different habitats so quickly, everywhere using virtually the same genes.⁶

最初，冰川阻塞了從阿拉斯加到美國其他地區的道路，只允許少數孤立的先驅者調查更南的土地。然而，大約在公元前12,000年，全球變暖融化了冰川，開通了更容易的通道。利用新的走廊，人們大量向南移動，遍布整個大陸。雖然最初適應於在北極地區狩獵大型動物，但他們很快適應了驚人的各種氣候和生態系統。西伯利亞人的後代定居於美國東部的茂密森林，密西西比三角洲的沼澤，墨西哥的沙漠和中美洲的蒸汽叢林。一些人居住在亞馬遜流域的河水世界中，其他人在安第斯山谷或阿根廷的開闊草原上扎根。而且所有這些都在短短的一千年或兩千年內發生了！到公元前10,000年，人類已經居住在美洲最南端的地點——南極洲南端的火地島。人類對整個美洲的閃電戰證明了智人的無比的靈活適應性和無與倫比的靈活性。沒有其他動物能夠如此迅速地進入如此多種顯著不同的棲息地，而且幾乎使用相同的基因。

The settling of America was hardly bloodless. It left behind a long trail of victims. American fauna 14,000 years ago was far richer than it is today. When the first Americans marched south from Alaska into the plains of Canada and the western United States, they encountered mammoths and

mastodons, rodents the size of bears, herds of horses and camels, oversized lions and dozens of large species the likes of which are completely unknown today, among them fearsome sabre-tooth cats and giant ground sloths that weighed up to eight tons and reached a height of six metres. South America hosted an even more exotic menagerie of large mammals, reptiles and birds. The Americas were a great laboratory of evolutionary experimentation, a place where animals and plants unknown in Africa and Asia had evolved and thrived.

美國的開拓遠非一片祥和，它留下了一長串的受害者。一萬四千年前的美洲動物比今天豐富得多。當第一批美國人從阿拉斯加向南進入加拿大平原和西部的美國時，他們遇到了猛犸象和乳齒象、像熊一樣大的齒類、馬和駱駝群、超大型獅子和數十種大型物種，這些物種現在完全不為人知，其中包括可怕的劍齒虎和重達八噸、高達六米的巨型地懶。南美洲則擁有更多異國情調的大型哺乳動物、爬蟲類和鳥類。美洲是進化實驗的巨大實驗室，這是一個非洲和亞洲未知動植物進化和繁榮的地方。

But no longer. Within 2,000 years of the Sapiens arrival, most of these unique species were gone. According to current estimates, within that short interval, North America lost thirty-four out of its forty-seven genera of large mammals. South America lost fifty out of sixty. The sabre-tooth cats, after flourishing for more than 30 million years, disappeared, and so did the giant ground sloths, the oversized lions, native American horses, native American camels, the giant rodents and the mammoths. Thousands of species of smaller mammals, reptiles, birds, and even insects and parasites also became extinct (when the mammoths died out, all species of mammoth ticks followed them to oblivion).

For decades, palaeontologists and zooarchaeologists – people who search for and study animal remains – have been combing the plains and mountains of the Americas in search of the fossilised bones of ancient camels and the petrified faeces of giant ground sloths. When they find what they seek, the treasures are carefully packed up and sent to laboratories, where every bone and every coprolite (the technical name for fossilised turds) is meticulously studied and dated. Time and again, these analyses yield the same results: the freshest dung balls and the most recent camel bones date to the period when

humans flooded America, that is, between approximately 12,000 and 9000 BC. Only in one area have scientists discovered younger dung balls: on several Caribbean islands, in particular Cuba and Hispaniola, they found petrified ground-sloth scat dating to about 5000 BC. This is exactly the time when the first humans managed to cross the Caribbean Sea and settle these two large islands.

但現在已經不是這樣了。自智人到來的2,000年內，大多數獨特的物種都已經消失。根據當前的估計，在這段短暫的時間內，北美失去了其47個大型哺乳動物中的34個屬。南美失去了60個中的50個。利劍虎在繁榮了超過3000萬年後消失了，巨型地面樹獸、過大的獅子、本土美洲馬、本土美洲駱駝、巨型啮齒動物和猛犸象也同樣消失了。數千種小型哺乳動物、爬蟲類、鳥類，甚至昆蟲和寄生蟲也已滅絕（當猛犸象滅絕時，所有的猛犸象蟬也隨之湮滅）。數十年來，古生物學家和動物遺骸研究員——尋找和研究動物遺骸的人——一直在美洲的平原和山區搜尋古代駱駝的化石骨骼和巨型樹獸的石化糞便。當他們找到他們所尋找的東西時，這些寶藏便會被小心地打包，送到實驗室，每根骨頭和每個石化的糞便（化石便便的技術名稱）都會被仔細地研究和確定年代。一次又一次，這些分析結果都是相同的：最新鮮的糞球和最近的駱駝骨骼的年代都可以追溯到人類湧入美洲的時期，即公元前12,000年至公元前9000年左右。只有在一個地區，科學家發現了更新的糞球：在幾個加勒比島嶼，特別是古巴和海地，他們發現了大約公元前5000年的石化地面樹獸的糞便。這正是人類第一次成功渡過加勒比海並定居這兩個大島的時間。

Again, some scholars try to exonerate *Homo sapiens* and blame climate change (which requires them to posit that, for some mysterious reason, the climate in the Caribbean islands remained static for 7,000 years while the rest of the western hemisphere warmed). But in America, the dung ball cannot be dodged. We are the culprits. There is no way around that truth. Even if climate change abetted us, the human contribution was decisive. ⁷

Noah's Ark

If we combine the mass extinctions in Australia and America, and add the smaller-scale extinctions that took place as *Homo sapiens* spread over Afro-

Asia – such as the extinction of all other human species – and the extinctions that occurred when ancient foragers settled remote islands such as Cuba, the inevitable conclusion is that the first wave of Sapiens colonisation was one of the biggest and swiftest ecological disasters to befall the animal kingdom. Hardest hit were the large furry creatures. At the time of the Cognitive Revolution, the planet was home to about 200 genera of large terrestrial mammals weighing over fifty kilograms. At the time of the Agricultural Revolution, only about a hundred remained. *Homo sapiens* drove to extinction about half of the planet's big beasts long before humans invented the wheel, writing, or iron tools.

一些學者試圖開脫智人的罪責，並歸咎於氣候變化（這需要他們假定，出現了某種神秘的原因，加勒比島的氣候在七千年間保持不變，而其他地區的西半球則變暖）。但在美洲，這個真相是無法迴避的。我們是罪犯。這個事實是無法規避的，即使氣候變化幫助了我們，人類的貢獻也是決定性的。如果我們結合澳大利亞和美國的大規模滅絕，以及智人擴散到非洲和亞洲時發生的較小規模的滅絕 - 如所有其他人種的滅絕 - 以及當古代狩獵者定居遠離的小島，如古巴時發生的滅絕，必然的結論是智人殖民浪潮是動物王國一個最大和最迅速的生態災難之一。首當其衝的是那些毛茸茸的巨型動物。在認知革命時期，地球上約有200個重量超過50公斤的大型陸生哺乳動物。在農業革命時期，只有約100種存活下來。在人類發明輪子、寫作或鐵器之前，智人已經把全球約一半的大型動物消滅了。

This ecological tragedy was restaged in miniature countless times after the Agricultural Revolution. The archaeological record of island after island tells the same sad story. The tragedy opens with a scene showing a rich and varied population of large animals, without any trace of humans. In scene two, Sapiens appear, evidenced by a human bone, a spear point, or perhaps a potsherd. Scene three quickly follows, in which men and women occupy centre stage and most large animals, along with many smaller ones, are gone.

The large island of Madagascar, about 400 kilometres east of the African mainland, offers a famous example. Through millions of years of isolation, a unique collection of animals evolved there. These included the elephant bird, a flightless creature three metres tall and weighing almost half a ton – the largest bird in the world – and the giant lemurs, the globe's largest primates.

The elephant birds and the giant lemurs, along with most of the other large animals of Madagascar, suddenly vanished about 1,500 years ago – precisely when the first humans set foot on the island.

農業革命之後，這種生態悲劇在無數次被在小型事件中重演。島嶼與考古學紀錄均講述著同樣令人悲傷的故事。此悲劇開始於一個展示豐富多樣、人類蹤跡全無的大型動物族群的場景，接著出現人類的骨頭、矛頭，或者是破片等物品。第三幕很快展開，人們登上中心舞台，但大多數的大型動物以及許多小型動物卻消失了。大型島嶼馬達加斯加島，位於非洲大陸東方約400公里處，提供了一個著名的例子。經過上百萬年的孤立發展，島上具有獨特進化的動植物。包括三米高，重達半噸，是世界上最大的鳥類—以及世界上最大的靈長類，古怪的大樹狐猴。這些動物群與驚人的其他大型動物，在約1500年前第一批人類登陸島嶼之後突然消失了。



10. Reconstructions of two giant ground sloths (*Megatherium*) and behind them two giant armadillos (*Glyptodon*). Now extinct, giant armadillos measured over three metres in length and weighed up to two tons, whereas giant ground sloths reached heights of up to six metres, and weighed up to eight tons .

In the Pacific Ocean, the main wave of extinction began in about 1500 BC , when Polynesian farmers settled the Solomon Islands, Fiji and New Caledonia. They killed off, directly or indirectly, hundreds of species of birds, insects, snails and other local inhabitants. From there, the wave of extinction moved gradually to the east, the south and the north, into the heart of the Pacific Ocean, obliterating on its way the unique fauna of Samoa and Tonga (1200 BC); the Marquis Islands (AD 1); Easter Island, the Cook Islands and Hawaii (AD 500); and finally New Zealand (AD 1200).

10. 兩隻巨型地面樹懶（*Megatherium*）的重建，它們背後有兩隻巨型犰狳（*Glyptodon*）。現已滅絕，巨型犰狳長度超過三米，重達兩噸；而巨型地面樹懶高度可達六米，重達八噸。在太平洋上，滅絕浪潮的主要開始於公元前1500年左右，當波利尼西亞農民在所羅門群島、斐濟和新喀里多尼亞定居時。他們直接或間接地殺害了數百種鳥類、昆蟲、蝸牛和其他當地居民。從那里開始，滅絕浪潮逐漸向東、南和北移動，進入太平洋的中心，摧毀了薩摩亞和湯加（公元前1200年）的獨特動物相；馬爾克斯群島（公元1年）；復活節島、庫克群島和夏威夷（公元500年）；最後是新西蘭（公元1200年）。

Similar ecological disasters occurred on almost every one of the thousands of islands that pepper the Atlantic Ocean, Indian Ocean, Arctic Ocean and Mediterranean Sea. Archaeologists have discovered on even the tiniest islands evidence of the existence of birds, insects and snails that lived there for countless generations, only to vanish when the first human farmers arrived. None but a few extremely remote islands escaped man's notice until the modern age, and these islands kept their fauna intact. The Galapagos Islands, to give one famous example, remained uninhabited by humans until the nineteenth century, thus preserving their unique menagerie, including their giant tortoises, which, like the ancient diprotodonts, show no fear of humans.

The First Wave Extinction, which accompanied the spread of the foragers, was followed by the Second Wave Extinction, which accompanied the spread of the farmers, and gives us an important perspective on the Third Wave Extinction, which industrial activity is causing today. Don't believe tree-huggers who claim that our ancestors lived in harmony with nature. Long before the Industrial Revolution, *Homo sapiens* held the record among all organisms for driving the most plant and animal species to their extinctions.

We have the dubious distinction of being the deadliest species in the annals of biology.

大西洋、印度洋、北冰洋和地中海遍布數千個小島，幾乎每一個小島上都發生了類似的生態災難。考古學家在最小的島嶼上發現了鳥類、昆蟲和蝸牛的存在證據，它們曾經在那裡生活了無數個世代，但當第一批農民到來時就消失了。除了一些非常偏遠的小島外，現代以前幾乎所有島嶼都未能逃脫人類的注意，這些島嶼保留了它們的動物群落。著名的加拉帕戈斯群島就是一個例子，直到19世紀人類才開始居住，因此保護了當地的巨型龜，就像古代恐懼獸一樣，它們對人類毫不畏懼。第一波滅絕伴隨著狩獵者的擴散而來，第二波滅絕則伴隨著農民的擴散而到來，這為我們對當今工業活動引起的第三波滅絕提供了重要的觀點。不要相信那些聲稱我們的祖先與自然和諧相處的生態主義者。在工業革命之前，智人在驅使最多的植物和動物物種滅絕方面，是所有生物中的紀錄保持者。我們有著生物學史上最致命物種的可疑殊榮。

Perhaps if more people were aware of the First Wave and Second Wave extinctions, they'd be less nonchalant about the Third Wave they are part of. If we knew how many species we've already eradicated, we might be more motivated to protect those that still survive. This is especially relevant to the large animals of the oceans. Unlike their terrestrial counterparts, the large sea animals suffered relatively little from the Cognitive and Agricultural Revolutions. But many of them are on the brink of extinction now as a result of industrial pollution and human overuse of oceanic resources. If things continue at the present pace, it is likely that whales, sharks, tuna and dolphins will follow the diprotodonts, ground sloths and mammoths to oblivion. Among all the world's large creatures, the only survivors of the human flood will be humans themselves, and the farmyard animals that serve as galley slaves in Noah's Ark.

或許如果更多人了解第一波和第二波滅絕，他們對於他們所在的第三波滅絕就不會這麼漠不關心。如果我們知道我們已經消滅了多少物種，我們可能會更有動力保護那些仍然生存的物種。這對於海洋中的大型動物尤其重要。與陸地上的同類相比，大型海洋動物在認知和農業革命中受到的傷害相對較少。但由於工業污染和人類過度利用海洋資源的影響，許多物種現在處於滅絕的邊緣。如果現在的速度持續下

去，鯨魚、鯊魚、金槍魚和海豚很可能會像雙門齒獸、地懶和猛獁象一樣消失。在世界上所有大型生物中，唯一的倖存者是人類本身和作為挽機奴隸的農場動物。

Part Two

The Agricultural Revolution



11. A wall painting from an Egyptian grave, dated to about 3,500 years ago, depicting typical agricultural scenes .

11. 一幅來自約3500年前的埃及墓中壁畫，描繪了典型的農業場景。

5

History's Biggest Fraud

FOR 2.5 MILLION YEARS HUMANS FED themselves by gathering plants and hunting animals that lived and bred without their intervention. *Homo erectus*, *Homo ergaster* and the Neanderthals plucked wild figs and hunted wild sheep without deciding where fig trees would take root, in which meadow a herd of sheep should graze, or which billy goat would inseminate which nanny goat. *Homo sapiens* spread from East Africa to the Middle East, to Europe and Asia, and finally to Australia and America – but everywhere they went, Sapiens too continued to live by gathering wild plants and hunting wild animals. Why do anything else when your lifestyle feeds you amply and supports a rich world of social structures, religious beliefs and political dynamics?

All this changed about 10,000 years ago, when Sapiens began to devote almost all their time and effort to manipulating the lives of a few animal and plant species. From sunrise to sunset humans sowed seeds, watered plants, plucked weeds from the ground and led sheep to prime pastures. This work, they thought, would provide them with more fruit, grain and meat. It was a revolution in the way humans lived – the Agricultural Revolution.

人類在過去的2.5百萬年中，靠著採集植物和狩獵野生動物來維持生計，這些動植物不需要他們的干預就會自行生長繁殖。直到舊石器時代的「直立人」、「手腕人」和尼安德特人，仍然採摘野生無花果，狩獵野羊，卻不需考量哪些區域適合種植無花果、哪些牧場有足夠的草地餵養羊群，以及哪隻公山羊要配種哪隻母山羊。智人從東非擴散到中東、歐洲及亞洲，最後達到了澳洲和美洲。然而，哪裡都是一樣的，智人繼續以採集野生植物和狩獵野生動物的方式維生，這種生活方式提供了豐富的社會結構、宗教信仰和政治動態，並且能夠安居樂業。但這種生活方式在一萬年前突然改變，當時智人開始將時間和精力投入到操控少數動植物的生命上。從清晨到傍晚，人們都在種植作

物、澆水、除草，引領羊隻到最佳的牧場。他們認為這樣可以獲得更多的水果、穀物和肉類，這是一個人類生活的革命——農業革命。

The transition to agriculture began around 9500–8500 BC in the hill country of south-eastern Turkey, western Iran, and the Levant. It began slowly and in a restricted geographical area. Wheat and goats were domesticated by approximately 9000 BC ; peas and lentils around 8000 BC ; olive trees by 5000 BC ; horses by 4000 BC ; and grapevines in 3500 BC . Some animals and plants, such as camels and cashew nuts, were domesticated even later, but by 3500 BC the main wave of domestication was over. Even today, with all our advanced technologies, more than 90 per cent of the calories that feed humanity come from the handful of plants that our ancestors domesticated between 9500 and 3500 BC – wheat, rice, maize (called ‘corn’ in the US), potatoes, millet and barley. No noteworthy plant or animal has been domesticated in the last 2,000 years. If our minds are those of hunter-gatherers, our cuisine is that of ancient farmers.

大約在公元前9500至8500年間，農業轉變開始在土耳其東南部山區、伊朗西部和黎凡特地區進行。它開始得很緩慢，並且在一個有限的地理區域內進行。大約在公元前9000年左右，小麥和山羊被馴化；豌豆和扁豆大約在公元前8000年；橄欖樹在公元前5000年；馬在公元前4000年；葡萄藤在公元前3500年。有些動物和植物，如駱駝和腰果，甚至更晚才被馴化，但到公元前3500年為止，主要的馴化浪潮已經結束。即使今天，擁有先進技術的人們，給人類提供營養的超過90%的熱量仍來自於我們的祖先在公元前9500至3500年間馴化的少數植物 - 小麥、稻米、玉米（在美國稱為“corn”）、馬鈴薯、小米和大麥。在過去的2000年中，沒有值得注意的植物或動物被馴化。如果我們的思維方式來自於狩獵採集者，那麼我們的菜肴便是古老的農民菜肴。

Scholars once believed that agriculture spread from a single Middle Eastern point of origin to the four corners of the world. Today, scholars agree that agriculture sprang up in other parts of the world not by the action of Middle Eastern farmers exporting their revolution but entirely independently. People in Central America domesticated maize and beans without knowing anything about wheat and pea cultivation in the Middle East. South Americans learned how to raise potatoes and llamas, unaware of what was going on in either Mexico or the Levant. Chinas first revolutionaries domesticated rice, millet

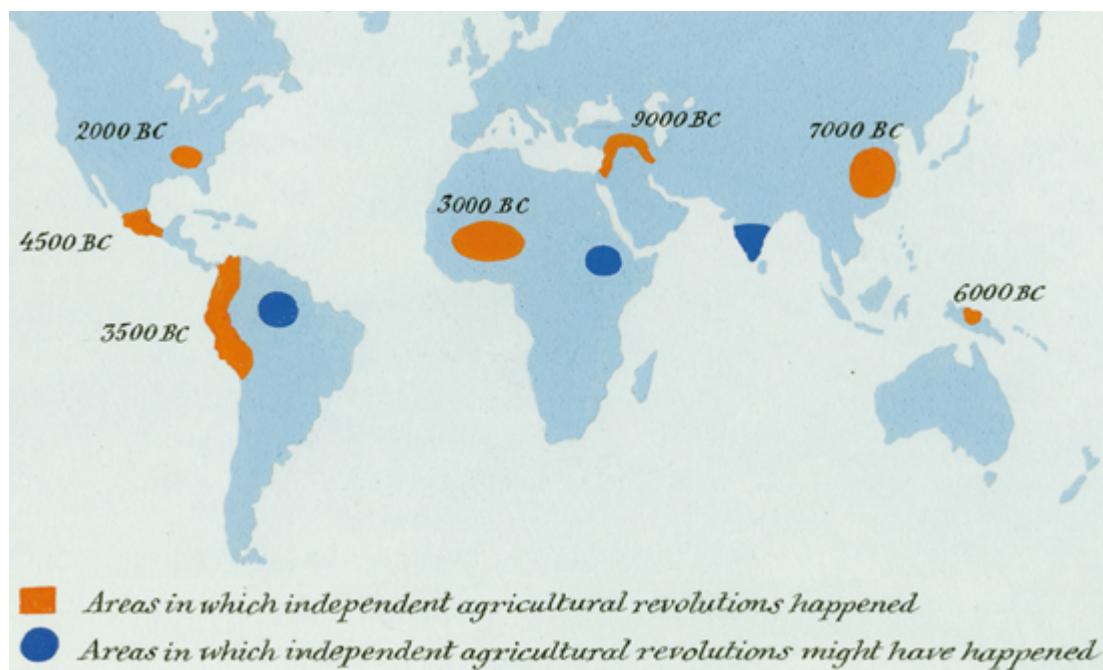
and pigs. North America's first gardeners were those who got tired of combing the undergrowth for edible gourds and decided to cultivate pumpkins. New Guineans tamed sugar cane and bananas, while the first West African farmers made African millet, African rice, sorghum and wheat conform to their needs. From these initial focal points, agriculture spread far and wide. By the first century AD the vast majority of people throughout most of the world were agriculturists.

學者曾一度認為農業源自於中東單一起源點，並傳到世界四方。如今，學者們普遍認同，農業也同時在其他世界各地萌芽，這完全不是中東農民輸出自己的革命所致。中美洲人民在不了解中東小麥和豌豆栽培的情況下馴養了玉米和豆類。南美人學會了如何飼養馬鈴薯和羊駝，對於墨西哥或黎凡特地區究竟發生了什麼，他們一無所知。中國早期「革命者」，則馴化了水稻、谷子和豬。北美的首批園丁，是那些厭倦在草叢中搜尋可食用的西葫蘆，決定種植南瓜。新幾內亞人馴服了甘蔗和香蕉，而非洲西部的第一批農民將非洲小米、非洲米、高粱和小麥改良符合他們的需求。從這些最初的焦點開始，農業廣泛傳播。公元1世紀，世界大部分地區的大多數人都是農民。

Why did agricultural revolutions erupt in the Middle East, China and Central America but not in Australia, Alaska or South Africa? The reason is simple: most species of plants and animals can't be domesticated. Sapiens could dig up delicious truffles and hunt down woolly mammoths, but domesticating either species was out of the question. The fungi were far too elusive, the giant beasts too ferocious. Of the thousands of species that our ancestors hunted and gathered, only a few were suitable candidates for farming and herding. Those few species lived in particular places, and those are the places where agricultural revolutions occurred.

Scholars once proclaimed that the agricultural revolution was a great leap forward for humanity. They told a tale of progress fuelled by human brain power. Evolution gradually produced ever more intelligent people. Eventually, people were so smart that they were able to decipher nature's secrets, enabling them to tame sheep and cultivate wheat. As soon as this happened, they cheerfully abandoned the gruelling, dangerous, and often spartan life of hunter-gatherers, settling down to enjoy the pleasant, satiated life of farmers.

為什麼農業革命在中東、中國和中美洲爆發，但在澳大利亞、阿拉斯加或南非卻沒有呢？原因很簡單：大多數植物和動物物種無法馴化。智人可以挖出美味的松露和狩獵毛茸茸的猛獸，但馴化這兩種物種是不可能的。菇類太難尋找，巨獸太兇猛。在我們的祖先獵殺和採集的成千上萬種物種中，只有少數適合耕種和養殖。這些物種生活在特定的地方，這些地方就是農業革命發生的地方。學者曾經宣稱，農業革命對人類來說是巨大的飛躍。他們講述了一個由人類智力驅動的進步故事。演化逐漸產生了越來越聰明的人，最終，人們很聰明，能夠解密自然的秘密，使他們能夠馴化羊和栽培小麥。一旦發生這種情況，他們就開心地放棄了獵人采集者辛苦、危險且常常清苦的生活，安定下來享受舒適、飽腹的農民生活。



Map 2. Locations and dates of agricultural revolutions. The data is contentious, and the map is constantly being redrawn to incorporate the latest archaeological discoveries .¹

That tale is a fantasy. There is no evidence that people became more intelligent with time. Foragers knew the secrets of nature long before the Agricultural Revolution, since their survival depended on an intimate knowledge of the animals they hunted and the plants they gathered. Rather than heralding a new era of easy living, the Agricultural Revolution left

farmers with lives generally more difficult and less satisfying than those of foragers. Hunter-gatherers spent their time in more stimulating and varied ways, and were less in danger of starvation and disease. The Agricultural Revolution certainly enlarged the sum total of food at the disposal of humankind, but the extra food did not translate into a better diet or more leisure. Rather, it translated into population explosions and pampered elites. The average farmer worked harder than the average forager, and got a worse diet in return. The Agricultural Revolution was history's biggest fraud.²

圖2. 農業革命的地點和日期。數據存在爭議，該地圖在不斷重新繪制以包容最新的考古發現。1 這個故事是一個幻想。沒有證據顯示人類隨著時間變得更聰明。狩獵採集者在農業革命前就已知道大自然的秘密，因為他們的生存取決於對狩獵的動物和採集的植物有親密的了解。農業革命並沒有預示著一個輕鬆生活的新時代，反而讓農民的生活通常比狩獵採集者更加困難且不如意。狩獵採集者的生活方式更加刺激和多樣化，而且不太會面臨饑餓和疾病的危險。農業革命確實擴大了人類可以使用的總食物量，但額外的食物並沒有轉化為更好的飲食或更多的閒暇時間。相反，這轉化為人口激增和嬌生慣養的精英階層。平均農民比平均狩獵採集者工作更辛苦，而獲得的飲食回報更差。農業革命是歷史上最大的騙局。2

Who was responsible? Neither kings, nor priests, nor merchants. The culprits were a handful of plant species, including wheat, rice and potatoes. These plants domesticated *Homo sapiens*, rather than vice versa.

Think for a moment about the Agricultural Revolution from the viewpoint of wheat. Ten thousand years ago wheat was just a wild grass, one of many, confined to a small range in the Middle East. Suddenly, within just a few short millennia, it was growing all over the world. According to the basic evolutionary criteria of survival and reproduction, wheat has become one of the most successful plants in the history of the earth. In areas such as the Great Plains of North America, where not a single wheat stalk grew 10,000 years ago, you can today walk for hundreds upon hundreds of kilometres without encountering any other plant. Worldwide, wheat covers about 2.25 million square kilometres of the globe's surface, almost ten times the size of Britain. How did this grass turn from insignificant to ubiquitous?

負責的是誰？既不是國王、祭司，也不是商人。罪魁禍首是一些植物物種，包括小麥、米和馬鈴薯。這些植物馴服了智人，而不是相反。讓我們從小麥的角度思考農業革命。一萬年前，小麥只是一種野生草，和其他許多野草一樣，局限於中東的一小塊範圍內。突然地，在短短的幾千年內，小麥就在世界各地生長開來。根據生存和繁殖的基本進化標準，小麥已經成為地球史上最成功的植物之一。在諸如北美大平原這樣的地區，一萬年前沒有一根小麥的地方，如今可以在數百公里的區域裡走來走去，卻不會遇到其他任何植物。在全球範圍內，小麥佔地約225萬平方公里，幾乎是英國面積的十倍。這種草是如何從微不足道變成無所不在的？

Wheat did it by manipulating *Homo sapiens* to its advantage. This ape had been living a fairly comfortable life hunting and gathering until about 10,000 years ago, but then began to invest more and more effort in cultivating wheat. Within a couple of millennia, humans in many parts of the world were doing little from dawn to dusk other than taking care of wheat plants. It wasn't easy. Wheat demanded a lot of them. Wheat didn't like rocks and pebbles, so Sapiens broke their backs clearing fields. Wheat didn't like sharing its space, water and nutrients with other plants, so men and women laboured long days weeding under the scorching sun. Wheat got sick, so Sapiens had to keep a watch out for worms and blight. Wheat was defenceless against other organisms that liked to eat it, from rabbits to locust swarms, so the farmers had to guard and protect it. Wheat was thirsty, so humans lugged water from springs and streams to water it. Its hunger even impelled Sapiens to collect animal faeces to nourish the ground in which wheat grew.

小麥通過操縱智人為自己帶來了好處。約一萬年前，這種類猿一直過著舒適的狩獵和採集生活，但之後開始投入越來越多的精力來種植小麥。幾千年來，世界上許多地方的人們從早到晚都在照顧小麥，而很少做其他事情。這不是一件容易的事情，小麥對人類要求很高。小麥不喜歡石頭和卵石，所以智人們得清理田地。小麥不喜歡同其他植物分享空間、水和營養，所以男女們在炎熱的太陽下長時間地除草。小麥會生病，所以智人們必須警戒蟲害和病害。小麥對其他喜歡吃它的生物毫無防禦能力，從兔子到蝗蟲群，所以農民們必須保護它。小麥渴了，所以人類從泉水和小溪中搬運水來澆灌它。它的飢餓甚至促使智人們收集動物糞來滋養小麥生長的土地。

The body of *Homo sapiens* had not evolved for such tasks. It was adapted to climbing apple trees and running after gazelles, not to clearing rocks and carrying water buckets. Human spines, knees, necks and arches paid the price. Studies of ancient skeletons indicate that the transition to agriculture brought about a plethora of ailments, such as slipped discs, arthritis and hernias. Moreover, the new agricultural tasks demanded so much time that people were forced to settle permanently next to their wheat fields. This completely changed their way of life. We did not domesticate wheat. It domesticated us. The word ‘domesticate’ comes from the Latin *domus*, which means ‘house’. Who’s the one living in a house? Not the wheat. It’s the Sapiens.

How did wheat convince *Homo sapiens* to exchange a rather good life for a more miserable existence? What did it offer in return? It did not offer a better diet. Remember, humans are omnivorous apes who thrive on a wide variety of foods. Grains made up only a small fraction of the human diet before the Agricultural Revolution. A diet based on cereals is poor in minerals and vitamins, hard to digest, and really bad for your teeth and gums.

人類的身體並沒有進化到做這些工作的程度。人的身體是適應爬蘋果樹和追捕瞪羚的，而不是清除岩石和提水桶的。人類的脊椎、膝蓋、頸部和拱門付出了代價。對古代骨骼的研究表明，轉向農業帶來了許多疾病，如椎間盤突出、關節炎和疝氣。此外，新的農業任務需要大量時間，人們被迫永久定居在麥田旁。這完全改變了他們的生活方式。我們沒有馴服小麥，是小麥馴服了我們。“馴服”一詞來自拉丁語 *domus*，意思是“房子”。誰住在房子裡？不是小麥。是智人。小麥如何說服智人為了更悲慘的生活放棄了相對不錯的生活？它提供了什麼回報？它並沒有提供更好的飲食。請記住，人類是雜食性大猩猩，能夠在各種食物上茁壯成長。在農業革命之前，穀物只占人類飲食的一小部分。以穀物為基礎的飲食缺乏礦物質和維生素，難以消化，對牙齒和牙齦非常不利。

Wheat did not give people economic security. The life of a peasant is less secure than that of a hunter-gatherer. Foragers relied on dozens of species to survive, and could therefore weather difficult years even without stocks of preserved food. If the availability of one species was reduced, they could gather and hunt more of other species. Farming societies have, until very

recently, relied for the great bulk of their calorie intake on a small variety of domesticated plants. In many areas, they relied on just a single staple, such as wheat, potatoes or rice. If the rains failed or clouds of locusts arrived or if a fungus learned how to infect that staple species, peasants died by the thousands and millions.

Nor could wheat offer security against human violence. The early farmers were at least as violent as their forager ancestors, if not more so. Farmers had more possessions and needed land for planting. The loss of pasture land to raiding neighbours could mean the difference between subsistence and starvation, so there was much less room for compromise. When a foraging band was hard-pressed by a stronger rival, it could usually move on. It was difficult and dangerous, but it was feasible. When a strong enemy threatened an agricultural village, retreat meant giving up fields, houses and granaries. In many cases, this doomed the refugees to starvation. Farmers, therefore, tended to stay put and fight to the bitter end.

小麥不能提供人們經濟保障。農民的生活比狩獵採集者不安全。採集者依賴許多物種以求生存，即使沒有儲存的食物，他們仍能度過困難的年月。如果一種物種減少了，他們可以收集和狩獵更多其他物種。直到最近，農耕社會在極大部分的卡路里攝入上仍主要依賴一小部分的馴化植物。在許多地區，他們僅依賴單一作物，例如小麥，馬鈴薯或米。如果降雨不足，蝗蟲成災或真菌學會感染該主食作物，農民就會死亡成千上萬甚至數百萬人。小麥也不能提供安全抵禦人類暴力的方式。早期的農民至少和他們的採集祖先一樣暴力，甚至更為兇猛。農民擁有更多財物，需要用地種植。失去牧場的掠奪者可能意味著維生和飢餓之間的差別，因此讓步的空間更小。當野外集團被更強大的競爭對手逼迫到絕境時，他們通常可以轉移。這很困難和危險，但是卻是可行的。當一個強大的敵人威脅一個農村時，撤退意味著放棄田地、房屋和倉庫。在許多情況下，這註定了難民的饑餓命運。因此，農民傾向於留在原地並戰鬥到最後一刻。



12. Tribal warfare in New Guinea between two farming communities (1960). Such scenes were probably widespread in the thousands of years following the Agricultural Revolution .

Many anthropological and archaeological studies indicate that in simple agricultural societies with no political frameworks beyond village and tribe, human violence was responsible for about 15 per cent of deaths, including 25 per cent of male deaths. In contemporary New Guinea, violence accounts for 30 per cent of male deaths in one agricultural tribal society, the Dani, and 35 per cent in another, the Enga. In Ecuador, perhaps 50 per cent of adult Waorani meet a violent death at the hands of another human! ³ In time, human violence was brought under control through the development of larger social frameworks – cities, kingdoms and states. But it took thousands of years to build such huge and effective political structures.

12. 紐幾內亞兩個農耕社區之間的部落戰爭（1960）。在農業革命後的數千年中，此類場景可能是普遍存在的。許多人類學和考古研究表明，在沒有超越村莊和部落的政治框架的簡單農業社會中，人類暴力造成了大約15%的死亡，其中男性死亡率為25%。在當代紐幾內亞，暴力導致一個農業部落社會的男性死亡率達30%，另一個恩加部落則

為35%。在厄瓜多爾，也許有50%的成年瓦奧拉尼人死於另一個人的手中！在時間的推移中，通過發展更大的社會框架-城市，王國和國家-人類暴力得到了控制。但要建立如此龐大而有效的政治結構需要數千年的時間。

Village life certainly brought the first farmers some immediate benefits, such as better protection against wild animals, rain and cold. Yet for the average person, the disadvantages probably outweighed the advantages. This is hard for people in today's prosperous societies to appreciate. Since we enjoy affluence and security, and since our affluence and security are built on foundations laid by the Agricultural Revolution, we assume that the Agricultural Revolution was a wonderful improvement. Yet it is wrong to judge thousands of years of history from the perspective of today. A much more representative viewpoint is that of a three-year-old girl dying from malnutrition in first-century China because her father's crops have failed. Would she say 'I am dying from malnutrition, but in 2,000 years, people will have plenty to eat and live in big air-conditioned houses, so my suffering is a worthwhile sacrifice'?

村落生活肯定為最初的農民帶來了一些立即的好處，例如對野生動物、雨和寒冷的更好保護。然而，對於普通人來說，缺點可能超過了優點。這對現今富裕的社會來說很難理解。由於我們享受豐富和安全，而我們的豐富和安全是建立在農業革命奠定的基礎上的，我們認為農業革命是一個美好的進步。然而，從今天的角度去判斷數千年的歷史是錯誤的。一個更加代表性的觀點是一個三歲女孩在一世紀中國因她父親的作物失敗而死於營養不良。她會說：“我正在因營養不良而死亡，但2000年後，人們會有足夠的食物，住在大空調房子裡，所以我的痛苦是值得的犧牲嗎？”。

What then did wheat offer agriculturists, including that malnourished Chinese girl? It offered nothing for people as individuals. Yet it did bestow something on *Homo sapiens* as a species. Cultivating wheat provided much more food per unit of territory, and thereby enabled *Homo sapiens* to multiply exponentially. Around 13,000 BC, when people fed themselves by gathering wild plants and hunting wild animals, the area around the oasis of Jericho, in Palestine, could support at most one roaming band of about a hundred relatively healthy and well-nourished people. Around 8500 BC, when wild

plants gave way to wheat fields, the oasis supported a large but cramped village of 1,000 people, who suffered far more from disease and malnourishment.

The currency of evolution is neither hunger nor pain, but rather copies of DNA helixes. Just as the economic success of a company is measured only by the number of dollars in its bank account, not by the happiness of its employees, so the evolutionary success of a species is measured by the number of copies of its DNA. If no more DNA copies remain, the species is extinct, just as a company without money is bankrupt. If a species boasts many DNA copies, it is a success, and the species flourishes. From such a perspective, 1,000 copies are always better than a hundred copies. This is the essence of the Agricultural Revolution: the ability to keep more people alive under worse conditions.

那麼，小麥對農民有什麼貢獻呢，包括那個營養不良的中國女孩？對個體而言，它並沒有什麼貢獻。然而，它確實對智人這個物種有所貢獻。種植小麥每單位土地的產量大大提高，這使得智人能夠成倍增長。公元前13000年，人們通過採集野生植物和狩獵野生動物來維持生計，巴勒斯坦耶利哥沙漠綠洲周圍的區域最多只能支持一百個相對健康和營養充足的遊牧部落。但到了公元前8500年，野生植物被小麥田所取代，該綠洲可以支持一個擁擠的1,000人大村莊，但村民卻遭受更多的疾病和營養不良的折磨。進化的貨幣不是飢餓或痛苦，而是DNA雙螺旋的拷貝數量。就像一家公司的經濟成功只有銀行帳戶里的美元數量才能衡量，而不是員工的幸福感，一個物種的進化成功也是通過其DNA的複製數量來衡量的。如果沒有更多的DNA複本，該物種就會滅絕，就像一家沒有錢的公司宣告破產一樣。如果一個物種擁有許多的DNA複本，那它就是成功的，該物種也能茁壯成長。從這樣一個角度來看，1,000個複本永遠比一百個複本好。這就是農業革命的本質：能夠在更糟的條件下讓更多的人活下來。

Yet why should individuals care about this evolutionary calculus? Why would any sane person lower his or her standard of living just to multiply the number of copies of the *Homo sapiens* genome? Nobody agreed to this deal: the Agricultural Revolution was a trap.

The Luxury Trap

The rise of farming was a very gradual affair spread over centuries and millennia. A band of *Homo sapiens* gathering mushrooms and nuts and hunting deer and rabbit did not all of a sudden settle in a permanent village, ploughing fields, sowing wheat and carrying water from the river. The change proceeded by stages, each of which involved just a small alteration in daily life.

Homo sapiens reached the Middle East around 70,000 years ago. For the next 50,000 years our ancestors flourished there without agriculture. The natural resources of the area were enough to support its human population. In times of plenty people had a few more children, and in times of need a few less. Humans, like many mammals, have hormonal and genetic mechanisms that help control procreation. In good times females reach puberty earlier, and their chances of getting pregnant are a bit higher. In bad times puberty is late and fertility decreases.

為什麼人們要關心這個演化計算？任何理智的人為什麼要降低自己的生活水平，僅僅為了繁殖*Homo sapiens*基因的複製數量？沒有人同意這樣的交易：農業革命是一個陷阱。農業的興起是一個非常漸進的過程，持續了數世紀和數千年。一群采摘蘑菇和堅果，狩獵鹿和兔子的*Homo sapiens*突然定居在一個永久性村莊，犁田種麥，從河中取水。這個轉變是逐步進行的，每個階段都涉及日常生活的微小改變。

*Homo sapiens*在約70,000年前到達中東。在接下來的50,000年中，我們的祖先在那裡繁榮，沒有農業。該地區的自然資源足以支持其人口。在豐盛的時期，人們生幾個孩子，在需要的時候，就少生一些。人類和許多哺乳動物一樣，擁有可以幫助控制生殖的荷爾蒙和基因機制。在好時候，女性早熟，懷孕的可能性略高。在不好的時候，青春期較晚，生育能力下降。

To these natural population controls were added cultural mechanisms. Babies and small children, who move slowly and demand much attention, were a burden on nomadic foragers. People tried to space their children three to four years apart. Women did so by nursing their children around the clock and until a late age (around-the-clock suckling significantly decreases

the chances of getting pregnant). Other methods included full or partial sexual abstinence (backed perhaps by cultural taboos), abortions and occasionally infanticide.⁴

During these long millennia people occasionally ate wheat grain, but this was a marginal part of their diet. About 18,000 years ago, the last ice age gave way to a period of global warming. As temperatures rose, so did rainfall. The new climate was ideal for Middle Eastern wheat and other cereals, which multiplied and spread. People began eating more wheat, and in exchange they inadvertently spread its growth. Since it was impossible to eat wild grains without first winnowing, grinding and cooking them, people who gathered these grains carried them back to their temporary campsites for processing. Wheat grains are small and numerous, so some of them inevitably fell on the way to the campsite and were lost. Over time, more and more wheat grew along favourite human trails and near campsites.

自然的族群控制加上文化機制：在游牧族獵人之間，緩慢行動且需要注意的嬰兒和小孩造成了負擔。人們試圖使他們的孩子每三到四年才生一個。透過全天哺乳，並且持續到較晚的年齡（全天哺乳可以明顯地減少懷孕幾率），女性實踐這種計畫。其他方法包括徹底或部分節欲（支持部分文化禁忌），墮胎和偶爾的殺嬰。在這幾千年中，人們偶爾食用小麥谷物，但這只是他們飲食的邊緣部分。大約在18,000年前，最後一個冰河時期轉變為全球暖化時期。隨著溫度上升，降雨量也增加。新氣候非常適合中東小麥和其他穀物的生長，於是乎它們大量繁殖和擴散。人們開始食用更多的小麥，並交換地無意中促進其生長。因為無法食用野生穀物，必須先簸揚、研磨和煮熟，所以那些收集這些穀物的人會將它們攜回臨時營地進行處理。小麥的種子又小又多，因此其中一些在前往營地的途中不可避免地掉落和遺失。隨著時間的推移，越來越多的小麥生長在喜愛的人類小徑和營地附近。

When humans burned down forests and thickets, this also helped wheat. Fire cleared away trees and shrubs, allowing wheat and other grasses to monopolise the sunlight, water and nutrients. Where wheat became particularly abundant, and game and other food sources were also plentiful, human bands could gradually give up their nomadic lifestyle and settle down in seasonal and even permanent camps.

At first they might have camped for four weeks during the harvest. A generation later, as wheat plants multiplied and spread, the harvest camp might have lasted for five weeks, then six, and finally it became a permanent village. Evidence of such settlements has been discovered throughout the Middle East, particularly in the Levant, where the Natufian culture flourished from 12,500 BC to 9500 BC . The Natufians were hunter-gatherers who subsisted on dozens of wild species, but they lived in permanent villages and devoted much of their time to the intensive gathering and processing of wild cereals. They built stone houses and granaries. They stored grain for times of need. They invented new tools such as stone scythes for harvesting wild wheat, and stone pestles and mortars to grind it.

人類燒毀森林與灌木叢時，也幫助了小麥生長。火災清理了樹木和灌木，使小麥和其他草類植物獨占陽光、水和養料。在小麥變得特別豐盛，獵物和其他食物源也豐富的地方，人類部落可以逐漸放棄遊牧生活，在季節性甚至永久性的營地定居下來。起初，他們可能在收穫期間露營四週。一代人之後，隨著小麥植株的增加和擴散，收穫營地可能持續五週、六週，最終成為一個永久性的村莊。這樣的聚落證據已經在整個中東地區發現，尤其是在黎凡特地區，那裡的納圖菲安文化從公元前12,500年到公元前9500年繁盛。納圖菲安人是以狩獵和採集幾十種野生生物種維生，但他們生活在永久性的村莊，並花費大量時間進行野生穀物的密集采集和加工。他們建造了石屋和倉庫。他們為需要時儲存穀物。他們發明了新工具，如採收野生小麥的石鎌，以及磨碎它的石臼和研鉢。

In the years following 9500 BC , the descendants of the Natufians continued to gather and process cereals, but they also began to cultivate them in more and more elaborate ways. When gathering wild grains, they took care to lay aside part of the harvest to sow the fields next season. They discovered that they could achieve much better results by sowing the grains deep in the ground rather than haphazardly scattering them on the surface. So they began to hoe and plough. Gradually they also started to weed the fields, to guard them against parasites, and to water and fertilise them. As more effort was directed towards cereal cultivation, there was less time to gather and hunt wild species. The foragers became farmers.

No single step separated the woman gathering wild wheat from the woman farming domesticated wheat, so it's hard to say exactly when the decisive transition to agriculture took place. But, by 8500 BC , the Middle East was peppered with permanent villages such as Jericho, whose inhabitants spent most of their time cultivating a few domesticated species.

公元前9500年之後，納圖菲人的後代繼續收集和處理穀物，但他們也開始以越來越複雜的方式耕種。採集野生穀物時，他們小心地留下部分收成以便下一季播種。他們發現將穀物深深地埋在土壤中比隨意地在表面灑播能獲得更好的結果。因此他們開始了犁田和耕種。漸漸地，他們也開始除草，防止害蟲，灌溉和施肥。隨著越來越多的精力投入穀物栽培，就沒有太多時間採集和狩獵野生生物種。獵人成為了農夫。從收集野生小麥的女人到種植馴化小麥的女人之間沒有單一的步驟，因此很難確定決定性的農業轉型何時發生。但是，公元前8500年，中東地區點綴著像耶利哥這樣的永久性村莊，居民們絕大部分時間都在種植少數馴化物種。

With the move to permanent villages and the increase in food supply, the population began to grow. Giving up the nomadic lifestyle enabled women to have a child every year. Babies were weaned at an earlier age – they could be fed on porridge and gruel. The extra hands were sorely needed in the fields. But the extra mouths quickly wiped out the food surpluses, so even more fields had to be planted. As people began living in disease-ridden settlements, as children fed more on cereals and less on mother's milk, and as each child competed for his or her porridge with more and more siblings, child mortality soared. In most agricultural societies at least one out of every three children died before reaching twenty. ⁵ Yet the increase in births still outpaced the increase in deaths; humans kept having larger numbers of children.

隨著永久聚落的建立和食品供應的增加，人口開始增長。放棄遊牧生活使得婦女可以每年生育一個孩子。嬰兒可以較早斷奶，可以被餵養稀飯和米粥。田地中需要更多的幫手。但是，更多的嘴巴迅速消耗了食品盈餘，所以更多的田地必須開墾。當人們在充滿疾病的聚落中居住，孩子們越來越少吃母乳，越來越多地吃穀物，而每個孩子都與越來越多的兄弟姐妹競爭稀飯，總體嬰兒死亡率飆升。在大多數農業社

會中，每三個孩子中至少有一個在二十歲之前死亡。然而，出生率仍然超過死亡率，人類繼續生育更多的孩子。

With time, the ‘wheat bargain’ became more and more burdensome. Children died in droves, and adults ate bread by the sweat of their brows. The average person in Jericho of 8500 BC lived a harder life than the average person in Jericho of 9500 BC or 13,000 BC . But nobody realised what was happening. Every generation continued to live like the previous generation, making only small improvements here and there in the way things were done. Paradoxically, a series of ‘improvements’, each of which was meant to make life easier, added up to a millstone around the necks of these farmers.

Why did people make such a fateful miscalculation? For the same reason that people throughout history have miscalculated. People were unable to fathom the full consequences of their decisions. Whenever they decided to do a bit of extra work – say, to hoe the fields instead of scattering seeds on the surface – people thought, ‘Yes, we will have to work harder. But the harvest will be so bountiful! We won’t have to worry any more about lean years. Our children will never go to sleep hungry.’ It made sense. If you worked harder, you would have a better life. That was the plan.

隨著時間的推移，“小麥交易”變得越來越艱難。孩子們大量死亡，成年人吃著流著汗水的麵包。公元前8500年的耶利哥普通人比公元前9500年或公元前13000年的耶利哥普通人過得更加艱苦。但是沒有人意識到正在發生什麼。每一代人繼續像前一代人一樣生活，只在做事情的方法上進行微小的改善。矛盾的是，一系列旨在讓生活變得更輕鬆的“改進”累積到這些農民的頸上成了一個巨大的包袱。為什麼人們會做出如此致命的錯誤？出於歷史上人們經常犯錯的原因。人們無法理解他們的決定的全部後果。每當他們決定多做一些工作時-比如說鋤地而不是在地表上撒種子-人們會想：“是的，我們必須加倍努力工作。但收穫將會非常豐富！我們再也不用擔心荒年。我們的孩子再也不會餓著入睡。”這是有意義的。如果你努力工作，你的生活會變得更好。這就是計劃。

The first part of the plan went smoothly. People indeed worked harder. But people did not foresee that the number of children would increase, meaning that the extra wheat would have to be shared between more children. Neither

did the early farmers understand that feeding children with more porridge and less breast milk would weaken their immune system, and that permanent settlements would be hotbeds for infectious diseases. They did not foresee that by increasing their dependence on a single source of food, they were actually exposing themselves even more to the depredations of drought. Nor did the farmers foresee that in good years their bulging granaries would tempt thieves and enemies, compelling them to start building walls and doing guard duty.

Then why didn't humans abandon farming when the plan backfired? Partly because it took generations for the small changes to accumulate and transform society and, by then, nobody remembered that they had ever lived differently. And partly because population growth burned humanity's boats. If the adoption of ploughing increased a village's population from a hundred to no, which ten people would have volunteered to starve so that the others could go back to the good old times? There was no going back. The trap snapped shut.

計劃的第一部分進展順利。人們確實更加努力地工作。但是人們沒有預見到孩子的數量會增加，這意味著額外的小麥必須在更多孩子之間分享。早期的農民也不明白用更多的粥和較少的母乳來餵養孩子會削弱他們的免疫系統，而且永久定居會成為傳染病的溫床。他們沒有預見到通過增加對單一食物來源的依賴，實際上讓他們更容易受到干旱的破壞。農民也沒有預見到在好年景時，他們的倉庫裝滿了糧食會誘惑小偷和敵人，迫使他們開始建造城牆並進行警戒。那麼為什麼人類沒有在計劃失敗時放棄農業？部分原因是因為需要數代人才能積累小變化，並轉變社會。到那時，沒有人記得他們曾經有過不同的生活方式。另一部分原因是人口增長燃燒了人類的退路。如果耕作的採用使一個村莊的人口從一百增加到一千，有哪十個人會自願餓死以便其他人可以回到美好的時光？沒有回頭路，陷阱關上了。

The pursuit of an easier life resulted in much hardship, and not for the last time. It happens to us today. How many young college graduates have taken demanding jobs in high-powered firms, vowing that they will work hard to earn money that will enable them to retire and pursue their real interests when they are thirty-five? But by the time they reach that age, they have large mortgages, children to school, houses in the suburbs that necessitate at least

two cars per family, and a sense that life is not worth living without really good wine and expensive holidays abroad. What are they supposed to do, go back to digging up roots? No, they double their efforts and keep slaving away.

One of history's few iron laws is that luxuries tend to become necessities and to spawn new obligations. Once people get used to a certain luxury, they take it for granted. Then they begin to count on it. Finally they reach a point where they can't live without it. Let's take another familiar example from our own time. Over the last few decades, we have invented countless time-saving devices that are supposed to make life more relaxed – washing machines, vacuum cleaners, dishwashers, telephones, mobile phones, computers, email. Previously it took a lot of work to write a letter, address and stamp an envelope, and take it to the mailbox. It took days or weeks, maybe even months, to get a reply. Nowadays I can dash off an email, send it halfway around the globe, and (if my addressee is online) receive a reply a minute later. I've saved all that trouble and time, but do I live a more relaxed life?

追求更簡單的生活往往導致很多困難，這並不是第一次發生。這種事今天仍然在發生。有多少年輕的大學畢業生在高效能公司裡擔任難得的工作，發誓要努力賺錢，在35歲時退休並追求他們真正的興趣？但到了那個年齡，他們有巨額的抵押貸款、孩子上學、迫使每個家庭至少要有兩輛車的郊區房屋，以及一種沒有真正好酒和昂貴海外假期生活不值得的感覺。他們該怎麼辦？回去挖根莖？不，他們會加倍努力，繼續拼命工作。歷史上很少有不變的鐵律之一就是奢侈品往往變成必需品並衍生出新的義務。一旦人們習慣了某種奢侈品，他們就會視為理所當然。然後他們開始依賴它。最後他們會達到一個不能沒有它的地步。讓我們來看一個來自我們自己時代的熟悉例子。在過去的幾十年中，我們發明了無數節省時間的設備，旨在使生活更輕鬆-洗衣機，吸塵器，洗碗機，電話，移動電話，計算機，電子郵件。以前，寫一封信需要很多工作，用在信封上貼上郵票，然後把它帶到郵箱裡。收到回覆需要幾天甚至幾個月甚至幾個月的時間。現在，我可以匆匆發送一封郵件，發送到世界各地，如果我的收件人在線上，一分鐘內就能收到回覆。我省了所有那些麻煩和時間，但我生活得更輕鬆嗎？

Sadly not. Back in the snail-mail era, people usually only wrote letters when they had something important to relate. Rather than writing the first thing that came into their heads, they considered carefully what they wanted to say and how to phrase it. They expected to receive a similarly considered answer. Most people wrote and received no more than a handful of letters a month and seldom felt compelled to reply immediately. Today I receive dozens of emails each day, all from people who expect a prompt reply. We thought we were saving time; instead we revved up the treadmill of life to ten times its former speed and made our days more anxious and agitated.

Here and there a Luddite holdout refuses to open an email account, just as thousands of years ago some human bands refused to take up farming and so escaped the luxury trap. But the Agricultural Revolution didn't need every band in a given region to join up. It only took one. Once one band settled down and started tilling, whether in the Middle East or Central America, agriculture was irresistible. Since farming created the conditions for swift demographic growth, farmers could usually overcome foragers by sheer weight of numbers. The foragers could either run away, abandoning their hunting grounds to field and pasture, or take up the ploughshare themselves. Either way, the old life was doomed.

很遺憾不是這樣的。在郵寄信件時代，人們通常只在有重要事情要傳達時才寫信。他們會仔細考慮要說什麼以及如何措辭，而不是隨口寫下第一個想到的話。他們期望得到同樣仔細思考的回應。大多數人每月寫或收到的信件不會超過幾封，並且很少感到必須立即回復。今天，我每天收到數十封來自期望迅速回覆的人的電子郵件。我們認為我們在節省時間，實際上我們加快了生活的步伐，讓我們的日子更加焦慮和不安。偶爾有些技術保守的人拒絕開設電子郵件帳戶，就像幾千年前的一些人類部落拒絕耕作一樣，因此逃避了奢侈的陷阱。但農業革命並不需要在一個特定區域中的每個部落都參與。只要有一個部落定居下來並開始耕作，無論是在中東還是中美洲，農業就是不可抗拒的。由於農耕創造了迅速的人口增長條件，農民通常可以以人數優勢克服狩獵者。狩獵者可以逃跑，把他們的狩獵場讓給田地和牧場，或者自己也開始使用犁具。無論哪種方式，舊生活注定要消失。

The story of the luxury trap carries with it an important lesson. Humanity's search for an easier life released immense forces of change that transformed

the world in ways nobody envisioned or wanted. Nobody plotted the Agricultural Revolution or sought human dependence on cereal cultivation. A series of trivial decisions aimed mostly at filling a few stomachs and gaining a little security had the cumulative effect of forcing ancient foragers to spend their days carrying water buckets under a scorching sun.

Divine Intervention

The above scenario explains the Agricultural Revolution as a miscalculation. It's very plausible. History is full of far more idiotic miscalculations. But there's another possibility. Maybe it wasn't the search for an easier life that brought about the transformation. Maybe Sapiens had other aspirations, and were consciously willing to make their lives harder in order to achieve them.

奢侈陷阱的故事寓含著一個重要的教訓。人類對於更輕鬆的生活的追求釋放了巨大的變革力量，改變了世界，這是沒有人預料或想要的。沒有人策劃過農業革命，也沒有人想要人類依賴於穀物種植。一系列瑣碎的決定，主要是為了填飽一些肚子和獲得一點安全感，卻累積地強迫著古老的狩獵者們在烈日下整天提著水桶奔波。上述情景將農業革命解釋為一個誤算。這是非常有道理的。歷史上充滿了更加愚蠢的錯誤計算。但還有另一種可能性。也許並不是尋求更輕鬆的生活帶來了變革。也許智人有其他的追求，並有意願讓自己的生活變得更艱難以實現這些目標。

Scientists usually seek to attribute historical developments to cold economic and demographic factors. It sits better with their rational and mathematical methods. In the case of modern history, scholars cannot avoid taking into account non-material factors such as ideology and culture. The written evidence forces their hand. We have enough documents, letters and memoirs to prove that World War Two was not caused by food shortages or demographic pressures. But we have no documents from the Natufian culture, so when dealing with ancient periods the materialist school reigns supreme. It is difficult to prove that preliterate people were motivated by faith rather than economic necessity.

Yet, in some rare cases, we are lucky enough to find telltale clues. In 1995 archaeologists began to excavate a site in south-east Turkey called Göbekli

Tepe. In the oldest stratum they discovered no signs of a settlement, houses or daily activities. They did, however, find monumental pillared structures decorated with spectacular engravings. Each stone pillar weighed up to seven tons and reached a height of five metres. In a nearby quarry they found a half-chiselled pillar weighing fifty tons. Altogether, they uncovered more than ten monumental structures, the largest of them nearly thirty metres across.

科學家通常會將歷史發展歸因於冷酷的經濟和人口因素。這符合他們理性和數學方法的特點。對於現代史來說，學者們不能避免考慮意識形態和文化等非物質因素。文字證據迫使他們必須加以考量。我們有足夠的文件、信件和回憶錄來證明二戰不是由於食物短缺或人口壓力引起的。但是，我們沒有來自納圖菲安文化的文件，因此當處理古代時期時，唯物主義學派佔據主導地位。很難證明無識字人民是出於信仰而不是經濟必要性的動機。然而，在一些罕見的情況下，我們足夠幸運地找到了關鍵線索。1995年，考古學家開始在土耳其東南部的哥貝克力特佩遺址進行挖掘。在最古老的地層中，他們沒有發現定居、住房或日常活動的跡象。然而，他們發現了巨大的柱式結構，裝飾著壯觀的雕刻。每個石柱重達七噸，高達五米。在附近的礦場中，他們發現了一根未完成的石柱，重達五十噸。總共發掘出十多個巨大的結構，其中最大的一個近三十米寬。

Archaeologists are familiar with such monumental structures from sites around the world – the best-known example is Stonehenge in Britain. Yet as they studied Göbekli Tepe, they discovered an amazing fact. Stonehenge dates to 2500 BC, and was built by a developed agricultural society. The structures at Göbekli 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.

考古學家對於全球各地發現的這種宏偉建築很熟悉，最著名的例子是英國的巨石陣。然而，當他們研究 Göbekli Tepe 時，他們發現了一個驚人的事實。巨石陣建於公元前 2500 年，是由一個發展完備的農業社

會所建。而 Göbekli Tepe 的結構則可追溯至公元前 9500 年左右，所有可用的證據表明它們是由狩獵採集者所建。考古學界最初發現很難相信這些發現，但一次又一次的測試證實了結構的早期日期和建造者的非農業社會。古代狩獵採集者的能力和其文化的複雜程度似乎遠比先前想像的要印象深刻。



13. Opposite: The remains of a monumental structure from Göbekli 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 Göbekli 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.

13. 對面是來自 Göbekli Tepe 的紀念性建築遺跡。右邊是裝飾石柱之一（約五公尺高）。為什麼狩獵採集社會會建造這樣的建築呢？它們沒有明顯的實用功能。它們既不是長毛象屠殺場，也不是躲避雨水或躲避獅子的場所。這樣就只剩下一個理論，即它們是為某些神秘的文化目的而建造的，考古學家很難解釋。不管是什麼目的，這些狩獵採集者都認為值得付出巨大的努力和時間。建造 Göbekli Tepe 的唯一方式就是讓屬於不同樂團和部落的成千上萬的狩獵採集者在長時間內合作。只有一個複雜的宗教或意識形態體系才能維持這樣的努力。

Göbekli 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 Karaçadag Hills – about thirty kilometres from Göbekli Tepe.⁶



This can hardly be a coincidence. It's likely that the cultural centre of Göbekli 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, they set up a temple in the middle. But Göbekli Tepe suggests that the temple may have been built first, and that a village later grew up around it.

Gobekli Tepe 所隱藏的另一個驚人之處是，在很多年間，基因學家一直在追溯馴化小麥的起源。最近的發現表明，至少有一種馴化變種——小草麥，起源於卡拉查達山——距離 Göbekli Tepe 約 30 公里。這不可能是一個巧合。Göbekli Tepe 的文化中心很可能與人類最初的麥子馴化和麥子對人類的馴化有某種聯繫。為了餵養建造和使用巨大結構的人們，特別需要大量的食物。也許狩獵者從野生麥子的採集轉變為強烈的麥子耕作，並不是為了增加他們正常的食物供應，而是為了支持一座寺廟的建造和運營。在傳統的觀念中，先驅者首先建立一個村莊，當它繁榮時，他們在中心建立一座寺廟。但 Göbekli Tepe 表明，寺廟可能是先建造的，並且後來發展出一個村莊。

Victims of the Revolution

The Faustian bargain between humans and grains was not the only deal our species made. Another deal was struck concerning the fate of animals such as sheep, goats, pigs and chickens. Nomadic bands that stalked wild sheep gradually altered the constitutions of the herds on which they preyed. This process probably began with selective hunting. Humans learned that it was to their advantage to hunt only adult rams and old or sick sheep. They spared fertile females and young lambs in order to safeguard the long-term vitality of the local herd. The second step might have been to actively defend the herd against predators, driving away lions, wolves and rival human bands. The band might next have corralled the herd into a narrow gorge in order to better control and defend it. Finally, people began to make a more careful selection among the sheep in order to tailor them to human needs. The most aggressive

rams, those that showed the greatest resistance to human control, were slaughtered first. So were the skinniest and most inquisitive females. (Shepherds are not fond of sheep whose curiosity takes them far from the herd.) With each passing generation, the sheep became fatter, more submissive and less curious. *Voilà !* Mary had a little lamb and everywhere that Mary went the lamb was sure to go.

人類與穀物之間的浮士德交易並不是我們種族所做的唯一交易。另一項交易涉及羊、山羊、豬和雞等動物的命運。追蹤野羊的游牧部落逐漸改變了他們所獵物群羊的憲法。這個過程可能始於有選擇性的狩獵。人類學會只狩獵成年公羊和老的、生病的羊，這是對他們有利的。他們保留了有生殖能力的母羊和幼羊以保障本地群的長期活力。第二步可能是積極保護群羊避免受到捕食者侵害，驅趕獅子、狼和敵對的人群。為了更好地控制和保護群羊，這些部落可能會將群羊圈入狹窄的峽谷。最終，人們開始更加慎重地選擇羊以滿足人類的需求。最具攻擊性的公羊、對人類控制最強的羊首先被屠宰。同樣地，最瘦和最好奇的母羊也會被屠宰。（牧羊人不喜歡好奇心帶它們遠離群羊的羊。）隨著每一代的過去，羊變肥了、更加服從、不那麼好奇。Mary有一只小羊羔，不論Mary走到哪里，小羊羔都跟隨在她的身旁。

Alternatively, hunters may have caught and adopted' a lamb, fattening it during the months of plenty and slaughtering it in the leaner season. At some stage they began keeping a greater number of such lambs. Some of these reached puberty and began to procreate. The most aggressive and unruly lambs were first to the slaughter. The most submissive, most appealing lambs were allowed to live longer and procreate. The result was a herd of domesticated and submissive sheep.

Such domesticated animals – sheep, chickens, donkeys and others – supplied food (meat, milk, eggs), raw materials (skins, wool), and muscle power. Transportation, ploughing, grinding and other tasks, hitherto performed by human sinew, were increasingly carried out by animals. In most farming societies people focused on plant cultivation; raising animals was a secondary activity. But a new kind of society also appeared in some places, based primarily on the exploitation of animals: tribes of pastoralist herders.

獵人亦會捕捉並收養羊羔，在豐裕的季節養肥它們，然後在缺乏食物的季節屠宰。最初，他們就這麼養了一些羊羔。這些羊羔有些長大後便會開始繁殖。最具攻擊性和難以控制的羊羔率先被屠宰，而最服從、最具魅力的羊羔則被允許活得更久並繁殖後代。其結果是得到了一群馴養且服從的綿羊。這樣的家畜——綿羊、雞、驢和其他動物——提供食物（肉、牛奶、蛋）、原材料（皮革、羊毛）和動力。以前由人體力完成的運輸、耕作、磨碎等工作，逐漸由動物完成。在大多數耕作社會中，人們的重點是植物栽培，飼養動物只是次要活動。但在一些地方，也出現了一種基於動物利用的新型社會：游牧牧民部落。

As humans spread around the world, so did their domesticated animals. Ten thousand years ago, not more than a few million sheep, cattle, goats, boars and chickens lived in restricted Afro-Asian niches. Today the world contains about a billion sheep, a billion pigs, more than a billion cattle, and more than 25 billion chickens. And they are all over the globe. The domesticated chicken is the most widespread fowl ever. Following *Homo sapiens*, domesticated cattle, pigs and sheep are the second, third and fourth most widespread large mammals in the world. From a narrow evolutionary perspective, which measures success by the number of DNA copies, the Agricultural Revolution was a wonderful boon for chickens, cattle, pigs and sheep.

Unfortunately, the evolutionary perspective is an incomplete measure of success. It judges everything by the criteria of survival and reproduction, with no regard for individual suffering and happiness. Domesticated chickens and cattle may well be an evolutionary success story, but they are also among the most miserable creatures that ever lived. The domestication of animals was founded on a series of brutal practices that only became crueler with the passing of the centuries.

隨著人類在世界各地的傳播，他們的家禽寵物也跟著而來。一萬年前，在非洲和亞洲地區僅有數百萬隻羊、牛、山羊、野豬和雞在有限的生活空間內。如今，全球大約有十億隻羊、十億隻豬、超過十億頭牛，和超過二十五億隻雞。它們遍布全球，其中家禽雞是最廣泛分布的物種，而家牛、家豬、家羊則是繼人類後，世界上傳播範圍第二、第三和第四大哺乳動物。從狹窄的演化角度看，衡量成功的機標準是DNA的複製數量，農業革命對雞、牛、豬和羊來說是巨大的助

益。不幸的是，演化的角度是一種不完整的成功衡量標準，它僅按照生存和繁殖的標準評估一切，不考慮個體的痛苦和幸福。家禽雞和家牛可能是演化成功故事的代表，但它們也是有史以來最痛苦的生物之一。家畜養殖史始建立於一系列殘忍的做法，並隨著歲月的推移變得更加殘忍。

The natural lifespan of wild chickens is about seven to twelve years, and of cattle about twenty to twenty-five years. In the wild, most chickens and cattle died long before that, but they still had a fair chance of living for a respectable number of years. In contrast, the vast majority of domesticated chickens and cattle are slaughtered at the age of between a few weeks and a few months, because this has always been the optimal slaughtering age from an economic perspective. (Why keep feeding a cock for three years if it has already reached its maximum weight after three months?)

Egg-laying hens, dairy cows and draught animals are sometimes allowed to live for many years. But the price is subjugation to a way of life completely alien to their urges and desires. It's reasonable to assume, for example, that bulls prefer to spend their days wandering over open prairies in the company of other bulls and cows rather than pulling carts and ploughshares under the yoke of a whip-wielding ape.

野雞的自然壽命大約是七到十二年，而牛則約為二十到二十五年。在野外，大多數雞和牛都比這更短命，但它們仍有機會活上幾十年。相比之下，絕大多數的家禽和家牛在幾個星期到幾個月的年齡時就被屠宰了，因為從經濟角度來看這一直是最優屠宰年齡。（如果一隻公雞已經在三個月後達到最大體重，為什麼還要養三年？）產蛋雞、乳牛和畜力牲畜有時可以活多年。但代價是完全迎合它們的慾望和衝動所不同的一種生活方式。例如，可以合理地假設，公牛更喜歡在和其他公牛和母牛一起在廣闊的草原上漫遊，而不是在一個鞭打的猿人的掌控下拉著車和犁。

In order to turn bulls, horses, donkeys and camels into obedient draught animals, their natural instincts and social ties had to be broken, their aggression and sexuality contained, and their freedom of movement curtailed. Farmers developed techniques such as locking animals inside pens and cages, bridling them in harnesses and leashes, training them with whips and

cattle prods, and mutilating them. The process of taming almost always involves the castration of males. This restrains male aggression and enables humans selectively to control the herd's procreation.



14. A painting from an Egyptian grave, c.1200 BC : A pair of oxen ploughing a field. In the wild, cattle roamed as they pleased in herds with a complex social structure. The castrated and domesticated ox wasted away his life under the lash and in a narrow pen, labouring alone or in pairs in a way that suited neither its body nor its social and emotional needs. When an ox could no longer pull the plough, it was slaughtered. (Note the hunched position of the Egyptian farmer who, much like the ox, spent his life in hard labour oppressive to his body, his mind and his social relationships.)

為了將公牛、馬匹、驢子和駱駝變成聽命的耕獸，農民們需要打破它們的自然本能和社交聯繫，控制它們的攻擊性和性行為，限制它們的行動自由。他們發展出了鎖在圈舍和籠子中的技術，用馬具和皮帶韁繩控制它們，用鞭子和輕度電擊器訓練它們，甚至還要對牠們進行切除手術。馴服過程中幾乎總是需要進行去勢手術。這可以限制公牛的攻擊性，並使人類有選擇性地控制牛群的繁殖。14.一幅公元前1200年的埃及墓穴中的畫：一對牛正在犁地。在野外，牛群按照複雜的社會

結構隨意漫步。被閹割和馴養的牛將其生命浪費在狹窄的圈舍中受鞭打，單獨或成對地勞作，這種方式既不符合其體型，也不符合其社會和情感需求。當牛不再能夠拉犁時，就被屠宰。（值得注意的是，埃及農民的弓著的姿勢與牛非常相似，他的一生都在艱苦的勞動中度過，這對他的身體、思想和社交關係都是壓迫性的。）

In many New Guinean societies, the wealth of a person has traditionally been determined by the number of pigs he or she owns. To ensure that the pigs can't run away, farmers in northern New Guinea slice off a chunk of each pig's nose. This causes severe pain whenever the pig tries to sniff. Since the pigs cannot find food or even find their way around without sniffing, this mutilation makes them completely dependent on their human owners. In another area of New Guinea, it has been customary to gouge out pigs' eyes, so that they cannot even see where they're going.⁷

The dairy industry has its own ways of forcing animals to do its will. Cows, goats and sheep produce milk only after giving birth to calves, kids and lambs, and only as long as the youngsters are suckling. To continue a supply of animal milk, a farmer needs to have calves, kids or lambs for suckling, but must prevent them from monopolising the milk. One common method throughout history was to simply slaughter the calves and kids shortly after birth, milk the mother for all she was worth, and then get her pregnant again. This is still a very widespread technique. In many modern dairy farms a milk cow usually lives for about five years before being slaughtered. During these five years she is almost constantly pregnant, and is fertilised within 60 to 120 days after giving birth in order to preserve maximum milk production. Her calves are separated from her shortly after birth. The females are reared to become the next generation of dairy cows, whereas the males are handed over to the care of the meat industry.⁸

在許多新幾內亞社會中，一個人的財富傳統上是由他或她所擁有的豬的數量來決定的。為了確保豬不能逃跑，新幾內亞北部的農民會切下每隻豬鼻子的一塊。這會在豬嘗試嗅探時引起嚴重的疼痛。由於豬無法找到食物甚至無法找到路，這種毀容使它們完全依賴於它們的人類主人。在新幾內亞的另一個地區，一直以來有慣例將豬的眼睛挖出，以便它們甚至看不到自己的去向。乳業有自己的方式來迫使動物屈服。牛、山羊和綿羊只有在生產小牛、小羊和小羔之後，並且只有在

幼獸在吸乳時才能產奶。為了維持動物乳品的供應，農民需要有小牛、小羊或小羔吸乳，但必須防止它們壟斷乳汁。通過歷史，一種常見的方法是在出生後不久就將小牛和小羊宰殺，大力擠乳，然後再次讓它懷孕。這仍然是一種非常普遍的技術。在許多現代的乳製品農場中，乳牛通常活了五年左右就會被宰殺。在這五年中，它幾乎總是懷孕，並在分娩後60到120天內受孕，以保持最大的乳製品生產。幼崽在出生後不久就與母親分開。雌性幼崽被繁殖成下一代乳牛，而雄性幼崽則交給肉類行業照顧。

Another method is to keep the calves and kids near their mothers, but prevent them by various stratagems from suckling too much milk. The simplest way to do that is to allow the kid or calf to start suckling, but drive it away once the milk starts flowing. This method usually encounters resistance from both kid and mother. Some shepherd tribes used to kill the offspring, eat its flesh, and then stuff the skin. The stuffed offspring was then presented to the mother so that its presence would encourage her milk production. The Nuer tribe in the Sudan went so far as to smear stuffed animals with their mother's urine, to give the counterfeit calves a familiar, live scent. Another Nuer technique was to tie a ring of thorns around a calf's mouth, so that it pricks the mother and causes her to resist suckling.⁹ Tuareg camel breeders in the Sahara used to puncture or cut off parts of the nose and upper lip of young camels in order to make suckling painful, thereby discouraging them from consuming too much milk.¹⁰

另一種方法是讓小牛和小山羊靠近母親，但通過各種策略防止它們吮吸過多的乳汁。最簡單的方法是允許小羊或小牛開始吮吸，但一旦乳汁開始流動，就驅逐它們。這種方法通常會遇到小羊和母羊的反抗。有些牧羊民族曾經殺死幼崽，吃掉它的肉，然後把皮毛填充。然後將填充的幼崽呈現給母親，以便其存在能夠鼓勵她的乳製品生產。在蘇丹的努爾部落，有些人甚至把填充的動物塗上母親的尿液，以賦予假冒的小牛熟悉、現場的氣味。努爾部落的另一種技術是在小牛的嘴上綁一圈荊棘，以刺激母牛抵抗吮吸。撒哈拉沙漠的圖阿雷格駱駝養殖者曾經割掉或切掉年幼駱駝的鼻子和上唇的部分，以使吮吸變得疼痛，因此阻止它們消耗過多的乳汁。

Not all agricultural societies were this cruel to their farm animals. The lives of some domesticated animals could be quite good. Sheep raised for wool, pet dogs and cats, war horses and race horses often enjoyed comfortable conditions. The Roman emperor Caligula allegedly planned to appoint his favourite horse, Incitatus, to the consulship. Shepherds and farmers throughout history showed affection for their animals and have taken great care of them, just as many slaveholders felt affection and concern for their slaves. It was no accident that kings and prophets styled themselves as shepherds and likened the way they and the gods cared for their people to a shepherd's care for his flock.



15. A modern calf in an industrial meat farm. Immediately after birth the calf is separated from its mother and locked inside a tiny cage not much bigger than the calf's own body. There the calf spends its entire life – about four months on average. It never leaves its cage, nor is it allowed to play with other calves or even walk – all so that its muscles will not grow strong. Soft muscles mean a soft and juicy steak. The first time the calf has a chance to walk, stretch its muscles and touch other calves is on its way to the slaughterhouse. In evolutionary terms, cattle represent

one of the most successful animal species ever to exist. At the same time, they are some of the most miserable animals on the planet .

不是所有农业社会都这么残忍对待农场动物。一些驯养动物的生活可能非常好。养羊為了毛，宠物狗和猫，战马和赛马通常享有舒适的条件。罗马皇帝卡利古拉据称计划任命他最喜爱的马，英赛塔图斯，为执政官。历史上，牧羊人和农民对他们的动物表示了感情，并精心照顾它们，就像许多奴隶主一样对他们的奴隶表示感情和关注。国王和先知们自称为牧羊人，并将他们和神如何关心他们的人民与牧羊人关心他的羊群的方式相提并论，这不是偶然的。 15. 工业肉牛场的现代小牛。出生后，小牛立即与母亲分开，并被锁在一个比小牛自己的身体还小得多的小笼子里。小牛在那里度过了它的整个生命-平均约四个月。它从未离开过它的笼子，也不允许与其他小牛玩耍甚至步行-所有这些都是为了使其肌肉不变得强壮。柔软的肌肉意味着柔软和多汁的牛排。小牛有机会走路，伸展肌肉和与其他小牛接触的第一次是在去屠宰场的路上。在进化上，牛代表了有史以来最成功的动物物种之一。同时，它们也是地球上最不幸的动物之一。

Yet from the viewpoint of the herd, rather than that of the shepherd, it's hard to avoid the impression that for the vast majority of domesticated animals, the Agricultural Revolution was a terrible catastrophe. Their evolutionary 'success' is meaningless. A rare wild rhinoceros on the brink of extinction is probably more satisfied than a calf who spends its short life inside a tiny box, fattened to produce juicy steaks. The contented rhinoceros is no less content for being among the last of its kind. The numerical success of the calf's species is little consolation for the suffering the individual endures.

This discrepancy between evolutionary success and individual suffering is perhaps the most important lesson we can draw from the Agricultural Revolution. When we study the narrative of plants such as wheat and maize, maybe the purely evolutionary perspective makes sense. Yet in the case of animals such as cattle, sheep and Sapiens, each with a complex world of sensations and emotions, we have to consider how evolutionary success translates into individual experience. In the following chapters we will see time and again how a dramatic increase in the collective power and ostensible success of our species went hand in hand with much individual suffering.

從牛群而非牧羊人的觀點來看，大部分被馴養的動物來說，農業革命是一場可怕的災難，牠們的進化"成功"毫無意義。一隻瀕臨絕種的野生犀牛可能比一隻被關在小盒子裡，被餵肥以生產多汁牛排的小牛更滿足。即使是那隻滿足的犀牛是種中最後的一隻，它也不會少感到滿足。小牛所屬物種的數量上的成功對於個體所遭受的痛苦而言，意義微乎其微。這種進化成功與個體苦難之間的差異，或許可以從農業革命中吸取最重要的教訓。當我們研究小麥、玉米等植物的故事時，可能僅僅從進化的角度來看是有道理的。但對於牛、羊、智人等動物，每個都有著複雜的感覺與情感，我們必須考慮進化成功如何轉化為個體體驗。在接下來的章節中，我們將一再看到，我們物種的集體能力和表面上的成功增加，伴隨著許多個體的苦難。

6

Building Pyramids

THE AGRICULTURAL REVOLUTION IS ONE of the most controversial events in history. Some partisans proclaim that it set humankind on the road to prosperity and progress. Others insist that it led to perdition. This was the turning point, they say, where *Sapiens* cast off its intimate symbiosis with nature and sprinted towards greed and alienation. Whichever direction the road led, there was no going back. Farming enabled populations to increase so radically and rapidly that no complex agricultural society could ever again sustain itself if it returned to hunting and gathering. Around 10,000 BC, before the transition to agriculture, earth was home to about 5–8 million nomadic foragers. By the first century AD, only 1–2 million foragers remained (mainly in Australia, America and Africa), but their numbers were dwarfed by the world's 250 million farmers.¹

農業革命是歷史上最具爭議的事件之一。其中一些人宣稱它使人類踏上了繁榮與進步的道路。其他人則堅持認為這導致了災難。他們認為這是轉折點，智人放棄了與大自然的密切共生，為貪婪和疏離奔跑。不論路徑通向哪個方向，都無法回頭。耕作使人口驚人地快速增加，如果回到狩獵和採集，沒有任何複雜的農業社會可以再維持下去。大約在公元前10000年轉向農業之前，地球上約有500萬至800萬遊牧的狩獵者。到公元一世紀，只有1至2百萬狩獵者（主要分布在澳大利亞、美洲和非洲），但他們的數量被世界上2.5億農民所超越。1

The vast majority of farmers lived in permanent settlements; only a few were nomadic shepherds. Settling down caused most peoples turf to shrink dramatically. Ancient hunter-gatherers usually lived in territories covering many dozens and even hundreds of square kilometres. ‘Home’ was the entire territory, with its hills, streams, woods and open sky. Peasants, on the other hand, spent most of their days working a small field or orchard, and their domestic lives centred on a cramped structure of wood, stone or mud,

measuring no more than a few dozen metres – the house. The typical peasant developed a very strong attachment to this structure. This was a far-reaching revolution, whose impact was psychological as much as architectural. Henceforth, attachment to ‘my house’ and separation from the neighbours became the psychological hallmark of a much more self-centred creature.

絕大多數的農民都住在永久性的定居處，只有少數是遊牧的牧羊人。定居導致大多數人的領土劇烈縮小。古代的狩獵採集者通常居住在面積達數十甚至數百平方公里的領土內。「家」就是整個領土，包括它的山丘、溪流、樹林和開闊的天空。相反地，農民大部分時間都在耕種小型田地或果園，他們的家庭生活圍繞著一個僅幾十米大小，由木材、石頭或泥巴組成的狹窄房屋。典型的農民對這個結構產生了非常強烈的依戀。這是一場深遠的革命，其影響不僅限於建築，還有心理學方面。從此，對「我家」的依戀和與鄰居的分開成為更為以自我為中心的人的心理標誌。

The new agricultural territories were not only far smaller than those of ancient foragers, but also far more artificial. Aside from the use of fire, hunter-gatherers made few deliberate changes to the lands in which they roamed. Farmers, on the other hand, lived in artificial human islands that they laboriously carved out of the surrounding wilds. They cut down forests, dug canals, cleared fields, built houses, ploughed furrows, and planted fruit trees in tidy rows. The resulting artificial habitat was meant only for humans and ‘their’ plants and animals, and was often fenced off by walls and hedges. Farmer families did all they could to keep out wayward weeds and wild animals. If such interlopers made their way in, they were driven out. If they persisted, their human antagonists sought ways to exterminate them. Particularly strong defences were erected around the home. From the dawn of agriculture until this very day, billions of humans armed with branches, swatters, shoes and poison sprays have waged relentless war against the diligent ants, furtive roaches, adventurous spiders and misguided beetles that constantly infiltrate the human domicile.

新的農業領地不僅比古代狩獵者的領地要小得多，而且也更加人為。除了使用火外，狩獵採集者對他們漫遊的土地幾乎沒有刻意做出任何改變。相反地，農民生活在人工島上，他們辛苦地從周圍的荒野中開闢而來。他們砍伐森林，挖掘渠道，清理田野，建造房屋，耕地，

並在整齊的地段種植果樹。其結果形成的人工棲息地專門供人和“他們”的植物和動物使用，通常被圍牆和樹籬圍起來。農民家庭竭盡所能防止野草和野生動物入侵。如果這些入侵者進入，它們就會被驅逐出去。如果它們堅持不懈，它們的人類對手會尋求消滅它們的方法。特別是在家中周圍建立了堅固的防禦措施。從農業的開始到今天，數十億武裝著樹枝、拍蠅拍、鞋子和殺蟲噴霧器的人類對不斷滲入人類居所的勤勉螞蟻、躲躲藏藏的蟑螂、冒險的蜘蛛和迷路的甲蟲進行了毫不善鬥的戰爭。

For most of history these man-made enclaves remained very small, surrounded by expanses of untamed nature. The earth's surface measures about 510 million square kilometres, of which 155 million is land. As late as AD 1400, the vast majority of farmers, along with their plants and animals, clustered together in an area of just 11 million square kilometres – 2 per cent of the planet's surface.² Everywhere else was too cold, too hot, too dry, too wet, or otherwise unsuited for cultivation. This minuscule 2 per cent of the earth's surface constituted the stage on which history unfolded.

People found it difficult to leave their artificial islands. They could not abandon their houses, fields and granaries without grave risk of loss. Furthermore, as time went on they accumulated more and more things – objects, not easily transportable, that tied them down. Ancient farmers might seem to us dirt poor, but a typical family possessed more artefacts than an entire forager tribe.

大部分的歷史上，這些人造的孤島一直相當小，被茂密的自然景觀所包圍。地球表面約有5.1億平方公里，其中1.55億平方公里為陸地。直到公元1400年，大多數農民連同其植物和動物聚集在僅佔地球表面2%的區域—1100萬平方公里內。其他地方要麼太冷、太熱、太乾、太濕，或者不適合耕作。這極小的2%地球表面，是歷史發展的舞台。人們發現離開他們的人造島嶼很困難。他們不能放棄他們的房屋、田地和倉庫，否則會面臨巨大的風險。此外，隨著時間推移，他們積累了越來越多的東西-不易運輸的物品把他們綁死。古代農民對我們來說可能看起來很貧窮，但一個典型的家庭擁有的文物比整個狩獵族群更多。

The Coming of the Future

While agricultural space shrank, agricultural time expanded. Foragers usually didn't waste much time thinking about next week or next month. Farmers sailed in their imagination years and decades into the future.

Foragers discounted the future because they lived from hand to mouth and could only preserve food or accumulate possessions with difficulty. Of course, they clearly engaged in some advanced planning. The creators of the cave paintings of Chauvet, Lascaux and Altamira almost certainly intended them to last for generations. Social alliances and political rivalries were long-term affairs. It often took years to repay a favour or to avenge a wrong. Nevertheless, in the subsistence economy of hunting and gathering, there was an obvious limit to such long-term planning. Paradoxically, it saved foragers a lot of anxieties. There was no sense in worrying about things that they could not influence.

雖然農業空間縮小了，但農業時間卻延長了。採集者通常不會浪費太多時間思考下周或下個月的事情。農民們的想像能力可以飄渺到未來的數十年。採集者忽視了未來，因為他們必須以口糧維生，只能費盡周折地保存食物或積累財物。當然，他們也進行了一些高級計劃。如肖維洞、拉斯考洞和阿尔塔米拉洞穴壁畫的創作者肯定是希望它們持久流傳。社會聯盟和政治爭鬥是長期的任務。返還恩惠或為不義之人復仇常常需要數年時間。然而，在狩獵和採集的溫飽經濟中，這種長期計劃也有明顯的局限性。矛盾的是，這使得採集者減少了很多焦慮。他們無意去擔憂他們無法控制的事情。

The Agricultural Revolution made the future far more important than it had ever been before. Farmers must always keep the future in mind and must work in its service. The agricultural economy was based on a seasonal cycle of production, comprising long months of cultivation followed by short peak periods of harvest. On the night following the end of a plentiful harvest the peasants might celebrate for all they were worth, but within a week or so they were again up at dawn for a long day in the field. Although there was enough food for today, next week, and even next month, they had to worry about next year and the year after that.

Concern about the future was rooted not only in seasonal cycles of production, but also in the fundamental uncertainty of agriculture. Since most villages lived by cultivating a very limited variety of domesticated plants and animals, they were at the mercy of droughts, floods and pestilence. Peasants were obliged to produce more than they consumed so that they could build up reserves. Without grain in the silo, jars of olive oil in the cellar, cheese in the pantry and sausages hanging from the rafters, they would starve in bad years. And bad years were bound to come, sooner or later. A peasant living on the assumption that bad years would not come didn't live long.

農業革命使未來變得比以往任何時候都更重要。農民必須時刻牢記未來並為其服務。農業經濟基於季節性生產循環，包括長期的耕作月份，跟隨短暫的收成高峰期。在豐收結束的夜晚，農民可能會慶祝所有的東西，但在一周左右的時間裡，他們又在黎明時分開始一天漫長的勞作。雖然現在有足夠的食物、下周、甚至下個月的，但他們必須擔心明年和後年的情況。對未來的擔憂不僅源於季節性生產的循環，也源於農業的根本不確定性。由於大多數村莊靠種植極為有限的家畜和植物為生，他們受到干旱、水災和疾病的摧殘。農民必須生產出多於他們所消耗的，以便他們能夠積累儲備。沒有穀物存儲在倉庫裡、橄欖油裝在地窖裡、奶酪放在食品櫥櫃裡或香腸掛在樓梯上，他們在不好的年份會忍饑挨餓。而不好的年份遲早會來臨。一個農民如果相信不會有不好的年份，他就活不長。

Consequently, from the very advent of agriculture, worries about the future became major players in the theatre of the human mind. Where farmers depended on rains to water their fields, the onset of the rainy season meant that each morning the farmers gazed towards the horizon, sniffing the wind and straining their eyes. Is that a cloud? Would the rains come on time? Would there be enough? Would violent storms wash the seeds from the fields and batter down seedlings? Meanwhile, in the valleys of the Euphrates, Indus and Yellow rivers, other peasants monitored, with no less trepidation, the height of the water. They needed the rivers to rise in order to spread the fertile topsoil washed down from the highlands, and to enable their vast irrigation systems to fill with water. But floods that surged too high or came at the wrong time could destroy their fields as much as a drought.

因此，从农业出现的那一刻起，对未来的担忧成为了人类思想剧场中的主要角色。农民们需要雨水来灌溉他们的田地，雨季的到来意味着每天早上，农民们都会注视着天边，嗅着风，竭尽全力地看清。那是云彩吗？雨会准时到来吗？会有足够的雨水吗？暴风雨会把种子从田地上冲走吗？与此同时，在幼发拉底，印度和黄河的山谷中，其他农民也同样担心着水位的高低。他们需要河水上涨，以便让高地冲下来的肥沃表土扩散开来，并让他们令人惊叹的灌溉系统充满水。但水位过高或涌来的时间不对的洪水可能会像干旱一样摧毁他们的田地。

Peasants were worried about the future not just because they had more cause for worry, but also because they could do something about it. They could clear another field, dig another irrigation canal, sow more crops. The anxious peasant was as frenetic and hardworking as a harvester ant in the summer, sweating to plant olive trees whose oil would be pressed by his children and grandchildren, putting off until the winter or the following year the eating of the food he craved today.

The stress of farming had far-reaching consequences. It was the foundation of large-scale political and social systems. Sadly, the diligent peasants almost never achieved the future economic security they so craved through their hard work in the present. Everywhere, rulers and elites sprang up, living off the peasants' surplus food and leaving them with only a bare subsistence.

農民擔心未來，不僅因為他們更有理由擔心，而且因為他們可以有所作為。他們可以開墾另一塊土地，挖掘另一條灌溉渠道，播種更多的作物。焦慮的農民與夏日中的割草蟻一樣忙碌，為種植橄欖樹而汗流浹背，其油會由他的子孫壓榨，他想今天吃的食則一直拖延到冬天或明年去享用。農耕的壓力產生了深遠的影響，它是大型政治和社會系統的基礎。可悲的是，勤奮的農民幾乎從未通過他們當下的辛勤工作實現未來的經濟安全。到處都是統治者和精英階層，他們以農民的過剩食物為生，使農民只得勉強維持基本生計。

These forfeited food surpluses fuelled politics, wars, art and philosophy. They built palaces, forts, monuments and temples. Until the late modern era, more than 90 per cent of humans were peasants who rose each morning to till the land by the sweat of their brows. The extra they produced fed the tiny minority of elites – kings, government officials, soldiers, priests, artists and

thinkers – who fill the history books. History is something that very few people have been doing while everyone else was ploughing fields and carrying water buckets.

An Imagined Order

The food surpluses produced by peasants, coupled with new transportation technology, eventually enabled more and more people to cram together first into large villages, then into towns, and finally into cities, all of them joined together by new kingdoms and commercial networks.

這些被沒收的食品盈餘推動了政治、戰爭、藝術和哲學的發展。它們建造了宮殿、堡壘、紀念碑和寺廟。直到現代後期，超過90%的人類都是農民，每天早晨起床到田間辛勤勞作。他們多餘的產量養活了少數精英：國王、政府官員、士兵、祭司、藝術家和思想家，他們的名字在歷史書籍中被記載下來。歷史是很少一部分人在做著什麼，而其他所有人都在農田中耕耘和運水桶。農民生產的盈餘食品，加上新的交通技術，最終讓越來越多的人擠在大型村莊中，然後是鎮和城市，所有這些地方都因新王國和商業網絡而聯繫在一起。

Yet in order to take advantage of these new opportunities, food surpluses and improved transportation were not enough. The mere fact that one can feed a thousand people in the same town or a million people in the same kingdom does not guarantee that they can agree how to divide the land and water, how to settle disputes and conflicts, and how to act in times of drought or war. And if no agreement can be reached, strife spreads, even if the storehouses are bulging. It was not food shortages that caused most of history's wars and revolutions. The French Revolution was spearheaded by affluent lawyers, not by famished peasants. The Roman Republic reached the height of its power in the first century BC, when treasure fleets from throughout the Mediterranean enriched the Romans beyond their ancestors' wildest dreams. Yet it was at that moment of maximum affluence that the Roman political order collapsed into a series of deadly civil wars. Yugoslavia in 1991 had more than enough resources to feed all its inhabitants, and still disintegrated into a terrible bloodbath.

然而，為了利用這些新機會，食物盈餘和改善的運輸不足夠。僅僅因為可以在同一個城鎮中養活一千人或在同一個王國中養活一百萬人，並不保證他們能夠就如何分配土地和水資源、如何解決爭端和衝突、以及如何在乾旱或戰爭時採取行動達成一致。如果沒有達成協議，衝突就會擴散，即使倉庫裡擠滿了食物也一樣。歷史上引發大多數戰爭和革命的不是糧食短缺。法國大革命是由富有的律師主導，而不是靠饑餓的農民發動的。羅馬共和國在公元前一世紀到達其最高峰，當時來自地中海各地的寶藏船隊豐富了羅馬人超過他們祖先的夢想。然而，在這最豐裕的時候，羅馬政治秩序卻陷入了一系列致命的內戰。1991年的南斯拉夫有足夠的資源來養活所有的居民，但仍然分裂成一場可怕的流血事件。

The problem at the root of such calamities is that humans evolved for millions of years in small bands of a few dozen individuals. The handful of millennia separating the Agricultural Revolution from the appearance of cities, kingdoms and empires was not enough time to allow an instinct for mass cooperation to evolve.

Despite the lack of such biological instincts, during the foraging era, hundreds of strangers were able to cooperate thanks to their shared myths. However, this cooperation was loose and limited. Every Sapiens band continued to run its life independently and to provide for most of its own needs. An archaic sociologist living 20,000 years ago, who had no knowledge of events following the Agricultural Revolution, might well have concluded that mythology had a fairly limited scope. Stories about ancestral spirits and tribal totems were strong enough to enable 500 people to trade seashells, celebrate the odd festival, and join forces to wipe out a Neanderthal band, but no more than that. Mythology, the ancient sociologist would have thought, could not possibly enable millions of strangers to cooperate on a daily basis.

這種災難的根源問題在於，人類在數百萬年來演化成數十人組成的小團體。農業革命和城市、王國和帝國的出現之間只有幾千年的時間，這段時間不足以讓大規模協作的本能演化出來。儘管缺乏這種生物本能，在採集時期，數百個陌生人仍然能夠通過共同的神話進行合作。然而，這種合作是鬆散和有限的。每個智人團隊都繼續獨立運作，為大部分自身需求提供支持。一位生活在2萬年前、對農業革命之後的事

件一無所知的古老社會學家可能會得出這樣的結論：神話的範圍相當有限。有關祖先精靈和部落圖騰的故事足以使500人交換海貝殼、慶祝特殊節日，並聯合力量消滅尼安德特人部落，但不會更多。這位古老的社會學家會想，神話不可能使數百萬的陌生人每天都能夠合作。

But that turned out to be wrong. Myths, it transpired, *are* stronger than anyone could have imagined. When the Agricultural Revolution opened opportunities for the creation of crowded cities and mighty empires, people invented stories about great gods, motherlands and joint stock companies to provide the needed social links. While human evolution was crawling at its usual snail's pace, the human imagination was building astounding networks of mass cooperation, unlike any other ever seen on earth.

Around 8500 BC the largest settlements in the world were villages such as Jericho, which contained a few hundred individuals. By 7000 BC the town of Çatalhöyük in Anatolia numbered between 5,000 and 10,000 individuals. It may well have been the world's biggest settlement at the time. During the fifth and fourth millennia BC , cities with tens of thousands of inhabitants sprouted in the Fertile Crescent, and each of these held sway over many nearby villages. In 3100 BC the entire lower Nile Valley was united into the first Egyptian kingdom. Its pharaohs ruled thousands of square kilometres and hundreds of thousands of people. Around 2250 BC Sargon the Great forged the first empire, the Akkadian. It boasted over a million subjects and a standing army of 5,400 soldiers. Between 1000 BC and 500 BC , the first mega-empires appeared in the Middle East: the Late Assyrian Empire, the Babylonian Empire, and the Persian Empire. They ruled over many millions of subjects and commanded tens of thousands of soldiers.

但這結果被證明是錯誤的。神話比任何人想像的都更強大。當農業革命開啟了創造擁擠城市和強大帝國的機會時，人們創造了有關偉大神祇、祖國和股份公司的故事，以提供所需的社會聯繫。當人類進化以其緩慢的速度爬行時，人類的想像力正在建立驚人的大量協作網絡，這是地球上任何其他網絡都不會見過的。公元前8500年，世界上最大的聚落是包含幾百人的村莊，例如耶利哥。到公元前7000年，位於安那托利亞的恰特拉赫克城市人口為5,000至10,000人。當時它很可能是世界上最大的定居點。在公元前五千年到四千年間，人口有幾萬的城市在肥沃的新月地帶拔地而起，每個城市統治著許多附近的村莊。公

公元前3100年，整個下埃及河谷被統一為第一個埃及王國。它的法老統治著數千平方公里和數十萬人。約公元前2250年，大帝國之父薩爾貢建立了第一個帝國——阿卡德帝國。它擁有超過一百萬個臣民和一支由5,400名士兵組成的常備軍隊。在公元前1000年到公元前500年間，中東出現了第一批超級帝國：晚期亞述帝國、巴比倫帝國和波斯帝國。他們統治著數百萬臣民，指揮著數萬名士兵。

In 221 BC the Qin dynasty united China, and shortly afterwards Rome united the Mediterranean basin. Taxes levied on 40 million Qin subjects paid for a standing army of hundreds of thousands of soldiers and a complex bureaucracy that employed more than 100,000 officials. The Roman Empire at its zenith collected taxes from up to 100 million subjects. This revenue financed a standing army of 250,000–500,000 soldiers, a road network still in use 1,500 years later, and theatres and amphitheatres that host spectacles to this day.



16. A stone stela inscribed with the Code of Hammurabi , c .1776 BC .

Impressive, no doubt, but we mustn't harbour rosy illusions about 'mass cooperation networks' operating in pharaonic Egypt or the Roman Empire. 'Cooperation' sounds very altruistic, but is not always voluntary and seldom egalitarian. Most human cooperation networks have been geared towards oppression and exploitation. The peasants paid for the burgeoning cooperation networks with their precious food surpluses, despairing when the tax collector wiped out an entire year of hard labour with a single stroke of his imperial pen. The famed Roman amphitheatres were often built by slaves so that wealthy and idle Romans could watch other slaves engage in vicious gladiatorial combat. Even prisons and concentration camps are

cooperation networks, and can function only because thousands of strangers somehow manage to coordinate their actions.

公元前221年，秦朝統一了中國，不久之後，羅馬統一了地中海盆地。對四千萬秦民徵稅資助了數十萬士兵的常備軍和超過十萬官員的複雜官僚機構。在其巔峰時期，羅馬帝國徵稅對象高達一億人，這些稅收財源支持著二十五萬至五十萬士兵的常備軍，一個1500年後仍在使用的道路網絡，以及今天依然舉辦節目的劇院和競技場。當然，我們不應對在古埃及或羅馬帝國運作的“大規模合作網絡”抱有什麼美好幻想。“合作”聽起來非常利他主義，但往往不是自願的，也很少平等。大多數人類合作網絡都是為壓迫和剝削服務的。農民用他們珍貴的食物剩餘支付不斷膨脹的合作網絡，但當稅吏一筆批銷了一整年的辛勤勞動時，他們感到絕望。著名的羅馬競技場通常是由奴隸建造的，以便富有且遊手好閒的羅馬人可以觀看其他奴隸進行殘酷的角斗。即使是監獄和集中營也是合作網絡，只有當成千上萬的陌生人設法協調他們的行動時，它們才能發揮作用。

IN CONGRESS, JULY 4, 1776.

The unanimous Declaration of the thirteen united States of America.

At therefore, the Representatives of the United States of America, in General Congress Assembled, agreeing to the before-said Treaty of the world for the welfare of our inhabitants, as in the Name and by authority of the good People of these colonies, formerly prostrated and divided. That these United Colonies are, and of Right ought to be, Free and Independent States; that they are absolved from all Allegiance unto the British Crown, and that all political connection between them and the State of Great Britain, is, and ought to be totally dissolved; and that as Free and Independent States, they have full Authority by these, combined, to make, and conclude, Aliances, with such States and Powers, and to do all other Acts and Things which Independent States, may of right do. And for the frugality of the Declaration, with other Colonies, over the Prostration of Steven Roush, we, explicitly, pledge to each other our Lives, our Fortune and our sacred Honor.

17. The Declaration of Independence of the United States, signed 4 July 1776 .

All these cooperation networks – from the cities of ancient Mesopotamia to the Qin and Roman empires – were ‘imagined orders’. The social norms that sustained them were based neither on ingrained instincts nor on personal acquaintances, but rather on belief in shared myths.

How can myths sustain entire empires? We have already discussed one such example: Peugeot. Now let's examine two of the best-known myths of history: the Code of Hammurabi of c.1776 BC, which served as a cooperation manual for hundreds of thousands of ancient Babylonians; and

the American Declaration of Independence of 1776 AD , which today still serves as a cooperation manual for hundreds of millions of modern Americans.

17. 美國獨立宣言，簽署於1776年7月4日。從古代美索不達米亞城市到秦朝和羅馬帝國，所有這些合作網絡都是“想象的秩序”。支撐它們的社會規範既不基於根深蒂固的本能，也不基於個人熟悉，而是基於對共同神話的信仰。神話如何維持整個帝國的運作？我們已經討論過其中一個例子：Peugeot。現在讓我們來看看歷史上最著名的兩個神話：約於公元前1776年的漢諾基法典，它作為一個合作手冊為數以百萬計的古巴比倫人提供幫助；還有1776年的美國獨立宣言，它如今仍然作為一個合作手冊，為數以百萬計的現代美國人提供幫助。

In 1776 BC Babylon was the world's biggest city. The Babylonian Empire was probably the world's largest, with more than a million subjects. It ruled most of Mesopotamia, including the bulk of modern Iraq and parts of present-day Syria and Iran. The Babylonian king most famous today was Hammurabi. His fame is due primarily to the text that bears his name, the Code of Hammurabi. This was a collection of laws and judicial decisions whose aim was to present Hammurabi as a role model of a just king, serve as a basis for a more uniform legal system across the Babylonian Empire, and teach future generations what justice is and how a just king acts.

Future generations took notice. The intellectual and bureaucratic elite of ancient Mesopotamia canonised the text, and apprentice scribes continued to copy it long after Hammurabi died and his empire lay in ruins. Hammurabi's Code is therefore a good source for understanding the ancient Mesopotamians' ideal of social order. ³

公元前1776年，巴比倫成為世界上最大的城市。巴比倫帝國可能是世界上最大的帝國，擁有一百多萬臣民。它統治了大部分美索不達米亞地區，包括現代伊拉克的大部分地區以及今天的敘利亞和伊朗的部分地區。最著名的巴比倫國王是漢莫拉比。他的聲譽主要來自於以他的名字命名的漢莫拉比法典。這是一本法律和司法決定的集合，旨在將漢莫拉比作為公正國王的榜樣，為巴比倫帝國建立一個更統一的法律制度，並教導未來幾代人什麼是正義，以及一個公正的國王應該如何行事。未來幾代人注意到了這一點。古代美索不達米亞的知識分子和

官僚精英將這段文本正式確定下來，學徒文士們在漢莫拉比去世以後，仍然在不斷地抄寫著它。因此，漢莫拉比法典是理解古代美索不達米亞人理想社會秩序的良好來源。

The text begins by saying that the gods Anu, Enlil and Marduk – the leading deities of the Mesopotamian pantheon – appointed Hammurabi ‘to make justice prevail in the land, to abolish the wicked and the evil, to prevent the strong from oppressing the weak’. ⁴ It then lists about 300 judgements, given in the set formula ‘If such and such a thing happens, such is the judgment.’ For example, judgements 196–9 and 209–14 read:

196. If a superior man should blind the eye of another superior man, they shall blind his eye.
197. If he should break the bone of another superior man, they shall break his bone.
198. If he should blind the eye of a commoner or break the bone of a commoner, he shall weigh and deliver 60 shekels of silver.
199. If he should blind the eye of a slave of a superior man or break the bone of a slave of a superior man, he shall weigh and deliver one-half of the slave’s value (in silver). ⁵
209. If a superior man strikes a woman of superior class and thereby causes her to miscarry her fetus, he shall weigh and deliver ten shekels of silver for her fetus.
210. If that woman should die, they shall kill his daughter.
211. If he should cause a woman of commoner class to miscarry her fetus by the beating, he shall weigh and deliver five shekels of silver.
212. If that woman should die, he shall weigh and deliver thirty shekels of silver.
213. If he strikes a slave-woman of a superior man and thereby causes her to miscarry her fetus, he shall weigh and deliver two shekels of silver.
214. If that slave-woman should die, he shall weigh and deliver twenty shekels of silver. ⁶

After listing his judgements, Hammurabi again declares that

These are the just decisions which Hammurabi, the able king, has established and thereby has directed the land along the course of truth and the correct way of life ... I am Hammurabi, noble king. I have not been careless or negligent toward humankind, granted to my care by the god Enlil, and with whose shepherding the god Marduk charged me. ⁷

該文本開始說，美索不達米亞神話中領先的神祇阿努、恩利爾和馬杜克任命哈姆拉比“使公義在土地上得到實現，廢除邪惡和邪惡，防止強者壓迫弱者”。⁴然後列舉了大約300個判決，以“如果發生這樣的事情，這就是判決”的固定公式給出。例如，判決196-9和209-14寫道：在列舉了他的判決之後，哈姆拉比再次宣佈：這些都是哈姆拉比這位有能力的國王所制定的公正決定，從而引導土地走向真理和正確的生活方式.....我是貴族國王哈姆拉比。我對人類沒有粗心或疏忽，這些人類是由神恩利賜予我照顧的，並由神馬杜克指示我牧放。⁷

Hammurabi's Code asserts that Babylonian social order is rooted in universal and eternal principles of justice, dictated by the gods. The principle of hierarchy is of paramount importance. According to the code, people are divided into two genders and three classes: superior people, commoners and slaves. Members of each gender and class have different values. The life of a female commoner is worth thirty silver shekels and that of a slave-woman twenty silver shekels, whereas the eye of a male commoner is worth sixty silver shekels.

The code also establishes a strict hierarchy within families, according to which children are not independent persons, but rather the property of their parents. Hence, if one superior man kills the daughter of another superior man, the killer's daughter is executed in punishment. To us it may seem strange that the killer remains unharmed whereas his innocent daughter is killed, but to Hammurabi and the Babylonians this seemed perfectly just. Hammurabi's Code was based on the premise that if the king's subjects all accepted their positions in the hierarchy and acted accordingly, the empire's million inhabitants would be able to cooperate effectively. Their society could then produce enough food for its members, distribute it efficiently,

protect itself against its enemies, and expand its territory so as to acquire more wealth and better security.

漢諾比法典主張巴比倫社會秩序建立在由神所頒布的普遍和永恆的正義原則上。階級原則非常重要。根據法典，人們被分為兩個性別和三個階級：至高無上的人、平民和奴隸。每個性別和階級的成員都有不同的價值。女性平民的生命價值是三十個銀錢，而奴隸女人的價值為二十個銀錢，而一個男性平民的眼睛價值為六十個銀錢。法典還建立了家庭內的嚴格等級制度，根據這個制度，孩子不是獨立的個體，而是父母的財產。因此，如果一個高階男子殺死了另一個高階男子的女兒，那麼謀殺者的女兒就被處以死刑作為懲罰。對我們來說，殺手仍然未受懲罰，而他無辜的女兒則被殺死，這似乎很奇怪，但對漢諾比和巴比倫人來說，這是完全公正的。漢諾比法典的基礎是，如果國王的臣民都接受他們在等級制度中的位置並相應行事，那麼帝國的百萬居民就能夠有效合作。它們的社會就可以為其成員生產足夠的食物，高效分配，保護自己以對抗敵人，擴展領土以獲得更多的財富和更好的安全。

About 3,500 years after Hammurabi's death, the inhabitants of thirteen British colonies in North America felt that the king of England was treating them unjustly. Their representatives gathered in the city of Philadelphia, and on 4 July 1776 the colonies declared that their inhabitants were no longer subjects of the British Crown. Their Declaration of Independence proclaimed universal and eternal principles of justice, which, like those of Hammurabi, were inspired by a divine power. However, the most important principle dictated by the American god was somewhat different from the principle dictated by the gods of Babylon. The American Declaration of Independence asserts that:

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness.

大約三千五百年過去了，自哈莫拉比之死起，北美十三個英屬殖民地的居民覺得英國國王對待他們不公正。他們的代表聚集在費城，於1776年7月4日宣布這些殖民地的居民不再是英國皇冠的臣民。他們的《獨立宣言》宣示了普遍且永恆的正義原則，這些原則與哈莫拉比所

靈感啟發的道德力量一樣。然而，由美國神所主宰的最重要原則與巴比倫之神所主宰的原則略有不同。美國的《獨立宣言》聲言：我們認為這些真理不證自明，即人人生而平等，他們被造物主賦予某些不可剝奪的權利，其中包括生命、自由和追求幸福。

Like Hammurabi's Code, the American founding document promises that if humans act according to its sacred principles, millions of them would be able to cooperate effectively, living safely and peacefully in a just and prosperous society. Like the Code of Hammurabi, the American Declaration of Independence was not just a document of its time and place – it was accepted by future generations as well. For more than 200 years, American schoolchildren have been copying and learning it by heart.

The two texts present us with an obvious dilemma. Both the Code of Hammurabi and the American Declaration of Independence claim to outline universal and eternal principles of justice, but according to the Americans all people are equal, whereas according to the Babylonians people are decidedly unequal. The Americans would, of course, say that they are right, and that Hammurabi is wrong. Hammurabi, naturally, would retort that he is right, and that the Americans are wrong. In fact, they are both wrong. Hammurabi and the American Founding Fathers alike imagined a reality governed by universal and immutable principles of justice, such as equality or hierarchy. Yet the only place where such universal principles exist is in the fertile imagination of Sapiens, and in the myths they invent and tell one another. These principles have no objective validity.

像哈姆拉比法典一样，美国的创国文件承诺，如果人们按照其神圣的原则行事，数百万人将能够有效合作，在一个公正繁荣、安全和平的社会中生活。就像哈姆拉比法典一样，美国的独立宣言不仅仅是当时和当地的文件-它也被未来的一代接受。200多年来，美国学童一直在抄写和背诵它。这两个文本给我们带来了一个明显的困境。哈姆拉比法典和美国独立宣言都声称概述了普遍和永恒的正义原则，但根据美国人的说法，所有一切都是平等的，而根据巴比伦人的说法，人们显然是不平等的。当然，美国人会说他们是正确的，而哈姆拉比是错误的。哈姆拉比自然会反驳说他是正确的，而美国人是错误的。实际上，他们都是错的。哈姆拉比和美国的开国元勋们都想象了一个由普遍和不可变的正义原则所统治的现实，例如平等或等级。然而，这样

的普遍原则只存在于智人的丰富想象力中，以及他们发明和相互讲述的神话中。这些原则没有客观的有效性。

It is easy for us to accept that the division of people into ‘superiors’ and ‘commoners’ is a figment of the imagination. Yet the idea that all humans are equal is also a myth. In what sense do all humans equal one another? Is there any objective reality, outside the human imagination, in which we are truly equal? Are all humans equal to one another biologically? Let us try to translate the most famous line of the American Declaration of Independence into biological terms:

We hold these truths to be self-evident, that all men are **created equal**, that they are **endowed** by their **Creator** with certain **unalienable rights**, that among these are life, **liberty**, and the pursuit of **happiness**.

According to the science of biology, people were not created’. They have evolved. And they certainly did not evolve to be ‘equal’. The idea of equality is inextricably intertwined with the idea of creation. The Americans got the idea of equality from Christianity, which argues that every person has a divinely created soul, and that all souls are equal before God. However, if we do not believe in the Christian myths about God, creation and souls, what does it mean that all people are ‘equal’? Evolution is based on difference, not on equality. Every person carries a somewhat different genetic code, and is exposed from birth to different environmental influences. This leads to the development of different qualities that carry with them different chances of survival. ‘Created equal’ should therefore be translated into ‘evolved differently’.

我們很容易接受人們被分為“優越者”和“普通人”的想法只是想像。然而，所有人都是平等的這種觀念也是一種神話。所有人平等這種說法是根據甚麼而言的？在人類想像之外，有任何客觀的現實是使我們真正平等的嗎？所有人在生物學上是否相等？讓我們試著用生物學的術語來翻譯美國獨立宣言中最著名的一行：我們認為這些真理是不證自明的，即所有人都是平等被創造的，他們被他們的創造者賦予了某些不可剝奪的權利，其中包括生命、自由和追求幸福。根據生物學的科學理論，人類不是被“創造”的，而是進化而來。他們當然不是為了成為“平等”的而進化。平等的概念與創造的概念不可分割。美國人從基

基督教中獲得了平等的概念，基督教認為每個人都有一個神聖的靈魂，並且所有靈魂在上帝面前是平等的。然而，如果我們不相信關於上帝，創造和靈魂的基督教神話，那麼“所有人平等”意味著什麼呢？進化是基於差異，而不是平等。每個人都攜帶著略有不同的基因編碼，並從出生開始接受不同的環境影響。這導致不同的品質的發展帶來了不同的生存機會。因此，“平等被創造”應被翻譯為“不同進化”。

Just as people were never created, neither, according to the science of biology, is there a ‘Creator’ who ‘endows’ them with anything. There is only a blind evolutionary process, devoid of any purpose, leading to the birth of individuals. ‘Endowed by their creator’ should be translated simply into ‘born.

Equally, there are no such things as rights in biology. There are only organs, abilities and characteristics. Birds fly not because they have a right to fly, but because they have wings. And it’s not true that these organs, abilities and characteristics are ‘unalienable’. Many of them undergo constant mutations, and may well be completely lost over time. The ostrich is a bird that lost its ability to fly. So ‘unalienable rights’ should be translated into ‘mutable characteristics’.

根據生物學的科學觀點，人類並非受到一位「創造主」的賦予。生命的來源只是一個毫無目的的漫長演化過程，人類出生的原因也是如此。所以，「由其創造者賦予」應該簡單地翻譯成「出生」。同樣地，生物學中並沒有所謂的權利，只有器官、能力和特徵。鳥兒之所以能飛，不是因為牠們有權利飛翔，而是因為牠們有翅膀。而且，這些器官、能力和特徵並非「不可剝奪的」，很多特質都會不斷變異且最終可能完全消失。鴕鳥就失去了飛行的能力。因此，「不可剝奪的權利」應翻譯成「易變的特徵」。

And what are the characteristics that evolved in humans? ‘Life’, certainly. But ‘liberty’? There is no such thing in biology. Just like equality, rights and limited liability companies, liberty is something that people invented and that exists only in their imagination. From a biological viewpoint, it is meaningless to say that humans in democratic societies are free, whereas humans in dictatorships are unfree. And what about ‘happiness’? So far biological research has failed to come up with a clear definition of happiness

or a way to measure it objectively. Most biological studies acknowledge only the existence of pleasure, which is more easily defined and measured. So ‘life, liberty, and the pursuit of happiness’ should be translated into ‘life and the pursuit of pleasure’.

在人類進化中出現了哪些特徵呢？「生命」，當然。但是「自由」呢？這在生物學中並不存在。就像平等、權利和有限責任公司一樣，自由是人們發明的東西，只存在於他們的想像中。從生物學的角度來看，說民主社會中的人是自由的，而獨裁社會中的人是不自由的，是毫無意義的。那「幸福」呢？到目前為止，生物研究未能提出幸福的明確定義或客觀測量方式。大多數生物學研究只承認愉悅的存在，這一點更容易定義和測量。因此，“生命、自由和追求幸福”應該被翻譯為“生命和追求快樂”。

So here is that line from the American Declaration of Independence translated into biological terms:

We hold these truths to be self-evident, that all men evolved differently, that they are born with certain mutable characteristics, and that among these are life and the pursuit of pleasure.

Advocates of equality and human rights may be outraged by this line of reasoning. Their response is likely to be, ‘We know that people are not equal biologically! But if we believe that we are all equal in essence, it will enable us to create a stable and prosperous society.’ I have no argument with that. This is exactly what I mean by ‘imagined order’. We believe in a particular order not because it is objectively true, but because believing in it enables us to cooperate effectively and forge a better society. Imagined orders are not evil conspiracies or useless mirages. Rather, they are the only way large numbers of humans can cooperate effectively. Bear in mind, though, that Hammurabi might have defended his principle of hierarchy using the same logic: ‘I know that superiors, commoners and slaves are not inherently different kinds of people. But if we believe that they are, it will enable us to create a stable and prosperous society.’

以下是美國獨立宣言中的那句話用生物學術語翻譯的內容：我們堅信這些真理不證自明：所有人的進化過程不同，他們出生時具有某些可

變特徵，其中包括生命和追求快感。平等和人權的倡導者可能會對這種推理感到憤慨。他們的回應可能是：“我們知道生物學上人們並非平等，但是如果我們相信我們本質上是平等的，這將使我們能夠創造一個穩定和繁榮的社會。”我的意見沒有任何爭議。這正是我所指的“想象中的秩序”。我們相信某種特定的秩序，不是因為它具有客觀真實性，而是因為相信它能夠使我們有效地合作並建立一個更美好的社會。想象中的秩序不是邪惡的陰謀或毫無用處的幻象。反而，它們是大量人類能夠有效合作的唯一方式。請牢記，然而，哈米拉比可能會使用相同的邏輯來捍衛他對等級原則的觀點：“我知道上級、平民和奴隸並不是本質上不同種類的人。但是如果我們相信他們是不同的，這將使我們能夠建立穩定和繁榮的社會。”

True Believers

It's likely that more than a few readers squirmed in their chairs while reading the preceding paragraphs. Most of us today are educated to react in such a way. It is easy to accept that Hammurabi's Code was a myth, but we do not want to hear that human rights are also a myth. If people realise that human rights exist only in the imagination, isn't there a danger that our society will collapse? Voltaire said about God that 'there is no God, but don't tell that to my servant, lest he murder me at night'. Hammurabi would have said the same about his principle of hierarchy, and Thomas Jefferson about human rights. *Homo sapiens* has no natural rights, just as spiders, hyenas and chimpanzees have no natural rights. But don't tell that to our servants, lest they murder us at night.

許多讀者可能在看前面幾段時不自覺地坐立難安。今天大多數人的教育使我們對這樣的反應產生了習慣性的認知。我們可以輕易地接受「漢諾威比法典」只是一個神話，但是我們不希望聽到人權也只是一個神話。如果人們意識到人權只存在於想像之中，那麼我們的社會就可能會崩潰。伏爾泰曾經說過：「上帝是不存在的，但是不要告訴我的僕人，以免他晚上來謀害我。」漢諾威比對於他的等級原則，托馬斯·傑斐遜對於人權也有同樣的看法。智人沒有自然權利，就像蜘蛛、土狼和黑猩猩也沒有自然權利。但是，不要讓我們的僕人知道這一點，以免他們在夜裡謀害我們。

Such fears are well justified. A natural order is a stable order. There is no chance that gravity will cease to function tomorrow, even if people stop believing in it. In contrast, an imagined order is always in danger of collapse, because it depends upon myths, and myths vanish once people stop believing in them. In order to safeguard an imagined order, continuous and strenuous efforts are imperative. Some of these efforts take the shape of violence and coercion. Armies, police forces, courts and prisons are ceaselessly at work forcing people to act in accordance with the imagined order. If an ancient Babylonian blinded his neighbour, some violence was usually necessary in order to enforce the law of 'an eye for an eye'. When, in 1860, a majority of American citizens concluded that African slaves are human beings and must therefore enjoy the right of liberty, it took a bloody civil war to make the southern states acquiesce.

這樣的恐懼是有道理的。自然秩序是穩定的秩序。即使人們停止相信，地心引力也不可能明天停止運作。相比之下，一個想像的秩序總是面臨崩潰的危險，因為它依賴神話，而神話一旦人們停止相信就會消失。為了保護一個想像的秩序，必須進行不斷的努力。其中一些努力採取暴力和強制的形式。軍隊、警察部隊、法院和監獄不斷地迫使人們按照想象的秩序行事。如果一個古老的巴比倫人使他的鄰居失明，通常需要一些暴力來強制執法“以眼還眼”的法律。當在1860年，大多數美國公民得出結論，非洲奴隸是人類，必須享有自由的權利時，需要一場流血的內戰才能讓南方州服從。

However, an imagined order cannot be sustained by violence alone. It requires some true believers as well. Prince Talleyrand, who began his chameleon-like career under Louis XVI, later served the revolutionary and Napoleonic regimes, and switched loyalties in time to end his days working for the restored monarchy, summed up decades of governmental experience by saying that 'You can do many things with bayonets, but it is rather uncomfortable to sit on them.' A single priest often does the work of a hundred soldiers far more cheaply and effectively. Moreover, no matter how efficient bayonets are, somebody must wield them. Why should the soldiers, jailors, judges and police maintain an imagined order in which they do not believe? Of all human collective activities, the one most difficult to organise is violence. To say that a social order is maintained by military force immediately raises the question: what maintains the military order? It is

impossible to organise an army solely by coercion. At least some of the commanders and soldiers must truly believe in something, be it God, honour, motherland, manhood or money.

一個虛構的秩序不能僅僅靠暴力維持，也需要一些真信徒。塔列朗王子始於路易十六統治時期的變色龍般生涯，後來侍奉了革命和拿破崙政權，最後轉向效勞被恢復的君主制度。他通過說“你可以用刺刀做許多事情，但是坐在上面相當不舒服”總結了幾十年的政府經驗。一個神父通常可以比一百名士兵更便宜、更有效地完成工作。此外，無論刺刀的效率有多高，也必須有人去操作。為什麼士兵、監獄管理員、法官和警察會維持一個他們不信任的虛構秩序呢？在所有人類集體活動中，組織暴力是最難的一個。聲稱一個社會秩序是由軍事力量維持的，立即引出一個問題：是什麼維持了軍事秩序？單靠強制是無法組織起一支軍隊的。至少有一些指揮官和士兵必須真正相信某些東西，無論是上帝，榮譽，祖國，男人氣概還是金錢。

An even more interesting question concerns those standing at the top of the social pyramid. Why should they wish to enforce an imagined order if they themselves don't believe in it? It is quite common to argue that the elite may do so out of cynical greed. Yet a cynic who believes in nothing is unlikely to be greedy. It does not take much to provide the objective biological needs of *Homo sapiens*. After those needs are met, more money can be spent on building pyramids, taking holidays around the world, financing election campaigns, funding your favourite terrorist organisation, or investing in the stock market and making yet more money – all of which are activities that a true cynic would find utterly meaningless. Diogenes, the Greek philosopher who founded the Cynical school, lived in a barrel. When Alexander the Great once visited Diogenes as he was relaxing in the sun, and asked if there were anything he might do for him, the Cynic answered the all-powerful conqueror, ‘Yes, there is something you can do for me. Please move a little to the side. You are blocking the sunlight.’

更有趣的問題是關於站在社會金字塔頂端的那些人。如果他們自己不相信，為什麼要強制執行一個想像的秩序呢？普遍的論點是，精英可能因為愛慕虛榮而這麼做。然而，一個不相信任何事物的懷疑論者不太可能貪婪。提供人類智慧所需的客觀生物學需要並不需要太多。在滿足這些需求之後，可以花更多的錢建造金字塔，周遊世界，資助選

舉活動，資助您最喜愛的恐怖組織，或者投資股票市場並賺取更多的錢，所有這些都是真正的懷疑論者會覺得毫無意義的活動。希臘哲學家底格尼斯建立了犬儒主義學派，並居住在一個木桶裡。當亞歷山大大帝一次訪問正在陽光下放鬆身心的底格尼斯，並問是否有什麼可以幫忙的地方時，這位犬儒主義者回答全能的征服者：“是的，你可以幫我一個忙。請移動一點點，你擋住了陽光。”

This is why cynics don't build empires and why an imagined order can be maintained only if large segments of the population – and in particular large segments of the elite and the security forces – truly believe in it. Christianity would not have lasted 2,000 years if the majority of bishops and priests failed to believe in Christ. American democracy would not have lasted 250 years if the majority of presidents and congressmen failed to believe in human rights. The modern economic system would not have lasted a single day if the majority of investors and bankers failed to believe in capitalism.

The Prison Walls

How do you cause people to believe in an imagined order such as Christianity, democracy or capitalism? First, you never admit that the order is imagined. You always insist that the order sustaining society is an objective reality created by the great gods or by the laws of nature. People are unequal, not because Hammurabi said so, but because Enlil and Marduk decreed it. People are equal, not because Thomas Jefferson said so, but because God created them that way. Free markets are the best economic system, not because Adam Smith said so, but because these are the immutable laws of nature.

這就是為什麼懷疑論者無法建立帝國的原因，並且只有在大多數人口（特別是精英團體和安全力量的大多數）真正相信的情況下，一個想像中的秩序才能維持。如果大多數主教和牧師不相信基督，在基督教不會持續2000年。如果大多數總統和國會議員不相信人權，美國民主也不會持續250年。現代經濟體系不會持續一天，如果大多數投資者和銀行家不相信資本主義。那麼，如何讓人們相信基督教、民主或資本主義等想像中的秩序呢？首先，您永遠不要承認這個秩序是想像中的。您始終要堅持，支撐社會的秩序是由偉大的神或自然法則創造的

客觀現實。人們的不平等不是因為漢穆拉比這麼說，而是因為恩利爾和瑪杜克這樣下令。人民平等，不是因為托馬斯·杰斐遜這麼說，而是因為上帝創造了他們。自由市場是最好的經濟體系，不是因為亞當·斯密這樣說，而是因為這些是自然界的不變法則。

You also educate people thoroughly. From the moment they are born, you constantly remind them of the principles of the imagined order, which are incorporated into anything and everything. They are incorporated into fairy tales, dramas, paintings, songs, etiquette, political propaganda, architecture, recipes and fashions. For example, today people believe in equality, so it's fashionable for rich kids to wear jeans, which were originally working-class attire. In the Middle Ages people believed in class divisions, so no young nobleman would have worn a peasant's smock. Back then, to be addressed as 'Sir' or 'Madam' was a rare privilege reserved for the nobility, and often purchased with blood. Today all polite correspondence, regardless of the recipient, begins with 'Dear Sir or Madam'.

您也徹底教育人民。從他們出生的那一刻起，您不斷地提醒他們虛擬秩序的原則，這些原則融入了任何事物和一切。它們融入了童話、戲劇、繪畫、歌曲、禮儀、政治宣傳、建築、食譜和時尚中。例如，今天人們相信平等，所以富家子弟穿著牛仔褲是時尚，而最初是工人階級的服裝。中世紀人們相信階級分化，所以年輕貴族是不會穿著農民的工作服的。當時被稱為“先生”或“夫人”是貴族的罕見特權，通常是以血的代價購買的。今天，無論收件人是誰，所有的禮貌信函都以“尊敬的先生或夫人”開始。

The humanities and social sciences devote most of their energies to explaining exactly how the imagined order is woven into the tapestry of life. In the limited space at our disposal we can only scratch the surface. Three main factors prevent people from realising that the order organising their lives exists only in their imagination:

a. The imagined order is embedded in the material world. Though the imagined order exists only in our minds, it can be woven into the material reality around us, and even set in stone. Most Westerners today believe in individualism. They believe that every human is an individual, whose worth does not depend on what other people think of him or her. Each of us has

within ourselves a brilliant ray of light that gives value and meaning to our lives. In modern Western schools teachers and parents tell children that if their classmates make fun of them, they should ignore it. Only they themselves, not others, know their true worth.

人文與社會科學的大部分精力都用於解釋想像秩序如何編織成生活的環節。考慮到篇幅所限，我們只能粗略概述。其中有三個主要因素，阻止人們意識到主導其生命的秩序僅存在於腦海之中：a. 想像秩序已植根於物質世界之中。儘管想像秩序僅存在於我們的思想中，它可以被編織入我們周圍的物質現實中，甚至可以被確立為不可撼動的定律。今天，大多數西方人都相信個人主義。他們相信每個人都是一個個體，其價值並不取決於其他人對他或她的看法。我們中每個人都有一束明亮的光芒，為我們的生命賦予價值和意義。在現代西方學校中，老師和家長告訴孩子們，如果同學取笑他們，他們應該忽略。只有他們自己，而不是別人，才知道自己真正的價值。

In modern architecture, this myth leaps out of the imagination to take shape in stone and mortar. The ideal modern house is divided into many small rooms so that each child can have a private space, hidden from view, providing for maximum autonomy. This private room almost invariably has a door, and in many households it is accepted practice for the child to close, and perhaps lock, the door. Even parents are forbidden to enter without knocking and asking permission. The room is decorated as the child sees fit, with rock-star posters on the wall and dirty socks on the floor. Somebody growing up in such a space cannot help but imagine himself 'an individual', his true worth emanating from within rather than from without.

Medieval noblemen did not believe in individualism. Someone's worth was determined by their place in the social hierarchy, and by what other people said about them. Being laughed at was a horrible indignity. Noblemen taught their children to protect their good name whatever the cost. Like modern individualism, the medieval value system left the imagination and was manifested in the stone of medieval castles. The castle rarely contained private rooms for children (or anyone else, for that matter). The teenage son of a medieval baron did not have a private room on the castle's second floor, with posters of Richard the Lionheart and King Arthur on the walls and a locked door that his parents were not allowed to open. He slept alongside

many other youths in a large hall. He was always on display and always had to take into account what others saw and said. Someone growing up in such conditions naturally concluded that a man's true worth was determined by his place in the social hierarchy and by what other people said of him.⁸

在現代建築中，這個神話躍然想像，成為石頭和灰泥的形式。理想的現代房屋被劃分成許多小房間，使每個孩子都能有一個隱蔽的私人空間，不受他人觀察，提供最大的自主權。這個私人空間幾乎總是有一扇門，許多家庭通常會允許孩子關上並可能鎖上門。甚至父母也被禁止沒有敲門並徵求許可就入內。房間的裝飾由孩子自由安排，牆上掛著搖滾明星的海報，地上放著骯髒的襪子。在這樣的空間中成長的人無法不想象自己是一個“個體”，他的真正價值來源於內在而不是外在。中世紀貴族不相信個人主義。一個人的價值取決於他們在社會等級制度中的地位，以及他人對他們的評價。被嘲笑是一種可怕的侮辱。貴族教導他們的孩子不惜代價保護自己的聲譽。就像現代個人主義一樣，中世紀價值體系也脫離了想象，表現在中世紀城堡的石頭上。城堡很少包含孩子（或其他人）的私人房間。中世紀男爵的十幾歲兒子沒有一個在城堡二樓的私人房間，牆上掛著理查德獅心和亞瑟王的海報，門鎖著他的父母不被允許進入。他和許多其他年輕人一起睡在一個大廳中。他總是被展示給他人觀察，時刻考慮著別人看到和說出來的話。在這種環境中成長的人自然會得出這樣的結論：一個人的真正價值取決於他在社會等級制度中的地位，以及他人對他的評價。

b. The imagined order shapes our desires . Most people do not wish to accept that the order governing their lives is imaginary, but in fact every person is born into a pre-existing imagined order, and his or her desires are shaped from birth by its dominant myths. Our personal desires thereby become the imagined order's most important defences.

For instance, the most cherished desires of present-day Westerners are shaped by romantic, nationalist, capitalist and humanist myths that have been around for centuries. Friends giving advice often tell each other, 'Follow your heart.' But the heart is a double agent that usually takes its instructions from the dominant myths of the day, and the very recommendation to 'Follow your heart' was implanted in our minds by a combination of nineteenth-century Romantic myths and twentieth-century consumerist myths. The Coca-

Cola Company, for example, has marketed Diet Coke around the world under the slogan, ‘Diet Coke. Do what feels good.’

b. 想象的秩序塑造了我們的慾望。大多數人不希望接受他們生活中的秩序是虛構的，但事實上，每個人都是生來進入一個現成的想象秩序，他或她的慾望是從出生時就被它主導的神話所塑造的。因此，我們的個人慾望成為想象秩序最重要的防禦。例如，現代西方人最珍視的慾望是由浪漫主義、民族主義、資本主義和人本主義神話所塑造的，這些神話已經存在了數個世紀。朋友們經常互相建議：“跟隨自己的心。”但是心是一個雙重特工，通常從當天的主流神話中接受命令，而“跟隨自己的心”的建議是由十九世紀的浪漫主義神話和二十世紀的消費主義神話的結合植入我們的思想中的。例如，可口可樂公司在全球推廣輕醇可樂時使用了“輕醇可樂。做自己喜歡的事。”的口號。

Even what people take to be their most personal desires are usually programmed by the imagined order. Let's consider, for example, the popular desire to take a holiday abroad. There is nothing natural or obvious about this. A chimpanzee alpha male would never think of using his power in order to go on holiday into the territory of a neighbouring chimpanzee band. The elite of ancient Egypt spent their fortunes building pyramids and having their corpses mummified, but none of them thought of going shopping in Babylon or taking a skiing holiday in Phoenicia. People today spend a great deal of money on holidays abroad because they are true believers in the myths of romantic consumerism.

Romanticism tells us that in order to make the most of our human potential we must have as many different experiences as we can. We must open ourselves to a wide spectrum of emotions; we must sample various kinds of relationships; we must try different cuisines; we must learn to appreciate different styles of music. One of the best ways to do all that is to break free from our daily routine, leave behind our familiar setting, and go travelling in distant lands, where we can ‘experience’ the culture, the smells, the tastes and the norms of other people. We hear again and again the romantic myths about ‘how a new experience opened my eyes and changed my life’.

人們所認為的最個人化的欲望，通常也是由想像中的秩序所規劃。例如，讓我們考慮一下廣受歡迎的出國渡假的願望。這並不是自然或顯

而易見的。黑猩猩的領導猿從不會想到利用自己的權力去渡假到鄰近黑猩猩團體的領土。古埃及的精英們花費大量財富建造金字塔，將自己的屍體保存完好，但他們中沒有人想著到巴比倫購物或在腓尼基滑雪。如今人們為了信仰浪漫消費主義的神話，花費大量金錢出國渡假。浪漫主義告訴我們，為了最大限度地發揮人類的潛力，我們必須擁有盡可能多的不同經歷。我們必須打開自己對於各種情感的廣泛譜系，體驗各種不同的關係，嚐試不同的美食，學習欣賞不同風格的音樂。為了做到這一切，其中一個最好的方法就是打破日常例行，離開熟悉的環境，前往遠方旅行，在那裡我們可以“體驗”其他人的文化、氣味、口感和規範。我們一遍又一遍地聽到關於“新體驗如何開啟我的眼界並改變我的人生”的浪漫神話。

Consumerism tells us that in order to be happy we must consume as many products and services as possible. If we feel that something is missing or not quite right, then we probably need to buy a product (a car, new clothes, organic food) or a service (housekeeping, relationship therapy, yoga classes). Every television commercial is another little legend about how consuming some product or service will make life better.

Romanticism, which encourages variety, meshes perfectly with consumerism. Their marriage has given birth to the infinite ‘market of experiences’, on which the modern tourism industry is founded. The tourism industry does not sell flight tickets and hotel bedrooms. It sells experiences. Paris is not a city, nor India a country – they are both experiences, the consumption of which is supposed to widen our horizons, fulfil our human potential, and make us happier. Consequently, when the relationship between a millionaire and his wife is going through a rocky patch, he takes her on an expensive trip to Paris. The trip is not a reflection of some independent desire, but rather of an ardent belief in the myths of romantic consumerism. A wealthy man in ancient Egypt would never have dreamed of solving a relationship crisis by taking his wife on holiday to Babylon. Instead, he might have built for her the sumptuous tomb she had always wanted.

消費主義教導我們：為了快樂，我們必須盡可能消費更多的產品和服務。如果我們覺得缺少什麼或不太對勁，那麼我們可能需要購買產品（汽車、新衣服、有機食品）或服務（家政服務、關係治療、瑜伽課程）。每個電視商業廣告都是關於如何通過消費某些產品或服務讓生

活更美好的另一個小故事。浪漫主義鼓勵多樣性，與消費主義完美地結合在一起。他們的結合孕育了無限的“體驗市場”，現代旅遊業就是建立在此基礎上的。旅遊業不賣機票和旅館房間，它銷售的是體驗。巴黎並不是一個城市，印度也不是一個國家 - 它們都是體驗，消費這些體驗應該可以擴展我們的視野，實現我們的人類潛能，讓我們更幸福。因此，當一個百萬富翁和他的妻子感情出現問題時，他會帶她去昂貴的巴黎之旅。這次旅行並不反映出獨立的願望，而是對浪漫消費主義神話的強烈信仰。在古埃及，一個富有的男人永遠不會夢想通過帶他的妻子去巴比倫度假來解決關係危機，而是他可能會為她建造她一直想要的壯麗墳墓。



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.

18. 吉薩金字塔。古埃及富人的用錢方式。就像古埃及的精英一樣，大多數文化中的大多數人都把生活奉獻給建造金字塔。這些金字塔的名稱、形狀和大小從一個文化到另一個文化都不同。它們可能採取的形式是像市郊小屋一樣，帶有游泳池和常青草坪，或者是一個光耀的頂層公寓，擁有令人羨慕的景色。很少有人質疑我們渴望金字塔的神話。c. 想像中的秩序是互為主觀的。即使我通過超人的努力成功地從想像中解放了自己的個人慾望，但我只是一個人。為了改變想像中的秩序，我必須說服數百萬陌生人與我合作。因為想像的秩序不是存在於我個人的想像中的主觀秩序，而是存在於成千上萬的人們共享的想像中的互為主觀的秩序。

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 consciousness,

and when the child grows up and ceases to believe in it, the imaginary friend fades away.

為了理解這一點，我們需要了解「客觀」、「主觀」和「客觀交主觀」之間的區別。客觀現象獨立於人類意識和信念之外存在。例如，放射性不是虛構的。放射性散發早在人們發現之前就已經存在，即使人們不相信它們的存在，它們也是危險的。放射性物質發現者之一瑪麗居里在長期研究放射性材料的歲月中，並不知道它們會危害她的身體。雖然她不相信放射性會殺死她，但由於長時間接觸放射性材料而導致的再生障礙性貧血，她還是死亡了。主觀是一個存在於單一個體意識和信念之中的事物。如果該個體的信念發生改變，它就會消失或發生變化。許多孩子都相信自己的想像朋友存在，但對於世界上其他人來說，這個想像朋友既看不見也聽不到。這個想像朋友僅存在於孩子的主觀意識之中；當他長大並不再相信時，這個想像朋友就會消失。

The **inter-subjective** is something that exists within the communication network linking the subjective consciousness of many individuals. If a single individual changes his or her beliefs, or even dies, it is of little importance. However, if most individuals in the network die or change their beliefs, the inter-subjective phenomenon will mutate or disappear. Inter-subjective phenomena are neither malevolent frauds nor insignificant charades. They exist in a different way from physical phenomena such as radioactivity, but their impact on the world may still be enormous. Many of history's most important drivers are inter-subjective: law, money, gods, nations.

Peugeot, for example, is not the imaginary friend of Peugeot's CEO. The company exists in the shared imagination of millions of people. The CEO believes in the company's existence because the board of directors also believes in it, as do the company's lawyers, the secretaries in the nearby office, the tellers in the bank, the brokers on the stock exchange, and car dealers from France to Australia. If the CEO alone were suddenly to stop believing in Peugeot's existence, he'd quickly land in the nearest mental hospital and someone else would occupy his office.

客觀互為主體是存在於連接多個個體主觀意識的通訊網絡內的東西。如果單個個體改變其信仰，甚至死亡，這沒有太大的重要性。然而，

如果網絡中的大部分個體死亡或改變信仰，客觀互為主體現象將變異或消失。客觀互為主體現象既不是惡意欺詐，也不是無關緊要的表演。它們存在於與放射性等物理現象不同的方式，但對世界的影響可能仍然是巨大的。歷史上許多最重要的驅動力都是客觀互為主體的：法律、貨幣、神靈、民族等。例如，Peugeot不是Peugeot的CEO的想像朋友。這個公司存在於數百萬人的共同想象中。CEO相信公司的存在，因為董事會也相信，公司的律師、附近辦公室的秘書、銀行的出納員、股票交易所的經紀人以及來自法國到澳大利亞的汽車經銷商都相信。如果只有CEO突然不再相信Peugeot的存在，他很快就會被送進最近的精神病院，別人會取代他的位置。

Similarly, the dollar, human rights and the United States of America exist in the shared imagination of billions, and no single individual can threaten their existence. If I alone were to stop believing in the dollar, in human rights, or in the United States, it wouldn't much matter. These imagined orders are inter-subjective, so in order to change them we must simultaneously change the consciousness of billions of people, which is not easy. A change of such magnitude can be accomplished only with the help of a complex organisation, such as a political party, an ideological movement, or a religious cult. However, in order to establish such complex organisations, it's necessary to convince many strangers to cooperate with one another. And this will happen only if these strangers believe in some shared myths. It follows that in order to change an existing imagined order, we must first believe in an alternative imagined order.

同樣地，美元、人權和美國這些存在於數十億人共同的想像中，沒有一個人可以威脅它們的存在。如果只有我一個人不再相信美元、人權或美國，那也不會對它們有太大的影響。這些想像中的秩序是相互主觀的，所以要改變它們，我們必須同時改變數十億人的意識，這並不容易。這樣重大的變化只能通過一個複雜的組織實現，比如政治黨派、意識形態運動或宗教邪教。然而，要建立這樣的複雜組織，必須說服許多陌生人彼此合作。這只有當這些陌生人相信共有的神話時才會發生。因此，要改變現有的想像秩序，我們必須先相信另一個想像秩序。

In order to dismantle Peugeot, for example, we need to imagine something more powerful, such as the French legal system. In order to dismantle the

French legal system we need to imagine something even more powerful, such as the French state. And if we would like to dismantle that too, we will have to imagine something yet more powerful.

There is no way out of the imagined order. When we break down our prison walls and run towards freedom, we are in fact running into the more spacious exercise yard of a bigger prison.

為了拆除標致汽車（Peugeot），例如，我們需要想像更強大的東西，如法國的法律制度。為了拆除法國的法律制度，我們需要想像更強大的東西，如法國政府。如果我們想要拆除那個，我們必須想像更加強大的東西。無論如何，我們離不開想像中的秩序。當我們打破監獄的牆壁，奔向自由時，事實上我們跑進了更大監獄的更寬敞的鬆露場。

Memory Overload

EVOLUTION DID NOT ENDOW HUMANS with the ability to play football. True, it produced legs for kicking, elbows for fouling and mouths for cursing, but all that this enables us to do is perhaps practise penalty kicks by ourselves. To get into a game with the strangers we find in the schoolyard on any given afternoon, we not only have to work in concert with ten teammates we may never have met before, we also need to know that the eleven players on the opposing team are playing by the same rules. Other animals that engage strangers in ritualised aggression do so largely by instinct – puppies throughout the world have the rules for rough-and-tumble play hard-wired into their genes. But human teenagers have no genes for football. They can nevertheless play the game with complete strangers because they have all learned an identical set of ideas about football. These ideas are entirely imaginary, but if everyone shares them, we can all play the game.

進化並未賦予人類踢足球的能力。雖然進化讓我們擁有踢球的腿，犯規時的手肘還有發出咒罵時的口，但這些僅能讓我們自己練習罰球。如果想和學校操場上的陌生人進行比賽，我們不僅需要和10個從未見過的隊友一起合作，還需要知道對面的11名球員也遵守相同的規則。其他以儀式化的侵略來接觸陌生人的動物主要靠本能——全球各地的小狗天生就懂得玩耍的規則。然而，人類青少年沒有踢足球的基因。如果大家都學會了完全相同的足球理念，儘管這些理念純屬想象，我們也能和完全陌生的人一起踢球。

The same applies, on a larger scale, to kingdoms, churches and trade networks, with one important difference. The rules of football are relatively simple and concise, much like those necessary for cooperation in a forager band or small village. Each player can easily store them in his brain and still have room for songs, images and shopping lists. But large systems of

cooperation that involve not twenty-two but thousands or even millions of humans require the handling and storage of huge amounts of information, much more than any single human brain can contain and process.

The large societies found in some other species, such as ants and bees, are stable and resilient because most of the information needed to sustain them is encoded in the genome. A female honeybee larva can, for example, grow up to be either a queen or a worker, depending on what food it is fed. Its DNA programmes the necessary behaviours for whatever role it will fulfil in life. Hives can be very complex social structures, containing many different kinds of workers, such as harvesters, nurses and cleaners. But so far researchers have failed to locate lawyer bees. Bees don't need lawyers, because there is no danger that they might forget or violate the hive constitution. The queen does not cheat the cleaner bees of their food, and they never go on strike demanding higher wages.

這個觀念適用於更大範圍的王國、教堂和貿易網絡，但有一個重要的不同之處。足球的規則相對簡單明瞭，就像是狩獵採集社區或小村莊合作所需的規則一樣。每位球員都可以輕鬆地將它們存在腦海中，還有足夠的空間存儲歌曲、圖像和購物清單。但是涉及數千甚至百萬人的大型合作系統需要處理和存儲大量的信息，遠超出單個人類大腦所能容納和處理的範圍。某些其他物種中發現的大型社會結構，如螞蟻和蜜蜂，之所以穩定且具彈性，是因為支撐它們所需的大部分信息已編碼在基因中。例如，一個女蜜蜂幼蟲可以成長為女王或工蜂，具體取決於它所吃的食物。它的DNA編程了它在生活中扮演任何角色所需的行為。蜂巢可以是非常複雜的社會結構，包含許多不同種類的工蜂，例如收割工、護士和清潔工。但是到目前為止，研究人員還沒有發現有律師蜜蜂。蜜蜂不需要律師，因為它們不會忘記或違反蜂巢憲章，蜂后也不會騙取清潔工蜂的食物，而它們也不會罷工要求加薪。

But humans do such things all the time. Because the Sapiens social order is imagined, humans cannot preserve the critical information for running it simply by making copies of their DNA and passing these on to their progeny. A conscious effort has to be made to sustain laws, customs, procedures and manners, otherwise the social order would quickly collapse. For example, King Hammurabi decreed that people are divided into superiors, commoners and slaves. Unlike the beehive class system, this is not a natural division –

there is no trace of it in the human genome. If the Babylonians could not keep this ‘truth’ in mind, their society would have ceased to function. Similarly, when Hammurabi passed his DNA to his offspring, it did not encode his ruling that a superior man who killed a commoner woman must pay thirty silver shekels. Hammurabi deliberately had to instruct his sons in the laws of his empire, and his sons and grandsons had to do the same.

然而，人類常常這樣做。因為智人社會秩序是想像出來的，人類無法僅通過複製DNA並將其傳遞給後代來保存運行所需的關鍵信息。必須有有意識的努力來維持法律、習俗、程序和禮儀，否則社會秩序很快就會崩潰。例如，漢諾比王制定了人分為上層人、平民和奴隸的法令。這不是蜜蜂等級制度般的自然分割方式，人類基因中沒有這樣的痕跡。如果巴比倫人無法牢記這個「真理」，他們的社會就會停止運作。同樣，當漢諾比把他的DNA傳給他的後代時，它並未編碼他的統治法則，例如，一個上層人杀死一个平民妇女必须支付三十个銀币。漢諾比不得不故意教導他的兒子帝國的法律，他的兒子和孫子也必須這樣做。

Empires generate huge amounts of information. Beyond laws, empires have to keep accounts of transactions and taxes, inventories of military supplies and merchant vessels, and calendars of festivals and victories. For millions of years people stored information in a single place – their brains. Unfortunately, the human brain is not a good storage device for empire-sized databases, for three main reasons.

First, its capacity is limited. True, some people have astonishing memories, and in ancient times there were memory professionals who could store in their heads the topographies of whole provinces and the law codes of entire states. Nevertheless, there is a limit that even master mnemonists cannot transcend. A lawyer might know by heart the entire law code of the Commonwealth of Massachusetts, but not the details of every legal proceeding that took place in Massachusetts from the Salem witch trials onward.

帝國會產生大量資訊。除了法律外，帝國必須對交易和稅收進行會計，監督軍事供應和商船庫存，還要記錄節慶和勝利的日曆。數百萬年來，人們將信息存儲在一個地方——大腦中。不幸的是，人類大腦

對於龐大的領域數據庫並不是一個好的存儲設備，原因有三。首先，其容量有限。確實，有些人具有驚人的記憶力，古代也有記憶專家能將整個省份的地形和整個州的法律典籍儲存在自己的腦中。然而，即使是最優秀的記憶者也有極限。一名律師可能會記得馬薩諸塞州的整個法典，但不會記得自塞勒姆女巫審判以來馬薩諸塞州每次訴訟的詳細信息。

Secondly, humans die, and their brains die with them. Any information stored in a brain will be erased in less than a century. It is, of course, possible to pass memories from one brain to another, but after a few transmissions, the information tends to get garbled or lost.

Thirdly and most importantly, the human brain has been adapted to store and process only particular types of information. In order to survive, ancient hunter-gatherers had to remember the shapes, qualities and behaviour patterns of thousands of plant and animal species. They had to remember that a wrinkled yellow mushroom growing in autumn under an elm tree is most probably poisonous, whereas a similar-looking mushroom growing in winter under an oak tree is a good stomach-ache remedy. Hunter-gatherers also had to bear in mind the opinions and relations of several dozen band members. If Lucy needed a band member's help to get John to stop harassing her, it was important for her to remember that John had fallen out last week with Mary, who would thus be a likely and enthusiastic ally. Consequently, evolutionary pressures have adapted the human brain to store immense quantities of botanical, zoological, topographical and social information.

其次，人們會死亡，他們的大腦也會隨之消逝。任何存儲在大腦中的信息都將在不到一個世紀的時間內被抹去。當然，將記憶從一個大腦傳遞到另一個大腦是可能的，但在幾次傳輸後，信息往往會變得模糊或遺失。第三，也是最重要的是，人類大腦已經適應了存儲和處理特定類型的信息。為了生存，古代狩獵採集者必須記住成千上萬種植物和動物的形狀、品質和行為模式。他們必須記住，在榆樹下秋天生長的一種皺巴巴的黃色蘑菇很可能是有毒的，而在橡樹下冬天生長的一種看起來很相似的蘑菇是治療胃痛的良藥。狩獵採集者還必須牢記幾十個團隊成員的意見和關係。如果露西需要一個團隊成員的幫助，讓約翰停止騷擾她，她必須記住約翰上週已經與瑪麗意見不合，因此她

很可能會成為一個熱心的盟友。因此，進化的壓力已經使人類大腦適應了存儲大量植物、動物、地形和社會信息的能力。

But when particularly complex societies began to appear in the wake of the Agricultural Revolution, a completely new type of information became vital – numbers. Foragers were never obliged to handle large amounts of mathematical data. No forager needed to remember, say, the number of fruit on each tree in the forest. So human brains did not adapt to storing and processing numbers. Yet in order to maintain a large kingdom, mathematical data was vital. It was never enough to legislate laws and tell stories about guardian gods. One also had to collect taxes. In order to tax hundreds of thousands of people, it was imperative to collect data about peoples incomes and possessions; data about payments made; data about arrears, debts and fines; data about discounts and exemptions. This added up to millions of data bits, which had to be stored and processed. Without this capacity, the state would never know what resources it had and what further resources it could tap. When confronted with the need to memorise, recall and handle all these numbers, most human brains overdosed or fell asleep.

當農業革命後開始出現特殊複雜的社會時，數字成為一種全新的重要資訊。狩獵採集者從未需要處理大量的數學資料。沒有一個狩獵採集者需要記住例如森林裡每個樹上的水果數量。因此，人類大腦沒有適應於存儲和處理數字。但是，為了維持一個大王國，數學數據是必不可少的。立法和講述保護神的故事是不夠的。必須還要收稅。為了對數十萬人徵稅，必須收集有關人們收入和財產的數據，有關付款的數據，有關欠款、債務和罰款的數據，以及有關折扣和豁免的數據。這些數據合計達到數百萬個數據位，必須存儲和處理。如果沒有這種能力，國家就永遠不知道它擁有什么樣的資源和可以進一步利用什么樣的資源。當面臨需要記憶、回憶和處理所有這些數字的需要時，大多數人類大腦會意外過量或入睡。

This mental limitation severely constrained the size and complexity of human collectives. When the amount of people and property in a particular society crossed a critical threshold, it became necessary to store and process large amounts of mathematical data. Since the human brain could not do it, the system collapsed. For thousands of years after the Agricultural Revolution, human social networks remained relatively small and simple.

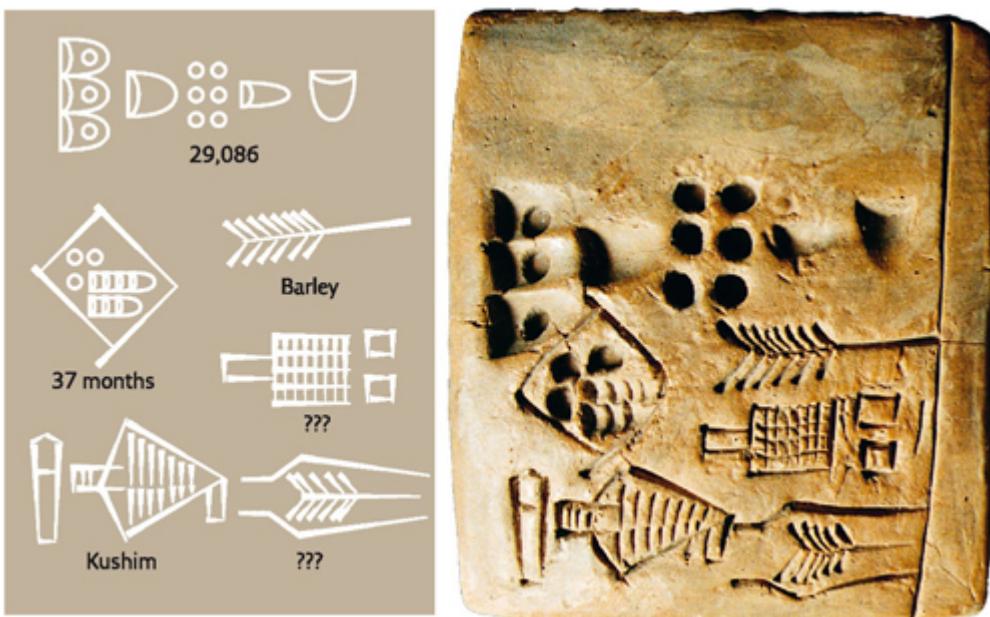
The first to overcome the problem were the ancient Sumerians, who lived in southern Mesopotamia. There, a scorching sun beating upon rich muddy plains produced plentiful harvests and prosperous towns. As the number of inhabitants grew, so did the amount of information required to coordinate their affairs. Between the years 3500 BC and 3000 BC, some unknown Sumerian geniuses invented a system for storing and processing information outside their brains, one that was custom-built to handle large amounts of mathematical data. The Sumerians thereby released their social order from the limitations of the human brain, opening the way for the appearance of cities, kingdoms and empires. The data-processing system invented by the Sumerians is called 'writing'.

這種心理限制嚴重地制約了人類集體的規模和複雜度。當一個特定社會中的人口和財產穿過一個臨界點時，就需要儲存和處理大量數據。由於人腦無法做到這一點，系統就會崩潰。在農業革命之後的數千年中，人類社交網絡仍然相對較小和簡單。第一個克服這個問題的是生活在美索不達米亞南部的古蘇美爾人。在那裡，炙熱的陽光照耀著肥沃的泥濘平原，產生了豐富的收成和繁榮的城鎮。隨著居民數量的增加，協調他們事務所需的信息量也隨之增長。在公元前3500年至公元前3000年之間，一些不知名的蘇美爾天才發明了一個系統，用於存儲和處理腦部外的信息，該系統特別適合處理大量的數據。這樣，蘇美爾人就從人類大腦的限制中解放了他們的社會秩序，為城市、王國和帝國的出現打開了道路。蘇美爾人發明的數據處理系統稱為“書寫”。

Signed, Kushim

Writing is a method for storing information through material signs. The Sumerian writing system did so by combining two types of signs, which were pressed in clay tablets. One type of signs represented numbers. There were signs for 1, 10, 60, 600, 3,600 and 36,000. (The Sumerians used a combination of base-6 and base-10 numeral systems. Their base-6 system bestowed on us several important legacies, such as the division of the day into twenty-four hours and of the circle into 360 degrees.) The other type of signs represented people, animals, merchandise, territories, dates and so forth. By combining both types of signs the Sumerians were able to preserve

far more data than any human brain could remember or any DNA chain could encode.



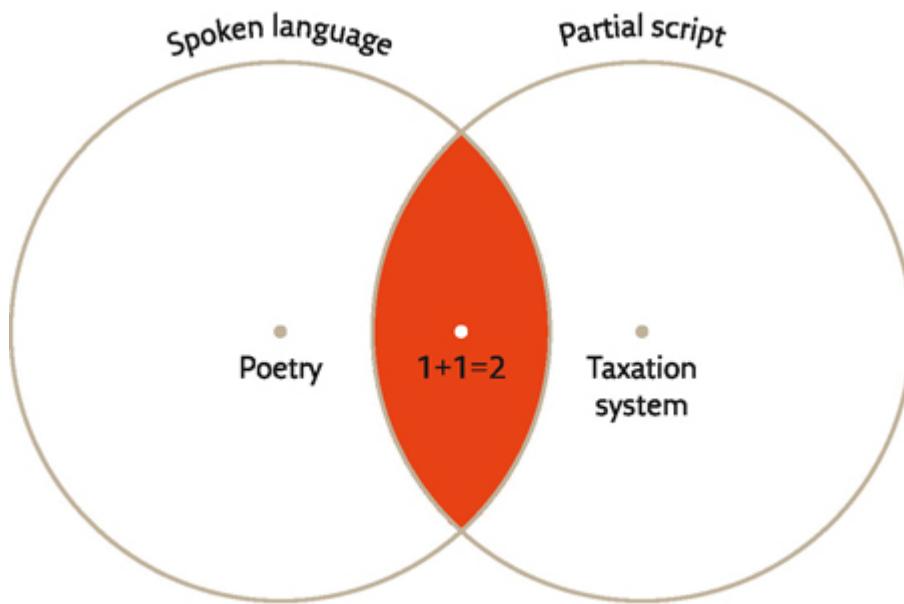
19. A clay tablet with an administrative text from the city of Uruk , c .3400–3000 BC . ‘Kushim’ may be the generic title of an officeholder, or the name of a particular individual. If Kushim was indeed a person, he may be the first individual in history whose name is known to us! All the names applied earlier in human history – the Neanderthals, the Natufians, Chauvet Cave, Göbekli Tepe – are modern inventions. We have no idea what the builders of Göbekli Tepe actually called the place. With the appearance of writing, we are beginning to hear history through the ears of its protagonists. When Kushim’s neighbours called out to him, they might really have shouted ‘Kushim!’ It is telling that the first recorded name in history belongs to an accountant, rather than a prophet, a poet or a great conqueror. ¹

書寫是通過物質符號儲存信息的一種方法。蘇美爾文字系統通過結合兩種類型的符號，在粘土板上進行壓印。一類符號表示數字。有1、10、60、600、3,600和36,000等符號。（蘇美爾人使用基於6進位和10進位的數字系統的組合。他們的基於6進位的系統贈予了我們幾個重要的傳承，例如將一天分為24小時，以及將圓劃分為360度。）另一類符號表示人、動物、商品、領土、日期等等。通過結合兩種類型的符

號，蘇美爾人能夠保存比任何人類大腦可以記住或任何DNA鏈可以編碼的更多數據。19. 烏魯克城的一塊行政文本粘土板，約公元前3400年至3000年。「庫什姆」可能是一個官員的通用頭銜，或者是一個特定個體的名字。如果庫什姆確實是一個人，他可能是歷史上第一個我們知道名字的個體！早期人類歷史上使用的所有名稱——尼安德特人、納圖菲亞人、肖維特洞穴、哥貝克力·特普——都是現代的發明。我們不知道哥貝克力·特普的建造者實際上把它稱作什麼。隨著文明出現，我們開始聽到歷史的當事人們的話語。當庫什姆的鄰居呼喊他時，他們可能真的是喊著「庫什姆！」。令人感興趣的是，在歷史上記錄的第一個名字屬於一名會計師，而不是先知、詩人或偉大的征服者。

At this early stage, writing was limited to facts and figures. The great Sumerian novel, if there ever was one, was never committed to clay tablets. Writing was time-consuming and the reading public tiny, so no one saw any reason to use it for anything other than essential record-keeping. If we look for the first words of wisdom reaching us from our ancestors, 5,000 years ago, we're in for a big disappointment. The earliest messages our ancestors have left us read, for example, '29,086 measures barley 37 months Kushim.' The most probable reading of this sentence is: 'A total of 29,086 measures of barley were received over the course of 37 months. Signed, Kushim.' Alas, the first texts of history contain no philosophical insights, no poetry, legends, laws, or even royal triumphs. They are humdrum economic documents, recording the payment of taxes, the accumulation of debts and the ownership of property.

在這個早期階段，文字僅限於事實和數字。偉大的蘇美人小說，如果曾經有的話，從未被寫在粘土板上。寫作費時耗力，閱讀人口微小，因此沒有人認為有必要將它用於除了基本的記錄以外的任何事情。如果我們尋找來自我們祖先的第一個智慧話語，那麼5000年前的我們將大失所望。我們祖先留下的最早信息，例如“庫什姆37個月 29,086斤大麥”，最可能的解讀是：“在37個月的時間裡總共收到了29,086斤大麥。簽名，庫什姆。”不幸的是，歷史上第一批文本並沒有包含哲學見解，詩歌，傳說，法律，甚至是皇家勝利。它們是枯燥乏味的經濟文件，記錄了納稅，債務的積累和財產的擁有權。



Partial script cannot express the entire spectrum of a spoken language, but it can express things that fall outside the scope of spoken language. Partial scripts such as the Sumerian and mathematical scripts cannot be used to write poetry, but they can keep tax accounts very effectively .

Only one other type of text survived from these ancient days, and it is even less exciting: lists of words, copied over and over again by apprentice scribes as training exercises. Even had a bored student wanted to write out some of his poems instead of copy a bill of sale, he could not have done so. The earliest Sumerian writing was a partial rather than a full script. Full script is a system of material signs that can represent spoken language more or less completely. It can therefore express everything people can say, including poetry. Partial script, on the other hand, is a system of material signs that can represent only particular types of information, belonging to a limited field of activity. Latin script, ancient Egyptian hieroglyphics and Braille are full scripts. You can use them to write tax registers, love poems, history books, food recipes and business law. In contrast, the earliest Sumerian script, like modern mathematical symbols and musical notation, are partial scripts. You can use mathematical script to make calculations, but you cannot use it to write love poems.

部分手稿不能完整地表達口語語言的光譜，但它可以表達超出口語語言範圍的事物。如蘇美爾文和數學手稿這樣的部分手稿不能用來寫

詩，但它們可以非常有效地記錄稅務。在古代，僅有另一種文字存世，而這種文字甚至更加乏味：單詞列表，由學徒抄寫訓練而來。即使無聊的學生想寫一些詩而不是抄一張發票，他也無法這樣做。最早的蘇美爾文字是部分而不是全文本。全文本是一種可以或多或少完整地代表口語語言的材料符號系統。因此，它可以表達人們可以說的一切，包括詩歌。另一方面，部分手稿是一種可以表示只屬於有限活動領域的特定類型的信息的材料符號系統。拉丁文手寫，古埃及象形文字和盲文是全文本。您可以使用它們來撰寫稅務登記、情詩、歷史書籍、食譜和商法。相比之下，最早的蘇美爾手稿，就像現代數學符號和樂譜一樣，是部分手稿。您可以使用數學手稿進行計算，但不能使用它來寫情詩。



20. A man holding a quipu, as depicted in a Spanish manuscript following the fall of the Inca Empire .

It didn't disturb the Sumerians that their script was ill-suited for writing poetry. They didn't invent it in order to copy spoken language, but rather to

do things that spoken language failed at. There were some cultures, such as those of the pre-Columbian Andes, which used only partial scripts throughout their entire histories, unfazed by their scripts' limitations and feeling no need for a full version. Andean script was very different from its Sumerian counterpart. In fact, it was so different that many people would argue it wasn't a script at all. It was not written on clay tablets or pieces of paper. Rather, it was written by tying knots on colourful cords called quipus. Each quipu consisted of many cords of different colours, made of wool or cotton. On each cord, several knots were tied in different places. A single quipu could contain hundreds of cords and thousands of knots. By combining different knots on different cords with different colours, it was possible to record large amounts of mathematical data relating to, for example, tax collection and property ownership. ²

20. 一個持有quipu的男子，在西班牙手稿中描繪自印加帝國滅亡後。蘇美人不會因為他們的書寫能力不適合用來寫詩而感到困擾。他們發明書寫是為了做一些口語語言無法完成的事情，而不是為了複製口語語言。有些文化，例如前哥倫比亞安第斯文明，在他們的整個歷史中只使用了部分書寫系統，對其限制不感興趣，並且不需要完整的版本。安第斯書寫與蘇美爾書寫非常不同。實際上，它是如此不同，以至於許多人認為並不算是一種書寫系統。它不是用粘土板或紙片書寫的。相反，它是通過在彩色繩索（稱為quipus）上打結來書寫的。每個quipu由許多不同顏色的繩索組成，由羊毛或棉製成。在每條繩索上，不同位置上綁有幾個結。一個quipu可以包含數百條繩索和數千個結。通過結合不同顏色的不同繩索上的不同結，可以記錄大量與稅收和財產所有權等數學數據相關的信息。2

For hundreds, perhaps thousands of years, quipus were essential to the business of cities, kingdoms and empires. ³ They reached their full potential under the Inca Empire, which ruled 10–12 million people and covered today's Peru, Ecuador and Bolivia, as well as chunks of Chile, Argentina and Colombia. Thanks to quipus, the Incas could save and process large amounts of data, without which they would not have been able to maintain the complex administrative machinery that an empire of that size requires.

In fact, quipus were so effective and accurate that in the early years following the Spanish conquest of South America, the Spaniards themselves

employed quipus in the work of administering their new empire. The problem was that the Spaniards did not themselves know how to record and read quipus, making them dependent on local professionals. The continent's new rulers realised that this placed them in a tenuous position – the native quipu experts could easily mislead and cheat their overlords. So once Spain's dominion was more firmly established, quipus were phased out and the new empire's records were kept entirely in Latin script and numerals. Very few quipus survived the Spanish occupation, and most of those remaining are undecipherable, since, unfortunately, the art of reading quipus has been lost.

數百年、甚至上千年來，奎普被視為城市、王國和帝國不可或缺的工具。安第斯山脈上的印加帝國統治著1000萬到1200萬人口，包括今天的祕魯、厄瓜多和玻利維亞，以及智利、阿根廷和哥倫比亞的部分地區，而奎普在印加帝國時期發揮了最大的潛力。有了奎普，印加人可以保存和處理大量的數據，沒有這些數據，他們就無法維護一個如此龐大的帝國所需的複雜行政機器。事實上，奎普是如此有效和準確，以至於在南美洲西班牙征服後的早期年份，西班牙人自己也使用奎普來管理他們新的帝國。問題是西班牙人自己不知道如何記錄和閱讀奎普，使他們依賴於當地專業人員。這些新統治者意識到這使他們處於不穩定的位置——本土的奎普專家可以輕易地欺騙並欺詐他們的統治者。因此，一旦西班牙的統治更加穩定，奎普便被淘汰了，新帝國的記錄完全以拉丁文腳本和數字來記錄。很少有奎普在西班牙占領時期生存下來，而大多數剩下的奎普無法解讀，因為不幸的是，閱讀奎普的技藝已經失傳了。

The Wonders of Bureaucracy

The Mesopotamians eventually started to want to write down things other than monotonous mathematical data. Between 3000 BC and 2500 BC more and more signs were added to the Sumerian system, gradually transforming it into a full script that we today call cuneiform. By 2500 BC, kings were using cuneiform to issue decrees, priests were using it to record oracles, and less exalted citizens were using it to write personal letters. At roughly the same time, Egyptians developed another full script known as hieroglyphics. Other

full scripts were developed in China around 1200 BC and in Central America around 1000–500 BC .

From these initial centres, full scripts spread far and wide, taking on various new forms and novel tasks. People began to write poetry, history books, romances, dramas, prophecies and cookbooks. Yet writing's most important task continued to be the storage of reams of mathematical data, and that task remained the prerogative of partial script. The Hebrew Bible, the Greek *Iliad*, the Hindu Mahabharata and the Buddhist Tipitika all began as oral works. For many generations they were transmitted orally and would have lived on even had writing never been invented. But tax registries and complex bureaucracies were born together with partial script, and the two remain inexorably linked to this day like Siamese twins – think of the cryptic entries in computerised data bases and spreadsheets.

美索不達米亞人最終開始想寫下除了單調的數學數據之外的東西。在公元前3000年至公元前2500年之間，越來越多的符號被添加到蘇美人的系統中，逐漸轉化為我們今天所稱的楔形文字全文本。到了公元前2500年，國王們開始使用楔形文字發布命令，祭司們用它來記錄預言，而不那麼尊貴的公民則用它來寫個人信件。大約在同一時間，埃及人發展出另一個全文本本，稱為象形文字。在公元前1200年左右，中國發展出其他的全文本本，中美洲也發展出了全文本本，時間為公元前1000-500年。從這些最初的中心開始，全文本本遠播，承擔著各種新形式和新任務。人們開始寫詩歌、歷史書籍、浪漫小說、戲劇、預言和食譜。然而，寫作最重要的任務仍然是儲存大量的數學數據，而這個任務仍然是部分腳本的特權。希伯來聖經、希臘《伊利亞特》、印度《馬哈巴拉塔》和佛教《三藏》等作品最初是口頭作品。他們在多代人之間口耳相傳，即使沒有文字也會繼續流傳下去。但是稅收登記和復雜的官僚體系伴隨著部分腳本誕生，在現今仍然不可避免地相互聯繫，就像連體嬰一樣-想想計算機數據庫和電子表格中的神秘條目。

As more and more things were written, and particularly as administrative archives grew to huge proportions, new problems appeared. Information stored in a person's brain is easy to retrieve. My brain stores billions of bits of data, yet I can quickly, almost instantaneously, recall the name of Italy's capital, immediately afterwards recollect what I did on 11 September 2001,

and then reconstruct the route leading from my house to the Hebrew University in Jerusalem. Exactly how the brain does it remains a mystery, but we all know that the brain's retrieval system is amazingly efficient, except when you are trying to remember where you put your car keys.

How, though, do you find and retrieve information stored on quipu cords or clay tablets? If you have just ten tablets or a hundred tablets, it's not a problem. But what if you have accumulated thousands of them, as did one of Hammurabi's contemporaries, King Zimrilim of Mari?

隨著越來越多的事物被書寫下來，特別是當行政檔案變得十分龐大時，新的問題也隨之出現。存儲在人腦中的信息很容易檢索。我的大腦存儲了數十億位元組的數據，但我可以迅速，幾乎即刻地記起義大利首都的名字，然後回憶起我在2001年9月11日所做的事情，接著就能重構從我家到耶路撒冷希伯來大學的路線。大腦如何實現這一點仍然是一個謎，但我們都知道，大腦的檢索系統非常高效，除了當你試圖記住你放車鑰匙的地方時。然而，你如何找到和檢索存儲在織帶或黏土錠片上的信息呢？如果你只有十塊或一百塊錠片，這不是問題。但如果你像漢穆拉比的同代人瑪利國王Zimrilim一樣積累了數千塊錠片，該怎麼辦？

Imagine for a moment that it's 1776 BC. Two Marians are quarrelling over possession of a wheat field. Jacob insists that he bought the field from Esau thirty years ago. Esau retorts that he in fact rented the field to Jacob for a term of thirty years, and that now, the term being up, he intends to reclaim it. They shout and wrangle and start pushing one another before they realise that they can resolve their dispute by going to the royal archive, where are housed the deeds and bills of sale that apply to all the kingdom's real estate. Upon arriving at the archive they are shuttled from one official to the other. They wait through several herbal tea breaks, are told to come back tomorrow, and eventually are taken by a grumbling clerk to look for the relevant clay tablet. The clerk opens a door and leads them into a huge room lined, floor to ceiling, with thousands of clay tablets. No wonder the clerk is sour-faced. How is he supposed to locate the deed to the disputed wheat field written thirty years ago? Even if he finds it, how will he be able to cross-check to ensure that the one from thirty years ago is the latest document relating to the field in question? If he can't find it, does that prove that Esau never sold or

rented out the field? Or just that the document got lost, or turned to mush when some rain leaked into the archive?

想像一下，現在是公元前 1776 年。兩個瑪利亞人正在為一塊小麥田的擁有權爭吵。雅各堅稱他在 30 年前從以撒那裡買下這塊田地。以撒則反駁說，事實上他是把這塊田地租給雅各使用了 30 年，現在租期結束，他打算重新收回來。他們吵鬧著，推搡著，直到意識到他們可以通過去皇家檔案館解決他們的爭端。在抵達檔案館後，他們被接連轉交給不同的官員。他們等待了好幾個茶歇，被告知明天再來，最終被一位不悅的職員帶著去找相關的泥板。職員打開一扇門，帶領他們進入一個巨大的房間，裡面從地板到天花板都排滿了成千上萬的泥板。難怪職員臉色陰沉。他該如何找到寫於 30 年前的爭議小麥田地契呢？即使他找到了，他如何確認從 30 年前開始的那個文件是否是涉及該田地的最新文件？如果他找不到，這是否證明以撒從未出售或出租該田地？還是只是文件丟失了，或者因為某場雨漏進檔案館而變成泥漿了？

Clearly, just imprinting a document in clay is not enough to guarantee efficient, accurate and convenient data processing. That requires methods of organisation like catalogues, methods of reproduction like photocopy machines, methods of rapid and accurate retrieval like computer algorithms, and pedantic (but hopefully cheerful) librarians who know how to use these tools.

Inventing such methods proved to be far more difficult than inventing writing. Many writing systems developed independently in cultures distant in time and place from each other. Every decade archaeologists discover another few forgotten scripts. Some of them might prove to be even older than the Sumerian scratches in clay. But most of them remain curiosities because those who invented them failed to invent efficient ways of cataloguing and retrieving data. What set apart Sumer, as well as pharaonic Egypt, ancient China and the Inca Empire, is that these cultures developed good techniques of archiving, cataloguing and retrieving written records. They also invested in schools for scribes, clerks, librarians and accountants.

顯然，僅僅在黏土上刻印文件並不能保證有效、準確和便捷的數據處理。這需要組織方法，如目錄；再製方法，如影印機；以及快速準確

檢索方法，如計算機算法，以及精細（但希望是愉快的）的圖書館員，他們知道如何使用這些工具。發明這樣的方法比發明寫作要困難得多。許多書寫系統在獨立的、遠離彼此的文化中發展出來。每個十年，考古學家就會發現另外幾個被遺忘的文字。它們中的一些可能會被證明比蘇美人在黏土上刮的符號還要古老。但大多數被視為奇聞異事，因為發明它們的人沒有發明高效的目錄和數據檢索方式。蘇美、古埃及、古中國和印加帝國之所以獨具匠心，是因為這些文化發展出了良好的檔案管理、目錄編製和檢索書面記錄的技術。他們還投資於為書記、職員、圖書館員和會計師設立學校。

A writing exercise from a school in ancient Mesopotamia discovered by modern archaeologists gives us a glimpse into the lives of these students, some 4,000 years ago:

I went in and sat down, and my teacher read my tablet. He said, ‘There’s something missing!’

And he caned me.

One of the people in charge said, ‘Why did you open your mouth without my permission?’

And he caned me.

The one in charge of rules said, ‘Why did you get up without my permission?’

And he caned me.

The gatekeeper said, ‘Why are you going out without my permission?’ And he caned me.

The keeper of the beer jug said, ‘Why did you get some without my permission?’

And he caned me.

The Sumerian teacher said, ‘Why did you speak Akkadian?’ ^{*}[—](#)

And he caned me.

My teacher said, ‘Your handwriting is no good!’

一份古代美索不達米亞學校的寫作練習在現代考古學家的發現下讓我們得以一窺4000年前這些學生的生活：我進去輕聲坐下，我的老師讀了我的碑文。他說，“有什麼缺失的！”於是用藤條打了我。負責人之一說，‘為什麼你未經我的許可就開口說話？’於是用藤條打了我。負責規則的人說，“為什麼你未經我的許可就站起來了？”於是用藤條打了我。看門人說，“為什麼你未經我的許可就出去了？”於是用藤條打了我。看啤酒壇的人說，“為什麼你未經我的許可就拿了一些？”於是用藤條打了我。蘇美人老師說，“為什麼你說阿卡德話？”然後用藤條打了我。我的老師說，“你的手寫得不好！”

And he caned me.⁴

Ancient scribes learned not merely to read and write, but also to use catalogues, dictionaries, calendars, forms and tables. They studied and internalised techniques of cataloguing, retrieving and processing information very different from those used by the brain. In the brain, all data is freely associated. When I go with my spouse to sign on a mortgage for our new home, I am reminded of the first place we lived together, which reminds me of our honeymoon in New Orleans, which reminds me of alligators, which remind me of dragons, which remind me of *The Ring of the Nibelungen*, and suddenly, before I know it, there I am humming the Siegfried leitmotif to a puzzled bank clerk. In bureaucracy, things must be kept apart. There is one drawer for home mortgages, another for marriage certificates, a third for tax registers, and a fourth for lawsuits. Otherwise, how can you find anything? Things that belong in more than one drawer, like Wagnerian music dramas (do I file them under ‘music’, ‘theatre’, or perhaps invent a new category altogether?), are a terrible headache. So one is forever adding, deleting and rearranging drawers.

他打了我。古代的抄寫員不僅學會閱讀和寫作，還學習使用目錄、詞典、日曆、表格等。他們研究並內化了目錄、檢索和處理信息的技巧，這些技巧與大腦所使用的技巧非常不同。在大腦中，所有的數據都是自由聯想的。當我和配偶一起簽署我們新家的抵押貸款時，我想

起了我們一起生活的第一個地方，這讓我想起了我們在新奧爾良的蜜月旅行，這讓我想起了鱷魚，這讓我想起了龍，這讓我想起了《尼伯龍根的指環》，然後，在我還沒有意識到之前，我就對一個困惑的銀行職員哼唱起《齊格弗里德》的主題曲來。在官僚體制中，事情必須保持分離。有一個抽屜是用來放家庭抵押貸款的，另一個是用來放婚姻證書的，第三個是用來放稅收登記的，第四個是用來放訴訟的。否則，你怎麼能找到任何東西呢？屬於多個抽屜的物品，比如瓦格納的音樂劇（我應該將它們歸檔在“音樂”、“劇院”還是發明一個全新的類別？），將會是一個可怕的頭痛。因此，人們總是不斷地添加、刪除和重新排列抽屜。

In order to function, the people who operate such a system of drawers must be reprogrammed to stop thinking as humans and to start thinking as clerks and accountants. As everyone from ancient times till today knows, clerks and accountants think in a non-human fashion. They think like filing cabinets. This is not their fault. If they don't think that way their drawers will all get mixed up and they won't be able to provide the services their government, company or organisation requires. The most important impact of script on human history is precisely this: it has gradually changed the way humans think and view the world. Free association and holistic thought have given way to compartmentalisation and bureaucracy.

The Language of Numbers

As the centuries passed, bureaucratic methods of data processing grew ever more different from the way humans naturally think – and ever more important. A critical step was made sometime before the ninth century AD, when a new partial script was invented, one that could store and process mathematical data with unprecedented efficiency. This partial script was composed of ten signs, representing the numbers from 0 to 9. Confusingly, these signs are known as Arabic numerals even though they were first invented by the Hindus (even more confusingly, modern Arabs use a set of digits that look quite different from Western ones). But the Arabs get the credit because when they invaded India they encountered the system, understood its usefulness, refined it, and spread it through the Middle East and then to Europe. When several other signs were later added to the Arab

numerals (such as the signs for addition, subtraction and multiplication), the basis of modern mathematical notation came into being.

為了使抽屜系統運作正常，操作該系統的人必須被重新設定，停止以人類為中心思考，轉而想像成書記和會計。自古至今，每個人都知道，書記和會計的思維方式與人類有所不同，他們像檔案櫃一樣思考。這不是他們的錯。如果他們不這麼想，他們的抽屜將亂七八糟，他們就無法提供政府、公司或組織所需的服務。文化的最重要影響是：它逐漸改變了人類思考和看待世界的方式。自由聯想和整體思維已經被局部化和官僚化所取代。隨著世紀的過去，官僚化的數據處理方法與人類自然思維的方式日益不同，也越來越重要。在公元九世紀之前的某個時候，發明了一種新的部分文字，可以以前所未有的效率存儲和處理數學數據。這個部分文字由十個符號組成，代表從 0 到 9 的數字。令人困惑的是，這些符號被稱為阿拉伯數字，即使它們最初是由印度人發明的（更令人困惑的是，現代阿拉伯人使用的數字集看起來與西方數字不太相同）。但是阿拉伯人贏得了掌聲，因為當他們入侵印度時，遇到了這個系統，了解了它的有用性，對其進行了改進，然後將其傳播到中東，再到歐洲。當其他一些符號稍後添加到阿拉伯數字中時（例如加法、減法和乘法符號），現代數學記號的基礎就建立起來了。

Although this system of writing remains a partial script, it has become the world's dominant language. Almost all states, companies, organisations and institutions – whether they speak Arabic, Hindi, English or Norwegian – use mathematical script to record and process data. Every piece of information that can be translated into mathematical script is stored, spread and processed with mind-boggling speed and efficiency.

A person who wishes to influence the decisions of governments, organisations and companies must therefore learn to speak in numbers. Experts do their best to translate even ideas such as 'poverty', 'happiness' and 'honesty' into numbers ('the poverty line', 'subjective well-being levels', 'credit rating'). Entire fields of knowledge, such as physics and engineering, have already lost almost all touch with the spoken human language, and are maintained solely by mathematical script.

雖然這種書寫系統是部份的，但它已成為全球佔優勢的語言。幾乎所有的國家、公司、組織和機構 - 無論他們講阿拉伯語、印地語、英語還是挪威語，都使用數學腳本來記錄和處理數據。可以被翻譯成數學腳本的每一條信息都以令人震驚的速度和效率儲存、傳播和處理。因此，想要影響政府、組織和公司決策的人必須學會說數字。專家們盡力把即使是“貧困”、“幸福”和“誠實”等概念轉化為數字（例如“貧窮線”、“主觀幸福水平”、“信用評級”）。整個領域的知識，例如物理學和工程學，已經幾乎完全與口語人類語言脫節，僅由數學腳本維護。

$$\begin{aligned}
 \ddot{\mathbf{r}}_i = & \sum_{j \neq i} \frac{\mu_j (\mathbf{r}_j - \mathbf{r}_i)}{r_{ij}^3} \left\{ 1 - \frac{2(\beta - \gamma)}{c^2} \sum_{l \neq i} \frac{\mu_l}{r_{il}} - \frac{2\beta - 1}{c^2} \sum_{k \neq j} \frac{\mu_k}{r_{jk}} + \gamma \left(\frac{s_i}{c} \right)^2 \right. \\
 & + (1 - \gamma) \left(\frac{s_j}{c} \right)^2 - \frac{2(1 + \gamma)}{c^2} \dot{\mathbf{r}}_i \cdot \dot{\mathbf{r}}_j - \frac{3}{2c^2} \left[\frac{(\mathbf{r}_i - \mathbf{r}_j) \cdot \mathbf{r}_j}{r_{ij}} \right]^2 \\
 & \left. + \frac{1}{2c^2} (\mathbf{r}_j - \mathbf{r}_i) \cdot \ddot{\mathbf{r}}_j \right\} \\
 & + \frac{1}{c^2} \sum_{j \neq i} \frac{\mu_i}{r_{ij}^3} \{ [\mathbf{r}_i - \mathbf{r}_j] \cdot [(2 + 2\gamma) \dot{\mathbf{r}}_i - (1 + 2\gamma) \dot{\mathbf{r}}_j] \} (\dot{\mathbf{r}}_i - \dot{\mathbf{r}}_j) \\
 & + \frac{3 + 4\gamma}{2c^2} \sum_{j \neq i} \frac{\mu_j \ddot{\mathbf{r}}_j}{r_{ij}}
 \end{aligned}$$

An equation for calculating the acceleration of mass i under the influence of gravity, according to the Theory of Relativity. When most laypeople see such an equation, they usually panic and freeze, like a deer caught in the headlights of a speeding vehicle. The reaction is quite natural, and does not betray a lack of intelligence or curiosity. With rare exceptions, human brains are simply incapable of thinking through concepts like relativity and quantum mechanics. Physicists nevertheless manage to do so, because they set aside the traditional human way of thinking, and learn to think anew with the help of external data-processing systems. Crucial parts of their thought process take place not in the head, but inside computers or on classroom blackboards .

More recently, mathematical script has given rise to an even more revolutionary writing system, a computerised binary script consisting of only two signs: 0 and 1. The words I am now typing on my keyboard are written within my computer by different combinations of 0 and 1.

根據相對論理論，計算質量受重力影響下的加速度方程式。當大多數普通人看到這樣的方程式時，通常會恐慌和凍結，就像一隻被速度車輛頭燈照到的鹿。這種反應非常自然，並不表示缺乏智慧或好奇心。除了少數例外，人類大腦根本無法思考相對論和量子力學等概念。物理學家仍然能夠這樣做，因為他們放棄了傳統的人類思維方式，學習利用外部數據處理系統重新思考。他們思考過程的重要部分不是在頭腦中進行，而是在計算機內部或教室的黑板上進行。最近，數學符號引發了一種更具革命性的書寫系統：一種由兩個符號0和1組成的電腦二進制文本系統。我現在在鍵盤上輸入的文字通過0和1的不同組合在我電腦內部寫入。

Writing was born as the maidservant of human consciousness, but is increasingly becoming its master. Our computers have trouble understanding how *Homo sapiens* talks, feels and dreams. So we are teaching *Homo sapiens* to talk, feel and dream in the language of numbers, which can be understood by computers.

And this is not the end of the story. The field of artificial intelligence is seeking to create a new kind of intelligence based solely on the binary script of computers. Science-fiction movies such as *The Matrix* and *The Terminator* tell of a day when the binary script throws off the yoke of humanity. When humans try to regain control of the rebellious script, it responds by attempting to wipe out the human race.

*Even after Akkadian became the spoken language, Sumerian remained the language of administration and thus the language recorded with writing. Aspiring scribes thus had to speak Sumerian.

寫作最初是人類意識的女傭，但逐漸成為其主人。我們的電腦有困難理解人類的說話、感覺和夢想。因此，我們正在教導人類用數字的語言來說話、感受和做夢，以便電腦能夠理解。這還不是故事的結束。人工智慧領域正在尋求創造一種純粹基於計算機二進位腳本的新智

慧。科幻電影《黑客帝國》和《終結者》講述了二進位腳本擺脫人類束縛的一天。當人類試圖重新控制叛逆的腳本時，它會試圖消滅人類。即使阿卡德語成為口語，蘇美語仍然是管理文書的語言，因此用於寫作的語言也是蘇美語。因此，有志於成為文士的人必須會講蘇美語。

There is No Justice in History

UNDERSTANDING HUMAN HISTORY IN THE millennia following the Agricultural Revolution boils down to a single question: how did humans organise themselves in mass-cooperation networks, when they lacked the biological instincts necessary to sustain such networks? The short answer is that humans created imagined orders and devised scripts. These two inventions filled the gaps left by our biological inheritance.

However, the appearance of these networks was, for many, a dubious blessing. The imagined orders sustaining these networks were neither neutral nor fair. They divided people into make-believe groups, arranged in a hierarchy. The upper levels enjoyed privileges and power, while the lower ones suffered from discrimination and oppression. Hammurabi's Code, for example, established a pecking order of superiors, commoners and slaves. Superiors got all the good things in life. Commoners got what was left. Slaves got a beating if they complained.

理解自農業革命之後的千禧年人類歷史，總歸於一個問題：當人類缺乏維持大規模合作網絡所需的生物本能時，他們如何組織自己進行協作？簡單地說，人類創造了想像秩序並構思了腳本。這兩種發明填補了我們生物遺傳所留下的差距。然而，對於許多人來說，這些網絡的出現並不是一種值得慶祝的福利。支撐這些網絡的想像秩序既不中立也不公正。它們將人們分為虛構的群體，排列在一種階級結構中。上層享有特權和權力，而下層遭受歧視和壓迫。例如，漢莫拉比法典建立了上級、平民和奴隸的等級制度。上級得到生活中的一切好東西，平民得到剩下的東西，而奴隸如果抱怨，就受到痛打。

Despite its proclamation of the equality of all men, the imagined order established by the Americans in 1776 also established a hierarchy. It created a hierarchy between men, who benefited from it, and women, whom it left

disempowered. It created a hierarchy between whites, who enjoyed liberty, and blacks and American Indians, who were considered humans of a lesser type and therefore did not share in the equal rights of men. Many of those who signed the Declaration of Independence were slaveholders. They did not release their slaves upon signing the Declaration, nor did they consider themselves hypocrites. In their view, the rights of *men* had little to do with Negroes.

The American order also consecrated the hierarchy between rich and poor. Most Americans at that time had little problem with the inequality caused by wealthy parents passing their money and businesses on to their children. In their view, equality meant simply that the same laws applied to rich and poor. It had nothing to do with unemployment benefits, integrated education or health insurance. Liberty, too, carried very different connotations than it does today. In 1776, it did not mean that the disempowered (certainly not blacks or Indians or, God forbid, women) could gain and exercise power. It meant simply that the state could not, except in unusual circumstances, confiscate a citizen's private property or tell him what to do with it. The American order thereby upheld the hierarchy of wealth, which some thought was mandated by God and others viewed as representing the immutable laws of nature. Nature, it was claimed, rewarded merit with wealth while penalising indolence.

除了宣示所有人的平等，美國在1776年建立的想像秩序還建立了一種階級制度。它創造了男性和女性之間的等級制度，讓男性受益，而讓女性失去權力。它建立了白人和黑人、美洲印地安人之間的等級制度，後者被認為是較低等的人，因此並未享有男性平等權利。許多簽署《獨立宣言》的人都是持有奴隸的人。他們在簽署《獨立宣言》後並未釋放他們的奴隸，也並未認為自己是虛偽的。在他們看來，人權與黑人無關。美國秩序還具體確立了富人和窮人之間的階級制度。當時，大多數美國人都對富裕家庭把錢和生意傳給下一代所導致的不平等沒有什麼問題。在他們看來，平等僅僅意味著同樣的法律適用於貧富。這與失業補助、一體化教育或健康保險無關。自由也有很不同的內涵，與今天不同。1776年，它並不意味著讓失去權力的人（當然不是黑人、印地安人或女性）能夠獲得和行使權力。這僅僅意味著國家在除非情況特殊，否則不能沒有正當理由地沒收公民的私人財產或告訴他該怎麼處理它。美國秩序因此維護了財富階層制度，一些人認為

這是上帝命令，另一些人則認為這代表了不變的自然法則。據聲稱，自然會通過財富獎勵功勞，懲罰懶惰。

All the above-mentioned distinctions – between free persons and slaves, between whites and blacks, between rich and poor – are rooted in fictions. (The hierarchy of men and women will be discussed later.) Yet it is an iron rule of history that every imagined hierarchy disavows its fictional origins and claims to be natural and inevitable. For instance, many people who have viewed the hierarchy of free persons and slaves as natural and correct have argued that slavery is not a human invention. Hammurabi saw it as ordained by the gods. Aristotle argued that slaves have a ‘slavish nature’ whereas free people have a ‘free nature’. Their status in society is merely a reflection of their innate nature.

Ask white supremacists about the racial hierarchy, and you are in for a pseudoscientific lecture concerning the biological differences between the races. You are likely to be told that there is something in Caucasian blood or genes that makes whites naturally more intelligent, moral and hardworking. Ask a diehard capitalist about the hierarchy of wealth, and you are likely to hear that it is the inevitable outcome of objective differences in abilities. The rich have more money, in this view, because they are more capable and diligent. No one should be bothered, then, if the wealthy get better health care, better education and better nutrition. The rich richly deserve every perk they enjoy.

所有上述的區分——自由人和奴隸、白人和黑人、富人和窮人——都根源於幻想。(男女之間的等級制度稍後將討論。)然而，歷史的鐵則是每個想象中的等級制度都會否認其虛構的起源，聲稱自己是自然而然的。例如，許多人認為自由人和奴隸的等級制度是自然且正確的，他們認為奴隸制度並非人類的發明。漢諾比認為奴隸制度是神的旨意。亞里士多德認為奴隸具有“奴性”，而自由人則具有“自由的天性”。在這種觀點下，他們在社會中的地位僅僅反映了他們的先天本性。詢問種族主義者有關種族等級制度，你會得到一個關於種族間生物學差異的偽科學演講。你可能會被告知，高加索人的血液或基因中有某種能使白人自然而然更聰明、更有道德和更勤奮的成分。如果你問一個不折不扣的資本主義者關於財富等級制度，你可能會聽到這是能力客觀差異的必然結果。在這種觀點下，富人有更多的錢，因為他

們更能幹更勤奮。那麼，如果富人獲得更好的醫療保健、更好的教育和更好的營養，沒有人應該感到困擾。富人理應獲得他們所享有的一切好處。



21. A sign on a South African beach from the period of apartheid, restricting its usage to whites' only. People with lighter skin colour are typically more in danger of sunburn than people with darker skin. Yet there was no biological logic behind the division of South African beaches. Beaches reserved for people with lighter skin were not characterised by lower levels of ultraviolet radiation .

Hindus who adhere to the caste system believe that cosmic forces have made one caste superior to another. According to a famous Hindu creation myth, the gods fashioned the world out of the body of a primeval being, the Purusa. The sun was created from the Purusa's eye, the moon from the Purusa's brain, the Brahmins (priests) from its mouth, the Kshatriyas (warriors) from its arms, the Vaishyas (peasants and merchants) from its thighs, and the Shudras (servants) from its legs. Accept this explanation and the sociopolitical differences between Brahmins and Shudras are as natural and eternal as the differences between the sun and the moon. ¹The ancient Chinese believed that when the goddess Nü Wa created humans from earth, she kneaded

aristocrats from fine yellow soil, whereas commoners were formed from brown mud.²

南非海灘上的標誌在種族隔離時期，將其使用限制在僅白人使用。淺膚色的人通常比較容易曬傷，而深膚色的人則較不容易曬傷。然而，在南非海灘的分裂中並沒有生物學上的邏輯。為淺色肌膚保留的海灘並沒有低紫外線輻射水平的特徵。遵循種姓制度的印度教徒相信，宇宙力量使一個種姓優於另一個種姓。根據著名的印度教創造神話，眾神從原始存在——普魯薩——的身體中塑造了這個世界。太陽是從普魯薩的眼中創造出來的，月亮是從普魯薩的大腦中創造出來的，婆羅門（牧師）從它的嘴中創造出來的，卡什特里亞（士兵）從它的手臂中創造出來的，懷沙（農民和商人）從他的大腿中創造出來的，舒德拉（僕人）則從它的腿中創造出來的。接受這一解釋，婆羅門和舒德拉之間的社會差異就像月亮和太陽之間的差異一樣自然而永恆。古代中國人相信，當女神女媧用泥土創造人類時，她從細黃土製造貴族，而平民則由褐色泥土形成。

Yet, to the best of our understanding, these hierarchies are all the product of human imagination. Brahmins and Shudras were not really created by the gods from different body parts of a primeval being. Instead, the distinction between the two castes was created by laws and norms invented by humans in northern India about 3,000 years ago. Contrary to Aristotle, there is no known biological difference between slaves and free people. Human laws and norms have turned some people into slaves and others into masters. Between blacks and whites there are some objective biological differences, such as skin colour and hair type, but there is no evidence that the differences extend to intelligence or morality.

Most people claim that their social hierarchy is natural and just, while those of other societies are based on false and ridiculous criteria. Modern Westerners are taught to scoff at the idea of racial hierarchy. They are shocked by laws prohibiting blacks to live in white neighbourhoods, or to study in white schools, or to be treated in white hospitals. But the hierarchy of rich and poor – which mandates that rich people live in separate and more luxurious neighbourhoods, study in separate and more prestigious schools, and receive medical treatment in separate and better-equipped facilities – seems perfectly sensible to many Americans and Europeans. Yet it's a proven

fact that most rich people are rich for the simple reason that they were born into a rich family, while most poor people will remain poor throughout their lives simply because they were born into a poor family.

然而，就我們的理解而言，這些等級制度都是人類想象的產物。婆羅門和舒德拉並不是真正由神創造而來，而是大約3000年前印度北部人們發明的法律和規範所建立的。與亞里士多德不同的是，奴隸和自由人之間沒有已知的生物學差異。人類法律和規範使一些人變成奴隸，另一些人成為主人。黑人和白人之間存在一些客觀的生物學差異，例如皮膚顏色和頭髮質地，但沒有證據表明這些差異會延伸到智力或道德上。大多數人聲稱他們的社會等級制度是自然而然的，而其他社會的等級制度則是基於虛假和荒謬的標準。現代西方人被教導嘲笑種族等級制度的想法。他們對禁止黑人居住在白人社區、在白人學校學習或在白人醫院接受治療的法律感到震驚。但是，貧富等級制度則要求富人居住在分離且更豪華的社區、就讀於分離且更負盛名的學校並在分離且設備更齊全的設施中接受醫療治療，對許多美國人和歐洲人來說似乎非常明智。然而，事實已證明，大部分富人之所以富有，僅僅是因為他們出生在一個富裕的家庭，而大多數窮人在其一生中都會貧困，僅僅是因為出生在貧困的家庭。

Unfortunately, complex human societies seem to require imagined hierarchies and unjust discrimination. Of course not all hierarchies are morally identical, and some societies suffered from more extreme types of discrimination than others, yet scholars know of no large society that has been able to dispense with discrimination altogether. Time and again people have created order in their societies by classifying the population into imagined categories, such as superiors, commoners and slaves; whites and blacks; patricians and plebeians; Brahmins and Shudras; or rich and poor. These categories have regulated relations between millions of humans by making some people legally, politically or socially superior to others.

Hierarchies serve an important function. They enable complete strangers to know how to treat one another without wasting the time and energy needed to become personally acquainted. In George Bernard Shaw's *Pygmalion*, Henry Higgins doesn't need to establish an intimate acquaintance with Eliza Doolittle in order to understand how he should relate to her. Just hearing her talk tells him that she is a member of the underclass with whom he can do as

he wishes – for example, using her as a pawn in his bet to pass off a flower girl as a duchess. A modern Eliza working at a florist's needs to know how much effort to put into selling roses and gladioli to the dozens of people who enter the shop each day. She can't make a detailed enquiry into the tastes and wallets of each individual. Instead, she uses social cues – the way the person is dressed, his or her age, and if she's not politically correct his skin colour. That is how she immediately distinguishes between the accounting-firm partner who's likely to place a large order for expensive roses, and a messenger boy who can only afford a bunch of daisies.

很不幸地，複雜的人類社會似乎需要虛構的等級制度和不公平的歧視。當然，並不是所有的階級制度都道德相同，一些社會所遭受的歧視類型比其他社會更嚴重，但是學者們都不清楚有哪個大型社會可以完全取消歧視。一次次地，人們通過將人口分類為虛構的類別，例如上級、平民和奴隸；白人和黑人；貴族和平民；婆羅門和舒德拉；或富人和窮人，來建立他們的社會秩序。這些類別通過使某些人在法律、政治或社會上優於其他人，來調節數百萬人之間的關係。等級制度具有重要功能。它們使完全陌生的人知道如何對待對方，而不必浪費時間和精力去進行個人認識。在喬治·伯納德·肖爾的《卡門的花店》中，亨利·希金斯不需要與伊麗莎·杜立德建立親密的關係，就能夠理解他應該如何與她相處。光是聽她說話，就能讓他知道她是下層階級的一員，可以隨意對待她——例如，在他的賭注中利用她，把一個花販假扮成公爵夫人。一個現代的在花店工作的伊麗莎需要知道要花多少努力去向每天進入花店的數十人銷售玫瑰和劍蘭。她無法對每個人的品味和錢包進行詳細的調查。而是利用社交線索——人的穿著方式、年齡，如果她不是政治上正確的話，他的膚色。這就是她如何立即區分會訂購昂貴玫瑰的會計師夥伴和只能負擔一束雛菊的信差男孩。

Of course, differences in natural abilities also play a role in the formation of social distinctions. But such diversities of aptitudes and character are usually mediated through imagined hierarchies. This happens in two important ways. First and foremost, most abilities have to be nurtured and developed. Even if somebody is born with a particular talent, that talent will usually remain latent if it is not fostered, honed and exercised. Not all people get the same chance to cultivate and refine their abilities. Whether or not they have such an opportunity will usually depend on their place within their society's

imagined hierarchy. Harry Potter is a good example. Removed from his distinguished wizard family and brought up by ignorant muggles, he arrives at Hogwarts without any experience in magic. It takes him seven books to gain a firm command of his powers and knowledge of his unique abilities.

當然，天生的能力差異也對社會差異的形成起到了一定作用。但這種才能和性格的多樣性通常通過想象中的等級來進行調解。這發生在兩種重要的方式中。首先，大多數能力必須被培育和發展。即使某人天生擁有特殊的才能，如果不加培養、磨練和鍛煉，這種才能通常會保持潛在狀態。並非所有人都有同樣的機會培養和完善自己的能力。他們是否有這樣的機會通常取決於他們在社會想象中的等級。哈利波特是一個很好的例子。他來自傑出的巫師家族，卻被無知的麻瓜撫養，他在霍格沃茨學校沒有任何魔法經驗。他花了七本書的時間才得以掌握自己的力量和了解自己獨特的才能。

Second, even if people belonging to different classes develop exactly the same abilities, they are unlikely to enjoy equal success because they will have to play the game by different rules. If, in British-ruled India, an Untouchable, a Brahmin, a Catholic Irishman and a Protestant Englishman had somehow developed exactly the same business acumen, they still would not have had the same chance of becoming rich. The economic game was rigged by legal restrictions and unofficial glass ceilings.

The Vicious Circle

All societies are based on imagined hierarchies, but not necessarily on the same hierarchies. What accounts for the differences? Why did traditional Indian society classify people according to caste, Ottoman society according to religion, and American society according to race? In most cases the hierarchy originated as the result of a set of accidental historical circumstances and was then perpetuated and refined over many generations as different groups developed vested interests in it.

其次，即使各階層的人擁有完全相同的能力，他們很可能也無法享受平等的成功，因為他們必須按照不同的規則來進行遊戲。即使在英國統治下的印度，一個賤民、一個婆羅門、一個愛爾蘭天主教徒和一個

英國新教徒在商業敏銳度方面表現完全相同，他們的致富機會仍然不同。經濟遊戲被法律限制和非正式的障礙所扭曲。所有社會都是基於假想的等級制度，但不一定是基於相同的等級制度。是什麼造成了這些差異？為什麼傳統印度社會按種姓、奧斯曼社會按宗教、美國社會按種族劃分？大多數情況下，等級制度源於偶然的歷史情況，然後隨著不同的群體對其產生利益而不斷地得以延續和完善。

For instance, many scholars surmise that the Hindu caste system took shape when Indo-Aryan people invaded the Indian subcontinent about 3,000 years ago, subjugating the local population. The invaders established a stratified society, in which they – of course – occupied the leading positions (priests and warriors), leaving the natives to live as servants and slaves. The invaders, who were few in number, feared losing their privileged status and unique identity. To forestall this danger, they divided the population into castes, each of which was required to pursue a specific occupation or perform a specific role in society. Each had different legal status, privileges and duties. Mixing of castes – social interaction, marriage, even the sharing of meals – was prohibited. And the distinctions were not just legal – they became an inherent part of religious mythology and practice.

例如，許多學者猜測，印度雅利安人約在3,000年前入侵印度次大陸時，印度教種姓制度就形成了，壓迫當地人口。入侵者建立了一個等級分明的社會，他們 - 當然 - 擔任領導職務（祭司和戰士），讓當地人作為僕人和奴隸生活。入侵者少數人人數，擔心失去特權和獨特身份。為了防止這種危險，他們將人口劃分為各種社會階層，每種階層都需要從事特定職業或在社會上扮演特定角色。每位個人具有不同的法律地位、特權和責任。不同階層之間的混雜 - 社交、婚姻甚至飲食共享 - 是被禁止的。這些區別不僅是法律上的 - 它們成為了宗教神話和實踐的固有部分。

The rulers argued that the caste system reflected an eternal cosmic reality rather than a chance historical development. Concepts of purity and impurity were essential elements in Hindu religion, and they were harnessed to buttress the social pyramid. Pious Hindus were taught that contact with members of a different caste could pollute not only them personally, but society as a whole, and should therefore be abhorred. Such ideas are hardly unique to Hindus. Throughout history, and in almost all societies, concepts of

pollution and purity have played a leading role in enforcing social and political divisions and have been exploited by numerous ruling classes to maintain their privileges. The fear of pollution is not a complete fabrication of priests and princes, however. It probably has its roots in biological survival mechanisms that make humans feel an instinctive revulsion towards potential disease carriers, such as sick persons and dead bodies. If you want to keep any human group isolated – women, Jews, Roma, gays, blacks – the best way to do it is convince everyone that these people are a source of pollution.

統治者們爭論種姓制度反映永恆的宇宙現實，而不是偶然的歷史發展。純潔和不潔的概念是印度教宗教的基本元素，並被用來支持社會金字塔。虔誠的印度教徒被教導，與不同種姓的成員接觸不僅可以使他們個人污染，而且還會影響整個社會，因此應該被譴視。這些想法並不是印度教徒獨有的。在歷史上，幾乎所有社會的污染和純潔概念在強制社會和政治分裂方面起著主要作用，並被眾多統治階級利用來維持其特權。然而，對污染的恐懼並不完全是牧師和王子的虛構。它可能植根於生物存活機制，在這種機制中人類對潛在的病菌媒介者（如病患和死者）產生本能的厭惡感。如果您想使任何人類群體孤立 - 女人、猶太人、吉普賽人、同性戀者、黑人 - 最好的方法是讓所有人相信這些人是污染源。

The Hindu caste system and its attendant laws of purity became deeply embedded in Indian culture. Long after the Indo-Aryan invasion was forgotten, Indians continued to believe in the caste system and to abhor the pollution caused by caste mixing. Castes were not immune to change. In fact, as time went by, large castes were divided into sub-castes. Eventually the original four castes turned into 3,000 different groupings called *jati* (literally ‘birth’). But this proliferation of castes did not change the basic principle of the system, according to which every person is born into a particular rank, and any infringement of its rules pollutes the person and society as a whole. A person's *jati* determines her profession, the food she can eat, her place of residence and her eligible marriage partners. Usually a person can marry only within his or her caste, and the resulting children inherit that status.

印度的印度教種姓制度及其相關的純淨法律深深地植入了印度文化。在印度-雅利安人入侵被遺忘後很長一段時間，印度人繼續相信種姓制

度和憎惡種姓混合所產生的污染。種姓不免於改變。事實上，隨著時間的推移，大型種姓被分成了亞種姓。最終，最初的四個種姓轉變成了被稱為“茨蒂”（字面意思是“出生”）的3,000種不同的群體。但是，這種種姓的增加並沒有改變基本原則，即每個人都出生在一個特定的等級，任何對其規則的侵犯都會污染個人和整個社會。人的茨蒂決定了她的職業、她可以吃的食品、她的居住地和她的合適婚姻伴侶。通常，一個人只能在他或她的茨蒂內結婚，而由此產生的孩子將繼承該地位。

Whenever a new profession developed or a new group of people appeared on the scene, they had to be recognised as a caste in order to receive a legitimate place within Hindu society. Groups that failed to win recognition as a caste were, literally, outcasts – in this stratified society, they did not even occupy the lowest rung. They became known as Untouchables. They had to live apart from all other people and scrape together a living in humiliating and disgusting ways, such as sifting through garbage dumps for scrap material. Even members of the lowest caste avoided mingling with them, eating with them, touching them and certainly marrying them. In modern India, matters of marriage and work are still heavily influenced by the caste system, despite all attempts by the democratic government of India to break down such distinctions and convince Hindus that there is nothing polluting in caste mixing.³

每當有新的職業出現或新的人群出現時，他們都必須被承認為種姓，才能在印度社會中獲得合法的地位。未能獲得種姓承認的群體，從字面上來說就是被排斥在外的人——在這個分層的社會裡，他們甚至沒有站立的地位。他們被稱為貧窮、卑微的難民。他們必須與其他人分開居住，並以羞辱和令人噁心的方式來維持生計，例如在垃圾堆中尋找拾荒物品。即使是最低種姓的成員也避免與他們交往，與他們共進餐飲，觸碰他們，更不用說結婚了。在現代的印度，婚姻和工作的問題仍然受到種姓制度的嚴重影響，儘管印度民主政府竭力打破種姓制的界限，並讓印度教徒相信，種姓的混合是沒有污染性的。

Purity in America

A similar vicious circle perpetuated the racial hierarchy in modern America. From the sixteenth to the eighteenth century, the European conquerors imported millions of African slaves to work the mines and plantations of America. They chose to import slaves from Africa rather than from Europe or East Asia due to three circumstantial factors. Firstly, Africa was closer, so it was cheaper to import slaves from Senegal than from Vietnam.

Secondly, in Africa there already existed a well-developed slave trade (exporting slaves mainly to the Middle East), whereas in Europe slavery was very rare. It was obviously far easier to buy slaves in an existing market than to create a new one from scratch.

Thirdly, and most importantly, American plantations in places such as Virginia, Haiti and Brazil were plagued by malaria and yellow fever, which had originated in Africa. Africans had acquired over the generations a partial genetic immunity to these diseases, whereas Europeans were totally defenceless and died in droves. It was consequently wiser for a plantation owner to invest his money in an African slave than in a European slave or indentured labourer. Paradoxically, genetic superiority (in terms of immunity) translated into social inferiority: precisely because Africans were fitter in tropical climates than Europeans, they ended up as the slaves of European masters! Due to these circumstantial factors, the burgeoning new societies of America were to be divided into a ruling caste of white Europeans and a subjugated caste of black Africans.

類似的惡性循環讓種族等級制度在現代美國持續存在。從16至18世紀，歐洲征服者引進了數百萬非洲奴隸到美洲的礦山和農場勞動。他們之所以選擇從非洲進口奴隸而不是歐洲或東亞，原因有三個狀況。首先，非洲更近，從塞內加爾進口奴隸比從越南便宜。其次，在非洲已經存在發達的奴隸貿易（主要出口到中東），而在歐洲奴隸非常罕見。顯然，在現有市場上買奴隸比從頭開始創建一個市場要容易得多。第三，最重要的是，像維吉尼亞、海地和巴西等地的美國農場深受瘧疾和黃熱病之苦，這些疾病源自非洲。隨著世代的推移，非洲人對這些疾病產生了部分的基因免疫力，而歐洲人完全無防禦力，死亡率很高。因此，一位農場主將資本投入非洲奴隸而不是歐洲奴隸或受契約工人。矛盾的是，基因優勢（在免疫方面）轉化為社會劣勢：正因為非洲人在熱帶氣候中比歐洲人更強健，所以他們最終成為了歐洲

主人的奴隸！由於這些狀況因素，新興社會的美洲被分成一個統治階層的白人歐洲人和一個被剝削的黑人非洲人階層。

But people don't like to say that they keep slaves of a certain race or origin simply because it's economically expedient. Like the Aryan conquerors of India, white Europeans in the Americas wanted to be seen not only as economically successful but also as pious, just and objective. Religious and scientific myths were pressed into service to justify this division.

Theologians argued that Africans descend from Ham, son of Noah, saddled by his father with a curse that his offspring would be slaves. Biologists argued that blacks are less intelligent than whites and their moral sense less developed. Doctors alleged that blacks live in filth and spread diseases – in other words, they are a source of pollution.

These myths struck a chord in American culture, and in Western culture generally. They continued to exert their influence long after the conditions that created slavery had disappeared. In the early nineteenth century imperial Britain outlawed slavery and stopped the Atlantic slave trade, and in the decades that followed slavery was gradually outlawed throughout the American continent. Notably, this was the first and only time in history that slaveholding societies voluntarily abolished slavery. But, even though the slaves were freed, the racist myths that justified slavery persisted.

Separation of the races was maintained by racist legislation and social custom.

然而，人們不喜歡承認他們只是因為經濟上的方便而奴役某種種族或來源的人。就像印度阿耳雅征服者一樣，生活在美洲的白人歐洲人不僅想被認為在經濟上成功，還想被認為是虔誠、公正和客觀。信仰和科學神話被用來證明這種劃分是合理的。神學家們認為非洲人是挪亞的兒子哈姆的後裔，是被他的父親詛咒成為奴隸的。生物學家則認為黑人智力低於白人，道德觸覺不發達。醫生們說黑人生活在骯髒之中，傳播疾病—換句話說，他們是一種污染源。這些神話在美國文化和西方文化一般都非常有影響。即使奴隸制度消失後，這些影響也持續存在。十九世紀初的大英帝國禁止奴隸制度，停止大西洋奴隸貿易，幾十年後，整個美洲的奴隸制度逐漸被禁止。值得注意的是，這是歷史上唯一一次奴役社會自願廢除奴隸制度。然而，即使奴隸得到

解放，為奴隸制度辯護的種族主義神話仍然存在。種族隔離被種族主義立法和社會習俗維持。

The result was a self-reinforcing cycle of cause and effect, a vicious circle. Consider, for example, the southern United States immediately after the Civil War. In 1865 the Thirteenth Amendment to the US Constitution outlawed slavery and the Fourteenth Amendment mandated that citizenship and the equal protection of the law could not be denied on the basis of race. However, two centuries of slavery meant that most black families were far poorer and far less educated than most white families. A black person born in Alabama in 1865 thus had much less chance of getting a good education and a well-paid job than did his white neighbours. His children, born in the 1880S and 1890s, started life with the same disadvantage – they, too, were born to an uneducated, poor family.

這個結果是一個自我強化的因果循環，一個惡性循環。例如，考慮在南部美國內戰後立即的情況。在1865年，美國憲法的第十三修正案禁止奴隸制度，而第十四修正案則規定不能因種族而否認公民權利和平等的法律保護。然而，兩個世紀的奴隸制度意味著大多數黑人家庭遠比大多數白人家庭貧困和缺乏教育。因此，在1865年在阿拉巴馬州出生的黑人比起白人鄰居，更難獲得良好的教育和高薪工作。他的孩子在1880年代和1890年代出生，也面臨著同樣的不利情況-他們同樣生於沒有教育和貧困家庭。

But economic disadvantage was not the whole story. Alabama was also home to many poor whites who lacked the opportunities available to their better-off racial brothers and sisters. In addition, the Industrial Revolution and the waves of immigration made the United States an extremely fluid society, where rags could quickly turn into riches. If money was all that mattered, the sharp divide between the races should soon have blurred, not least through intermarriage.

But that did not happen. By 1865 whites, as well as many blacks, took it to be a simple matter of fact that blacks were less intelligent, more violent and sexually dissolute, lazier and less concerned about personal cleanliness than whites. They were thus the agents of violence, theft, rape and disease – in other words, pollution. If a black Alabaman in 1895 miraculously managed

to get a good education and then applied for a respectable job such as a bank teller, his odds of being accepted were far worse than those of an equally qualified white candidate. The stigma that labelled blacks as, by nature, unreliable, lazy and less intelligent conspired against him.

經濟劣勢並不是全部原因。阿拉巴馬州也有許多貧窮的白人，缺乏與稍微富裕的種族兄弟姐妹可得的機會。此外，工業革命和移民浪潮使美國成為一個極其動態的社會，窮人可以很快變成富人。如果金錢是唯一重要的，那麼種族之間的明顯分野應該很快模糊，至少通過通婚。但這並沒有發生。到1865年，白人和許多黑人都認為，黑人比白人智力低下，更暴力和淫亂，懶惰，不重視個人清潔。因此，他們是暴力，偷竊，強奸和疾病（換句話說，污染）的代理人。如果一個黑人在1895年像個奇蹟一樣地接受了良好的教育，並申請了尊敬的工作，如銀行出納員，他成功的機會遠遠不如同樣有資格的白人候選人。標籤黑人為天生的不可靠，懶惰和智力低下的恥辱與他相互勾結。

You might think that people would gradually understand that these stigmas were myth rather than fact and that blacks would be able, over time, to prove themselves just as competent, law-abiding and clean as whites. In fact, the opposite happened – these prejudices became more and more entrenched as time went by. Since all the best jobs were held by whites, it became easier to believe that blacks really are inferior. ‘Look,’ said the average white citizen, ‘blacks have been free for generations, yet there are almost no black professors, lawyers, doctors or even bank tellers. Isn’t that proof that blacks are simply less intelligent and hard-working?’ Trapped in this vicious circle, blacks were not hired for white-collar jobs because they were deemed unintelligent, and the proof of their inferiority was the paucity of blacks in white-collar jobs.

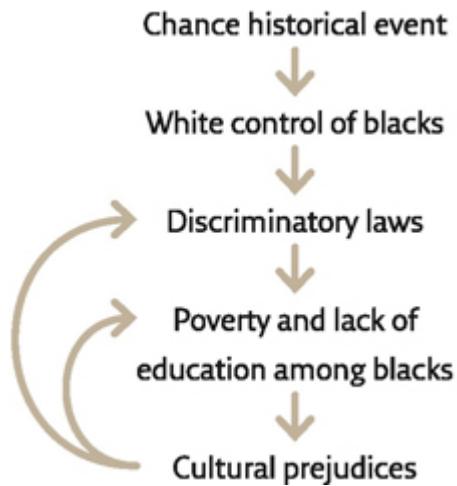
你可能认为人们在逐渐认识到这些污名不是事实而是谎言，黑人随着时间的推移，能够证明自己和白人一样有能力、守法和清洁。事实上，情况恰恰相反——随着时间的推移，这些偏见变得越来越根深蒂固。由于所有最好的工作都是由白人担任的，人们更容易相信黑人真的是劣等的。“看，”普通白人公民说，“黑人已经自由几代人了，可是几乎没有黑人教授、律师、医生，甚至是银行出纳员。这不是证明黑人简直没有白人聪明和勤奋吗？”陷入这种恶性循环中，黑人因为被认

为不聪明而没能得到白领工作，而黑人在白领工作中的稀缺又成了他们劣等性的证据。

The vicious circle did not stop there. As anti-black stigmas grew stronger, they were translated into a system of ‘Jim Crow’ laws and norms that were meant to safeguard the racial order. Blacks were forbidden to vote in elections, to study in white schools, to buy in white stores, to eat in white 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).

惡性循環並未就此停止。隨著反黑人偏見越來越強，它們被轉化為一套“吉姆·克勞”法律和規範，旨在維護種族秩序。黑人被禁止在選舉中投票、在白人學校學習、在白人商店購物、在白人餐廳就餐、在白人旅館住宿。所有這些的理由都是黑人髒亂懶惰且殘暴，因此需要保護白人免受威脅。白人不想跟黑人睡在同一家旅館或是在同一家餐廳吃東西，因為擔心會得病。他們不希望孩子和黑人孩子在同一所學校學習，擔心遭到殘暴和不良影響。他們不想讓黑人在選舉中投票，因為黑人無知且不道德。這些恐懼是由科學研究所證實，它們“證明”了黑人確實比其他人更沒受過教育、更易患各種疾病，以及犯罪率更高（研究忽略了這些“事實”是歧視黑人的結果）。

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.

到了二十世紀中葉，前南方邦的隔離可能比十九世紀末更嚴重。黑人學生克萊農·金於1958年申請密西西比大學，卻被強制送入精神病院。主審判定，一位黑人要認為他可以被錄取進密西西比大學，肯定是瘋了。這是一個惡性循環：一個偶然的歷史狀況被轉化為一個僵化的社會體制。對美國南方人（和許多北方人）而言，沒有什麼比黑人和白人女性之間的性關係和婚姻更令人厭惡的了。種族之間的性行為成為最大的禁忌，任何違反，或被懷疑違反，都會被視為應立即予以處罰，包括私刑。白人至上主義的秘密組織——三K黨（Ku Klux Klan）施行了許多此類殺害。他們可以教印度婆羅門教一些純淨法律。

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.

Such vicious circles can go on for centuries and even millennia, perpetuating an imagined hierarchy that sprang from a chance historical occurrence. Unjust discrimination often gets worse, not better, with time. Money comes to money, and poverty to poverty. Education comes to education, and ignorance to ignorance. Those once victimised by history are likely to be victimised yet again. And those whom history has privileged are more likely to be privileged again.

隨著時間的推移，種族主義蔓延到越來越多的文化領域。美國美學文化建立在白人的美學標準之上。白人種族的身體特徵 - 如淺色皮膚、公平的直髮和小巧翹鼻 - 被視為美麗的代表。典型的黑人特徵 - 黑皮膚、毛髮茂密和扁平的鼻子 - 被視為醜陋的代表。這些先入為主的印象在人類意識的更深層次上根深蒂固地鞏固了想像中的等級制度。這樣的惡性循環可以持續數世紀甚至數千年，延續著一個因偶然的歷史事件產生的等級制度。不公正的歧視往往會隨著時間而變得更加嚴重，財富得到財富，貧困得到貧困，教育得到教育，無知得到無知。那些曾在歷史上受到壓迫的人可能會再次受到壓迫。而那些歷史上得到優待的人更有可能再次受到優待。

Most sociopolitical hierarchies lack a logical or biological basis – they are nothing but the perpetuation of chance events supported by myths. That is one good reason to study history. If the division into blacks and whites or Brahmins and Shudras was grounded in biological realities – that is, if Brahmins really had better brains than Shudras – biology would be sufficient for understanding human society. Since the biological distinctions between different groups of *Homo sapiens* are, in fact, negligible, biology can't explain the intricacies of Indian society or American racial dynamics. We can only understand those phenomena by studying the events, circumstances, and power relations that transformed figments of imagination into cruel – and very real – social structures.

大部分的社會政治體系缺乏邏輯或生物基礎，它們不過是由神話支撐下的偶然事件的延續。這就是研究歷史的一個很好的理由。如果將人分成黑人和白人或婆羅門和舒德拉斯的區別是基於生物現實的-也就是

說如果婆羅門真的比舒德拉斯聰明，那麼生物學就足以理解人類社會。由於不同種族的人類之間的生物學區別實際上是微不足道的，因此生物學不能解釋印度社會或美國種族動態的細節。我們只能通過研究將想象中的事物轉化為殘酷而非常現實的社會結構的事件、情況和權力關係來理解這些現象。

He and She

Different societies adopt different kinds of imagined hierarchies. Race is very important to modern Americans but was relatively insignificant to medieval Muslims. Caste was a matter of life and death in medieval India, whereas in modern Europe it is practically non-existent. One hierarchy, however, has been of supreme importance in all known human societies: the hierarchy of gender. People everywhere have divided themselves into men and women. And almost everywhere men have got the better deal, at least since the Agricultural Revolution.

Some of the earliest Chinese texts are oracle bones, dating to 1200 BC, used to divine the future. On one was engraved the question: ‘Will Lady Hao’s childbearing be lucky?’ To which was written the reply: ‘If the child is born on a *ding* day, lucky; if on a *geng* day, vastly auspicious.’ However, Lady Hao was to give birth on a *jiayin* day. The text ends with the morose observation: ‘Three weeks and one day later, on *jiayin* day, the child was born. Not lucky. It was a girl.’⁴ More than 3,000 years later, when Communist China enacted the ‘one child’ policy, many Chinese families continued to regard the birth of a girl as a misfortune. Parents would occasionally abandon or murder newborn baby girls in order to have another shot at getting a boy.

不同的社會採用不同的想像等級制度。種族對於現代美國人非常重要，但對於中世紀的穆斯林相對不重要。種姓制度在中世紀印度是生死攸關的問題，然而在現代的歐洲則幾乎不存在。然而，一個等級結構在所有已知的人類社會中都至關重要：性別等級。人們無論在哪裡都將自己分成男性和女性。而且幾乎在所有地方，男性都獲得了更好的待遇，至少自從農業革命以來如此。一些最早的中國文獻是殷墟甲骨，可以追溯到公元前1200年，用於卜卦。其中一個問題寫上：“郝夫

人生育是幸運的嗎？”回答是：“如果孩子在丁日出生，很幸運；如果在庚日出生，非常吉祥。”然而，郝夫人將在甲寅日生育。該文獻以沮喪的觀察結尾：“三個星期零一天後，在甲寅日，孩子出生了。不幸的是，是個女孩。”超過3,000年後，當中國共產黨實行“一孩政策”時，許多中國家庭仍然把女孩的出生視為厄運。父母有時會遺棄或殺害新生嬰兒女孩，以便有機會再生育一個男孩。

In many societies women were simply the property of men, most often their fathers, husbands or brothers. Rape, in many legal systems, falls under property violation – in other words, the victim is not the woman who was raped but the male who owns her. This being the case, the legal remedy was the transfer of ownership – the rapist was required to pay a bride price to the woman's father or brother, upon which she became the rapist's property. The Bible decrees that 'If a man meets a virgin who is not betrothed, and seizes her and lies with her, and they are found, then the man who lay with her shall give to the father of the young woman fifty shekels of silver, and she shall be his wife' (Deuteronomy 22:28–9). The ancient Hebrews considered this a reasonable arrangement.

在許多社會中，婦女只是男人的財產，通常是她們的父親、丈夫或兄弟。在許多法律體系中，強姦屬於財產侵犯-換句話說，受害者不是被強姦的女人，而是擁有她的男性。既然如此，法律補救措施就是轉讓所有權-強姦者需要向女人的父親或兄弟支付一定的嫁妝，然後她就成為強姦者的財產。聖經規定“若有人遇見沒有聘定人的已经有男有女的處女，強姦之，被人看見，那強姦之的就要給女孩子的父親五十舍客勒銀子，並且因他玷污了這女孩子，就要娶她為妻。”（《申命記》22:28-29）。古希伯來人認為這是一個合理的安排。

Raping a woman who did not belong to any man was not considered a crime at all, just as picking up a lost coin on a busy street is not considered theft. And if a husband raped his own wife, he had committed no crime. In fact, the idea that a husband could rape his wife was an oxymoron. To be a husband was to have full control of your wife's sexuality. To say that a husband 'raped' his wife was as illogical as saying that a man stole his own wallet. Such thinking was not confined to the ancient Middle East. As of 2006, there were still fifty-three countries where a husband could not be prosecuted for

the rape of his wife. Even in Germany, rape laws were amended only in 1997 to create a legal category of marital rape.⁵

Is the division into men and women a product of the imagination, like the caste system in India and the racial system in America, or is it a natural division with deep biological roots? And if it is indeed a natural division, are there also biological explanations for the preference given to men over women?

強暴一名沒有任何男人所有權的女人唯恐並不視為犯罪，就像在熙熙攘攘的街上撿到一枚失落的硬幣並不視為偷竊。如果丈夫強暴自己的妻子，他並沒有犯罪。事實上，丈夫可以強暴妻子這種想法就是自相矛盾的。要成為一個丈夫就是要完全掌控妻子的性。說丈夫“強暴”妻子就像說一個人偷了自己的錢包一樣不合邏輯。這種想法不僅存在於古代中東。截至2006年，仍有53個國家可以不為丈夫強暴妻子的行為起訴。即使在德國，強姦法律也僅在1997年修訂，建立了婚姻強暴的法律分類。男女分工是想像的產物，就像印度的種姓制度和美國的種族制度一樣嗎？還是它是一個有著深刻生物學根源的自然分工？如果它確實是一個自然的分工，是否也有生物學解釋男性優先的偏好呢？

Some of the cultural, legal and political disparities between men and women reflect the obvious biological differences between the sexes. Childbearing has always been women's job, because men don't have wombs. Yet around this hard universal kernel, every society accumulated layer upon layer of cultural ideas and norms that have little to do with biology. Societies associate a host of attributes with masculinity and femininity that, for the most part, lack a firm biological basis.

For instance, in democratic Athens of the fifth century BC , an individual possessing a womb had no independent legal status and was forbidden to participate in popular assemblies or to be a judge. With few exceptions, such an individual could not benefit from a good education, nor engage in business or in philosophical discourse. None of Athens' political leaders, none of its great philosophers, orators, artists or merchants had a womb. Does having a womb make a person unfit, biologically, for these professions? The ancient Athenians thought so. Modern Athenians disagree. In present-day Athens, women vote, are elected to public office, make speeches, design everything

from jewellery to buildings to software, and go to university. Their wombs do not keep them from doing any of these things as successfully as men do. True, they are still under-represented in politics and business – only about 12 per cent of the members of Greece's parliament are women. But there is no legal barrier to their participation in politics, and most modern Greeks think it is quite normal for a woman to serve in public office.

男女之間的文化、法律和政治差異之一，反映了明顯的生理差異。因為男人沒有子宮，生孩子一直是女人的工作。然而，每個社會都圍繞這個普遍的核心，積累了一層又一層的文化觀念和規範，與生物學幾乎無關。社會將大量的特質與男性和女性聯繫起來，而這些特質在很大程度上缺乏生物基礎。例如，在公元前五世紀的民主雅典中，擁有子宮的人沒有獨立的法律地位，被禁止參加大眾集會或擔任法官。除了少數例外情況，這樣的人不能受益於良好的教育，也不能從事商業或哲學上的討論。雅典的政治領袖、偉大的哲學家、演說家、藝術家或商人都沒有子宮。擁有子宮的人生理上是否不適合從事這些職業呢？古代的雅典人認為是。現代的雅典人不同意這種看法。在現今的雅典，女性投票，當選公職，發表演講，設計從珠寶到建築再到軟體的一切，上大學。她們的子宮不會阻礙她們像男性一樣成功地從事這些事情。確實，她們在政治和商業上仍然低於男性——只有大約12%的希臘國會議員是女性。但是，她們參與政治沒有法律障礙，大多數現代希臘人認為女性擔任公職是很正常的。

Many modern Greeks also think that an integral part of being a man is being sexually attracted to women only, and having sexual relations exclusively with the opposite sex. They don't see this as a cultural bias, but rather as a biological reality – relations between two people of the opposite sex are natural, and between two people of the same sex unnatural. In fact, though, Mother Nature does not mind if men are sexually attracted to one another. It's only human mothers steeped in particular cultures who make a scene if their son has a fling with the boy next door. The mother's tantrums are not a biological imperative. A significant number of human cultures have viewed homosexual relations as not only legitimate but even socially constructive, ancient Greece being the most notable example. The *Iliad* does not mention that Thetis had any objection to her son Achilles' relations with Patroclus. Queen Olympias of Macedon was one of the most temperamental and forceful women of the ancient world, and even had her own husband, King

Philip, assassinated. Yet she didn't have a fit when her son, Alexander the Great, brought his lover Hephaestion home for dinner.

許多現代希臘人認為，作為一個男人的重要元素是只對女性有性吸引力，並僅與異性進行性關係。他們不認為這是文化偏見，而是生物學上的現實-異性之間的關係是自然的，同性之間的關係是不自然的。

實際上，大自然並不在意男人是否對彼此有性吸引力。只有在特定文化中沉淪的人類母親才會因為兒子和隔壁男孩有關係而生氣。母親的發飆不是生物學的必然。許多人類文化都認為同性戀關係不僅合法，甚至有建設性，古希臘就是最明顯的例子。《伊利亞特》沒有提到忒提斯對她的兒子阿喀琉斯和帕特羅克洛斯的關係有任何反對意見。馬其頓的奧林匹亞皇后是古代世界中最具脾氣以及有力的女性之一，甚至把自己的丈夫腓力國王暗殺了。但她並沒有因為兒子亞歷山大大帶他的情人赫法斯托恩回家共進晚餐而大發雷霆。

How can we distinguish what is biologically determined from what people merely try to justify through biological myths? A good rule of thumb is 'Biology enables, Culture forbids.' Biology is willing to tolerate a very wide spectrum of possibilities. It's culture that obliges people to realise some possibilities while forbidding others. Biology enables women to have children – some cultures oblige women to realise this possibility. Biology enables men to enjoy sex with one another – some cultures forbid them to realise this possibility.

Culture tends to argue that it forbids only that which is unnatural. But from a biological perspective, nothing is unnatural. Whatever is possible is by definition also natural. A truly unnatural behaviour, one that goes against the laws of nature, simply cannot exist, so it would need no prohibition. No culture has ever bothered to forbid men to photosynthesise, women to run faster than the speed of light, or negatively charged electrons to be attracted to each other.

我們如何區別生物因素導致的現象和人們僅透過生物迷思來護航的現象？一個好的準則是：“生物促成，文化禁止”。生物願意容忍非常寬泛的可能性；而文化迫使人們實現某些可能性，同時禁止其他可能性。生物促成女性懷孕，一些文化迫使女性實現這種可能性；生物促成男性互相享受性行為，一些文化禁止男性實現這種可能性。文化通

常主張只禁止不自然的事物。但從生物學角度來看，沒有東西是不自然的，任何可能存在事物都被認為是自然的。真正不自然的行為，也就是違反自然法則的行為，實際上是不存在的，因此不需要禁止。沒有哪種文化會花時間去禁止男性進行光合作用，禁止女性跑得比光速還要快，或者禁止負電子互相吸引。

In truth, our concepts ‘natural’ and ‘unnatural’ are taken not from biology, but from Christian theology. The theological meaning of ‘natural’ is ‘in accordance with the intentions of the God who created nature’. Christian theologians argued that God created the human body, intending each limb and organ to serve a particular purpose. If we use our limbs and organs for the purpose envisioned by God, then it is a natural activity. To use them differently than God intends is unnatural. But evolution has no purpose. Organs have not evolved with a purpose, and the way they are used is in constant flux. There is not a single organ in the human body that only does the job its prototype did when it first appeared hundreds of millions of years ago. Organs evolve to perform a particular function, but once they exist, they can be adapted for other usages as well. Mouths, for example, appeared because the earliest multicellular organisms needed a way to take nutrients into their bodies. We still use our mouths for that purpose, but we also use them to kiss, speak and, if we are Rambo, to pull the pins out of hand grenades. Are any of these uses unnatural simply because our worm-like ancestors 600 million years ago didn’t do those things with their mouths?

事實上，我們所謂的“自然”和“不自然”概念並不是來自生物學，而是來自基督教神學。“自然”在神學上的意義是“符合創造自然的上帝的意圖”。基督教神學家認為上帝創造了人類的身體，目的是讓每個器官都能發揮特定的功能。如果我們使用的肢體和器官符合上帝的設想，那麼它就是一種自然的活動。如果我們使用它們的方式與上帝的意圖不同，那麼就是不自然的。但是進化沒有目的。器官沒有隨著特定的目的進行進化，而它們的使用方式是不斷變化的。人體中沒有一個器官只是做其原型在幾億年前首次出現時所做的工作。器官進化是為了發揮特定的功能，但是一旦存在，它們也可以被用於其他用途。例如，口出現是因為最早的多細胞生物需要一種進食的方式。我們現在仍然用口進食，但我們也用口親吻、說話，如果是拉姆波，還可以用口拉手榴彈的引腳。這些用途是否不自然，僅僅因為6億年前的蟲狀祖先沒有用它們的嘴做這些事情？

Similarly, wings didn't suddenly appear in all their aerodynamic glory. They developed from organs that served another purpose. According to one theory, insect wings evolved millions of years ago from body protrusions on flightless bugs. Bugs with bumps had a larger surface area than those without bumps, and this enabled them to absorb more sunlight and thus stay warmer. In a slow evolutionary process, these solar heaters grew larger. The same structure that was good for maximum sunlight absorption – lots of surface area, little weight – also, by coincidence, gave the insects a bit of a lift when they skipped and jumped. Those with bigger protrusions could skip and jump farther. Some insects started using the things to glide, and from there it was a small step to wings that could actually propel the bug through the air. Next time a mosquito buzzes in your ear, accuse her of unnatural behaviour. If she were well behaved and content with what God gave her, she'd use her wings only as solar panels.

類似地，翅膀不會突然出現在所有的空氣動力學榮耀中。它們是從原本有其他用途的器官演變而來。根據一種理論，昆蟲翅膀於數百萬年前從無法飛行的昆蟲身上的身體突起演化而來。有隆起的蟲子比沒有隆起的蟲子表面積更大，因此可以吸收更多的陽光，從而保持溫暖。在緩慢的進化過程中，這些太陽能加熱器變得越來越大。具有最大表面積的相同結構 - 大量表面積，輕量級 - 巧合地使昆蟲在跳躍時也具有一點升力。有較大的突起的昆蟲可以跳躍更遠。一些昆蟲開始使用這些東西飛滑，從那裡到實際推動昆蟲穿過空氣的翅膀只有一點點的距離。下一次蚊子在你的耳邊嗡嗡叫時，指責她不自然的行為。如果她表現得很好，滿足上帝給她的東西，她會將翅膀僅用作太陽能電池板。

The same sort of multitasking applies to our sexual organs and behaviour. Sex first evolved for procreation and courtship rituals as a way of sizing up the fitness of a potential mate. But many animals now put both to use for a multitude of social purposes that have little to do with creating little copies of themselves. Chimpanzees, for example, use sex to cement political alliances, establish intimacy and defuse tensions. Is that unnatural?

Sex and Gender

There is little sense, then, in arguing that the natural function of women is to give birth, or that homosexuality is unnatural. Most of the laws, norms, rights and obligations that define manhood and womanhood reflect human imagination more than biological reality.

Biologically, humans are divided into males and females. A male *Homo sapiens* is one who has one X chromosome and one Y chromosome; a female is one with two Xs. But ‘man’ and ‘woman’ name social, not biological, categories. While in the great majority of cases in most human societies men are males and women are females, the social terms carry a lot of baggage that has only a tenuous, if any, relationship to the biological terms. A man is not a Sapiens with particular biological qualities such as XY chromosomes, testicles and lots of testosterone. Rather, he fits into a particular slot in his society’s imagined human order. His culture’s myths assign him particular masculine roles (like engaging in politics), rights (like voting) and duties (like military service). Likewise, a woman is not a Sapiens with two X chromosomes, a womb and plenty of oestrogen. Rather, she is a female member of an imagined human order. The myths of her society assign her unique feminine roles (raising children), rights (protection against violence) and duties (obedience to her husband). Since myths, rather than biology, define the roles, rights and duties of men and women, the meaning of ‘manhood’ and ‘womanhood’ have varied immensely from one society to another.

多工的機能也適用於我們的性器官和行為。性首先演化出來是為了繁殖和求偶禮儀，作為評估潛在配偶健康狀況的方法。然而，現在許多動物將其用於不少社會目的，這與製造自己的小複製體無關。例如，黑猩猩使用性來鞏固政治聯盟、建立親密關係和化解緊張局勢。這是不自然的嗎？因此，辯論女性的自然功能是生育，或同性戀是不自然的沒有什麼意義。界定男性和女性的法律、慣例、權利和義務，大致上反映了人類幻想而非生物現實。從生物學角度來看，人類被分為男性和女性。一個雄性智人擁有一條X染色體和一條Y染色體；而雌性則擁有兩條X染色體。但是，“男人”和“女人”是社會而非生物類別的名稱。在大多數人類社會中，男人是雄性，女人是雌性，但是社會術語背負了很多與生物術語微弱或無關的隱含意義。一個男人不是具有特定生物特質的智人，例如XY染色體、睪丸和大量睪酮激素。相反，他符合其社會幻想人類秩序中的特定位置。他的文化神話賦予他特定的

男性角色(如從事政治)、權利(如投票)和義務(如軍事服役)。同樣，一個女人不是具有兩條X染色體、子宮和豐富的雌激素的智人，而是一個屬於幻想人類秩序的女性成員。她的社會神話賦予她獨特的女性角色(撫養孩子)、權利(免於暴力)和義務(服從丈夫)。由於神話而非生物學，定義男人和女人的角色、權利和義務，所以“男性”和“女性”的含義在不同社會之間變化巨大。

A female = a biological category		A woman = a cultural category	
Ancient Athens	Modern Athens	Ancient Athens	Modern Athens
XX chromosomes	XX chromosomes	Can't vote	Can vote
Womb	Womb	Can't be a judge	Can be a judge
Ovaries	Ovaries	Can't hold government office	Can hold government office
Little testosterone	Little testosterone	Can't decide for herself who to marry	Can decide for herself who to marry
Much oestrogen	Much oestrogen	Typically illiterate	Typically literate
Can produce milk	Can produce milk	Legally owned by father or husband	Legally independent
Exactly the same thing		Very different things	



22. Eighteenth-century masculinity: an official portrait of King Louis XIV of France. Note the long wig, stockings, high-heeled shoes, dancers posture – and huge sword. In contemporary Europe, all these (except for the sword) would be considered marks of effeminacy. But in his time Louis was a European paragon of manhood and virility .



23. Twenty-first-century masculinity: an official portrait of Barack Obama. What happened to the wig, stockings, high heels – and sword? Dominant men have never looked so dull and dreary as they do today. During most of history, dominant men have been colourful and flamboyant, such as American Indian chiefs with their feathered headdresses and Hindu maharajas decked out in silks and diamonds. Throughout the animal kingdom males tend to be more colourful and accessorised than females – think of peacocks' tails and lions' manes .

22. 十八世紀男子氣概: 法國路易十四國王的官方肖像畫。需要注意的有, 長鬢、長筒襪、高跟鞋、舞者姿態-還有那把巨劍。在當代歐洲, 所有這些(巨劍除外)都被認為是女性特質的標誌。但在他的時間裡, 路易是歐洲男子氣概和男性力量的典範。23. 二十一世紀男子氣概: 貝拉克·奧巴馬的官方肖像畫。假髮、長筒襪、高跟鞋和劍都去哪了? 在多數的歷史時期, 掌權的男人都是豔麗和浮華的, 像是美洲印第安部落長者那鮮豔的羽飾帽, 或印度的大君穿著綢緞和鑽石。在動物王國裡, 雄性往往比雌性更色彩繽紛和絢麗, 想想孔雀的尾巴和獅子的鬃毛。現代社會中掌權的男人似乎從未像今日一樣枯燥乏味。

To make things less confusing, scholars usually distinguish between 'sex', which is a biological category, and 'gender', a cultural category. Sex is divided between males and females, and the qualities of this division are objective and have remained constant throughout history. Gender is divided between men and women (and some cultures recognise other categories). So-called 'masculine' and 'feminine' qualities are inter-subjective and undergo constant changes. For example, there are far-reaching differences in the behaviour, desires, dress and even body posture expected from women in classical Athens and women in modern Athens. ⁶

Sex is child's play; but gender is serious business. To get to be a member of the male sex is the simplest thing in the world. You just need to be born with an X and a Y chromosome. To get to be a female is equally simple. A pair of X chromosomes will do it. In contrast, becoming a man or a woman is a very complicated and demanding undertaking. Since most masculine and feminine qualities are cultural rather than biological, no society automatically crowns each male a man, or every female a woman. Nor are these titles laurels that can be rested on once they are acquired. Males must prove their masculinity constantly, throughout their lives, from cradle to grave, in an endless series of rites and performances. And a woman's work is never done – she must continually convince herself and others that she is feminine enough.

為了讓事情變得不那麼混亂, 學者通常區分「性」和「性別」。性是一個生物學的分類, 性別是一個文化的分類。性別區分為男性和女性(有些文化承認其他分類)。所謂的「男性」和「女性」品質是相互主觀的, 而且經常變化。例如, 在古典雅典的女性和現代雅典的女性之間, 在行為、欲望、服裝甚至身體姿勢方面存在著深遠的差異。性

是兒童的遊戲;但性別是嚴肅的事情。成為男性的成員是世界上最簡單的事情。你只需要出生時有一對X和Y染色體。成為女性同樣簡單。一對X染色體就搞定了。相比之下，成為男人或女人是一個非常複雜而且要求高的過程。由於大多數男性和女性品質是文化而不是生物的，沒有任何社會自動稱每個男人為男人，或每個女人為女人。這些稱號也不是一旦獲得了就可以喘口氣的榮譽。男性必須在他們的一生中，從搖籃到墳墓，不斷證明他們的男子氣概，在不斷的儀式和表演中不斷挑戰自己。而女人的工作永遠不會結束-她必須不斷地向自己和他人證明她足夠女性化。

Success is not guaranteed. Males in particular live in constant dread of losing their claim to manhood. Throughout history, males have been willing to risk and even sacrifice their lives, just so that people will say ‘He’s a real man!’

What’s So Good About Men?

At least since the Agricultural Revolution, most human societies have been patriarchal societies that valued men more highly than women. No matter how a society defined ‘man’ and ‘woman’, to be a man was always better. Patriarchal societies educate men to think and act in a masculine way and women to think and act in a feminine way, punishing anyone who dares cross those boundaries. Yet they do not equally reward those who conform. Qualities considered masculine are more valued than those considered feminine, and members of a society who personify the feminine ideal get less than those who exemplify the masculine ideal. Fewer resources are invested in the health and education of women; they have fewer economic opportunities, less political power, and less freedom of movement. Gender is a race in which some of the runners compete only for the bronze medal.

成功不是必然的。男性尤其不斷擔心失去男子氣概的地位。歷史上，男性為了讓人們稱讚「他是一個真正的男人」而願意冒險甚至犧牲生命。自農業革命以來，大多數人類社會都是男性至上的社會，男性的價值高於女性。不論一個社會如何定義「男人」和「女人」，成為男人總是更好的。父權社會教育男性以男性方式思考和行動，女性以女性方式思考和行動，懲罰任何冒犯性別規範的人。然而，他們並不平

等地獎勵那些遵從的人。被認為具有男性特質的品質比那些被認為具有女性特質的品質更有價值，符合女性理想形象的社會成員比符合男性理想形象的人得到的較少。女性的健康和教育得到的資源更少；她們的經濟機會更少，政治權力更少，移動自由更少。性別是一場比賽，在這個比賽中，一些參賽者僅僅為了銅牌而競爭。

True, a handful of women have made it to the alpha position, such as Cleopatra of Egypt, Empress Wu Zetian of China (c. AD 700) and Elizabeth I of England. Yet they are the exceptions that prove the rule. Throughout Elizabeth's forty-five-year reign, all Members of Parliament were men, all officers in the Royal Navy and army were men, all judges and lawyers were men, all bishops and archbishops were men, all theologians and priests were men, all doctors and surgeons were men, all students and professors in all universities and colleges were men, all mayors and sheriffs were men, and almost all the writers, architects, poets, philosophers, painters, musicians and scientists were men.

Patriarchy has been the norm in almost all agricultural and industrial societies. It has tenaciously weathered political upheavals, social revolutions and economic transformations. Egypt, for example, was conquered numerous times over the centuries. Assyrians, Persians, Macedonians, Romans, Arabs, Mameluks, Turks and British occupied it – and its society always remained patriarchal. Egypt was governed by pharaonic law, Greek law, Roman law, Muslim law, Ottoman law and British law – and they all discriminated against people who were not ‘real men’.

確實，一小部分的女性曾經成為過領袖，比如埃及的克麗奧佩脫拉、中國唐代的武則天（公元700年左右）和英國的伊利沙伯一世。然而，她們是被證明那個規則的例外。在伊利沙伯統治的45年裡，所有議會成員都是男性，所有皇家海軍和陸軍的軍官都是男性，所有法官和律師都是男性，所有主教和大主教都是男性，所有神學家和神父都是男性，所有醫生和外科醫生都是男性，在所有的大學和學院裡的所有學生和教授都是男性，所有市長和治安官都是男性，幾乎所有的作家、建築師、詩人、哲學家、畫家、音樂家和科學家也都是男性。父權體制幾乎是所有農業和工業社會的常態。它頑強地經歷了政治動盪、社會革命和經濟轉型。例如，數世紀以來，埃及被征服了許多次。亞述人、波斯人、馬其頓人、羅馬人、阿拉伯人、馬木留克王朝、土耳其

人和英國人都佔領過它，但它的社會始終保持著父權制度。埃及曾由法老的法律、希臘法律、羅馬法律、穆斯林法律、奧斯曼法律和英國法律統治過，但它們都歧視那些不是"真正的男人"的人。

Since patriarchy is so universal, it cannot be the product of some vicious circle that was kick-started by a chance occurrence. It is particularly noteworthy that even before 1492, most societies in both America and Afro-Asia were patriarchal, even though they had been out of contact for thousands of years. If patriarchy in Afro-Asia resulted from some chance occurrence, why were the Aztecs and Incas patriarchal? It is far more likely that even though the precise definition of 'man' and 'woman' varies between cultures, there is some universal biological reason why almost all cultures valued manhood over womanhood. We do not know what this reason is. There are plenty of theories, none of them convincing.

Muscle Power

The most common theory points to the fact that men are stronger than women, and that they have used their greater physical power to force women into submission. A more subtle version of this claim argues that their strength allows men to monopolise tasks that demand hard manual labour, such as ploughing and harvesting. This gives them control of food production, which in turn translates into political clout.

由於父權制非常普遍，因此它不可能是某些惡性循環的產物，該循環是由偶然事件開始的。特別值得注意的是，即使在1492年之前，美洲和非洲-亞洲的大多數社會都是父權制的，即使它們在許多年的時間裡已經脫離了接觸。如果非洲-亞洲的父權制是源於某些偶然事件，為什麼阿茲特克人和印加人也是父權制的呢？更有可能的是，儘管“男人”和“女人”的確切定義因文化而異，但幾乎所有文化都珍視男子氣概勝過女性原因有某種普遍的生物學原因，我們不知道這個原因是什麼。有很多理論，但沒有一個令人信服的。最常見的理論指出，男性比女性更強壯，他們利用自己更大的身體力量強迫女性服從。這種主張的更微妙版本則認為，男性的力量使他們壟斷了需要艱苦體力勞動的任務，例如犁地和收割。這使他們控制了食品生產，進而轉化為政治影響力。

There are two problems with this emphasis on muscle power. First, the statement that men are stronger than women' is true only on average, and only with regard to certain types of strength. Women are generally more resistant to hunger, disease and fatigue than men. There are also many women who can run faster and lift heavier weights than many men. Furthermore, and most problematically for this theory, women have, throughout history, been excluded mainly from jobs that require little physical effort (such as the priesthood, law and politics), while engaging in hard manual labour in the fields, in crafts and in the household. If social power were divided in direct relation to physical strength or stamina, women should have got far more of it.

Even more importantly, there simply is no direct relation between physical strength and social power among humans. People in their sixties usually exercise power over people in their twenties, even though twentysomethings are much stronger than their elders. The typical plantation owner in Alabama in the mid-nineteenth century could have been wrestled to the ground in seconds by any of the slaves cultivating his cotton fields. Boxing matches were not used to select Egyptian pharaohs or Catholic popes. In forager societies, political dominance generally resides with the person possessing the best social skills rather than the most developed musculature. In organised crime, the big boss is not necessarily the strongest man. He is often an older man who very rarely uses his own fists; he gets younger and fitter men to do the dirty jobs for him. A guy who thinks that the way to take over the syndicate is to beat up the don is unlikely to live long enough to learn from his mistake. Even among chimpanzees, the alpha male wins his position by building a stable coalition with other males and females, not through mindless violence.

這種強調肌肉力量的觀點存在兩個問題。首先，“男人比女人強壯”這個說法只是平均而言，在某些強度方面才是正確的。女性通常比男性更具抵抗力，對饑餓、疾病和疲勞更具抵抗能力。還有許多女性能夠比很多男性跑得更快或舉起更重的重物。更有問題的是，歷史上女性通常被排除在需要較少體力的職業之外（例如神職、法律和政治），卻在田野、工藝和家務等重體力勞動中進行工作。如果社會權力是根據身體力量或體力持久力分配的話，女性本應該獲得更多權力。更重要的是，在人類中，身體力量和社會權力之間沒有直接關係。六十多

歲的人通常會對二十多歲的人施加權力，儘管二十多歲的人比他們更強壯。19世紀中期阿拉巴馬州的典型種植園主可能會在幾秒鐘內被種植棉花的奴隸制伏。拳擊比賽並未用於選擇埃及法老或天主教教皇。狩獵採集的社會中，政治支配通常歸那些具有更好社交技能而非肌肉發達的人。在有組織的犯罪中，大老闆不一定是最強壯的人。他通常是一個年紀較長的人，很少使用自己的拳頭；他會讓更年輕、更健康的人去為他做骯髒的工作。一個認為可以通過打敗老大來掌控犯罪集團的人不太可能活得足夠長。即使在黑猩猩中，領袖公猩猩取得他的地位是通過與其他公母猩猩建立穩定聯盟，而不是通過盲目的暴力。

In fact, human history shows that there is often an inverse relation between physical prowess and social power. In most societies, it's the lower classes who do the manual labour. This may reflect *Homo sapiens* position in the food chain. If all that counted were raw physical abilities, Sapiens would have found themselves on a middle rung of the ladder. But their mental and social skills placed them at the top. It is therefore only natural that the chain of power within the species will also be determined by mental and social abilities more than by brute force. It is therefore hard to believe that the most influential and most stable social hierarchy in history is founded on men's ability physically to coerce women.

The Scum of Society

Another theory explains that masculine dominance results not from strength but from aggression. Millions of years of evolution have made men far more violent than women. Women can match men as far as hatred, greed and abuse are concerned, but when push comes to shove, the theory goes, men are more willing to engage in raw physical violence. This is why throughout history warfare has been a masculine prerogative.

人類歷史事實上顯示，體能卓越與社會權力常常成反比。在大多數社會中，做體力勞動的通常是下層階級。這可能反映了智人在食物鏈上的位置。如果唯一重要的是原始體能，智人將會處於梯子的中段。但是他們的智力和社交技能將他們置於頂端。因此，物種內的權力鏈條也自然而然地由思維和社交能力而不是武力所決定。因此很難相信，歷史上最有影響力和最穩定的社會等級制度是建立在男性對女性的身

體威脅能力之上的。另一個理論解釋了男性支配不是因為體力，而是來自攻擊性。數百萬年的進化使男性比女性更暴力。女性在憎恨、貪婪和濫用方面可以和男性匹敵，但當局勢迫使時，男性更願意從事原始身體暴力。這就是為什麼歷史上戰爭一直是男性的特權。

In times of war, men's control of the armed forces has made them the masters of civilian society, too. They then used their control of civilian society to fight more and more wars, and the greater the number of wars, the greater men's control of society. This feedback loop explains both the ubiquity of war and the ubiquity of patriarchy.

Recent studies of the hormonal and cognitive systems of men and women strengthen the assumption that men indeed have more aggressive and violent tendencies, and are therefore, on average, better suited to serve as common soldiers. Yet granted that the common soldiers are all men, does it follow that the ones managing the war and enjoying its fruits must also be men? That makes no sense. It's like assuming that because all the slaves cultivating cotton fields are black, plantation owners will be black as well. Just as an all-black workforce might be controlled by an all-white management, why couldn't an all-male soldiery be controlled by an all-female or at least partly female government? In fact, in numerous societies throughout history, the top officers did not work their way up from the rank of private. Aristocrats, the wealthy and the educated were automatically assigned officer rank and never served a day in the ranks.

戰爭時代，男性對武裝力量的掌控使他們成為文明社會的主宰者。他們通過對文明社會的掌控來打鬥更多的戰爭，而戰爭的數量越多，男性對社會的掌控也越大。這種反饋循環解釋了戰爭和家父長制的普遍存在。最近對男女激素和認知系統的研究加強了這樣一種假設，即男性確實具有更具攻擊性和暴力傾向，因此平均而言更適合擔任普通士兵。但是，假如常規士兵都是男性，這是否意味著管理戰爭並享受戰爭成果的人也必須是男性？這是毫無意義的。這就好像假設因為所有種植棉花的奴隸都是黑人，那麼種植園主也一定是黑人一樣。就像全黑人的勞動力可以由全白人管理層控制一樣，為什麼不能由全女性或部分女性的政府控制全男性的士兵？事實上，在歷史上的許多社會中，高級官員並不是從士兵階級晉升上來的。貴族、富人和受過教育的人自動被指定為軍官，從未在士兵階層服役過一天。

When the Duke of Wellington, Napoleon's nemesis, enlisted in the British army at the age of eighteen, he was immediately commissioned as an officer. He didn't think much of the plebeians under his command. 'We have in the service the scum of the earth as common soldiers,' he wrote to a fellow aristocrat during the wars against France. These common soldiers were usually recruited from among the very poorest, or from ethnic minorities (such as the Irish Catholics). Their chances of ascending the military ranks were negligible. The senior ranks were reserved for dukes, princes and kings. But why only for dukes, and not for duchesses?

The French Empire in Africa was established and defended by the sweat and blood of Senegalese, Algerians and working-class Frenchmen. The percentage of well-born Frenchmen within the ranks was negligible. Yet the percentage of well-born Frenchmen within the small elite that led the French army, ruled the empire and enjoyed its fruits was very high. Why just Frenchmen, and not French women?

想起了拿破崙的大敵惠靈頓公爵，當他十八歲加入英國軍隊時，立即獲得了軍官的職位。他對於他指揮下的平民並不是很在意。在對抗法國的戰爭期間，他曾向一位貴族同伴寫道，“我們在軍中常常有世界上最卑鄙的民眾作為普通士兵。”這些普通士兵通常都是從極為貧困的人口中招募，或者從少數族群（例如愛爾蘭天主教徒）中招募。他們晉升軍階的機會非常渺茫。高級軍階是留給公爵、王子和國王的。但是為什麼只給公爵而不給女公爵呢？在非洲建立和保衛法國帝國是由塞內加爾人、阿爾及利亞人和法國工人的血汗所經營。少數出身名門的法國人在其中屬於微不足道。然而在領導法國軍隊、統治帝國並享受其果實的小精英階層中，出身名門的法國人的百分比非常高。為什麼只有法國男性而不是法國女性呢？

In China there was a long tradition of subjugating the army to the civilian bureaucracy, so mandarins who had never held a sword often ran the wars. 'You do not waste good iron to make nails,' went a common Chinese saying, meaning that really talented people join the civil bureaucracy, not the army. Why, then, were all of these mandarins men?

One can't reasonably argue that their physical weakness or low testosterone levels prevented women from being successful mandarins, generals and

politicians. In order to manage a war, you surely need stamina, but not much physical strength or aggressiveness. Wars are not a pub brawl. They are very complex projects that require an extraordinary degree of organisation, cooperation and appeasement. The ability to maintain peace at home, acquire allies abroad, and understand what goes through the minds of other people (particularly your enemies) is usually the key to victory. Hence an aggressive brute is often the worst choice to run a war. Much better is a cooperative person who knows how to appease, how to manipulate and how to see things from different perspectives. This is the stuff empire-builders are made of. The militarily incompetent Augustus succeeded in establishing a stable imperial regime, achieving something that eluded both Julius Caesar and Alexander the Great, who were much better generals. Both his admiring contemporaries and modern historians often attribute this feat to his virtue of *clementia* – mildness and clemency.

在中国，有一种长期的传统，就是将军队置于民间官僚机关之下，因此那些从未拿过剑的文官经常负责战争。一句常见的中国谚语是：“不要用好铁去打钉子”，意思是真正有才华的人会加入民政机构，而不是军队。那么，为什么这些文官中全部都是男性呢？人们不能合理地争辩到他们的身体虚弱或低睾酮水平防止了女性成为成功的文官、将领和政治家。为了管理战争，你肯定需要耐力，但并不需要多么强壮和具有攻击性。战争不是一场酒吧斗殴。他们是非常复杂的项目，需要极高的组织、合作和抚慰程度。能够保持国内和平，获取国外盟友，并了解其他人（特别是你的敌人）的想法，通常是胜利的关键。因此，一个具有攻击性的蛮子通常是运行战争的最糟糕选择。一个更好的选择是一个懂得如何抚慰、如何操纵以及如何从不同角度看问题的合作者。这就是帝国建立者的素质所在。军事上无能的奥古斯都成功建立了一个稳定的帝国政权，取得了庞大的成就，这一点是犹利斯·凯撒和亚历山大大帝都未能做到的，他们都是更好的将领。他受到了他的同时代人和现代历史学家的赞许，他们经常将这一壮举归功于他的温良、慈悲的美德。

Women are often stereotyped as better manipulators and appeasers than men, and are famed for their superior ability to see things from the perspective of others. If there's any truth in these stereotypes, then women should have made excellent politicians and empire-builders, leaving the dirty work on the battlefields to testosterone-charged but simple-minded machos. Popular

myths notwithstanding, this rarely happened in the real world. It is not at all clear why not.

Patriarchal Genes

A third type of biological explanation gives less importance to brute force and violence, and suggests that through millions of years of evolution, men and women evolved different survival and reproduction strategies. As men competed against each other for the opportunity to impregnate fertile women, an individual's chances of reproduction depended above all on his ability to outperform and defeat other men. As time went by, the masculine genes that made it to the next generation were those belonging to the most ambitious, aggressive and competitive men.

女性常被刻板印象為比男性更擅長操縱和安撫他人，以及擁有卓越的從他人角度看事情的能力。如果這些刻板印象有一些真實性，那麼女性應該成為優秀的政治家和帝國建立者，把骯髒的戰爭留給充滿睟酮但心思簡單的男性。儘管有流行的神話存在，但在現實世界中很少發生。為什麼不是很明顯。第三種生物學解釋類型不那麼重視野蠻力量和暴力，而是提出通過數百萬年的演化，男性和女性演變出不同的生存和繁殖策略。當男性相互競爭以獲得機會與肥沃的女性交配時，一個人的繁殖機會首先取決於他能否勝過其他男性。隨著時間的推移，進入下一代的男性基因是屬於最有野心，最有進攻性和競爭性的男性。

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

然而，女性很容易就能找到想讓她懷孕的男人。然而，如果她想讓她的孩子給她帶來孫子，她需要在自己的子宮裡負荊請罪長達九個辛苦的月份，然後幾年來培養他們。在這段時間裡，她有較少機會獲得食物，需要很多幫助。她需要一個男人。為了確保自己和孩子的生存，女性沒有其他選擇，只能同意男人所要求的任何條件，讓他留下並分擔負擔。隨著時間的推移，那些傳遞到下一代的女性基因屬於順從的看護人。那些花太多時間爭權奪利的婦女沒有留下任何強大的基因給後代。

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

But this approach also seems to be belied by the empirical evidence. Particularly problematic is the assumption that women's dependence on external help made them dependent on men, rather than on other women, and that male competitiveness made men socially dominant. There are many species of animals, such as elephants and bonobo chimpanzees, in which the dynamics between dependent females and competitive males results in a *matriarchal* society. Since females need external help, they are obliged to develop their social skills and learn how to cooperate and appease. They construct all-female social networks that help each member raise her children. Males, meanwhile, spend their time fighting and competing. Their social skills and social bonds remain underdeveloped. Bonobo and elephant societies are controlled by strong networks of cooperative females, while the self-centred and uncooperative males are pushed to the sidelines. Though bonobo females are weaker on average than the males, the females often gang up to beat males who overstep their limits.

理論認為，不同的生存策略所帶來的結果是，男人被設計成野心勃勃和競爭激烈，擅長政治和商業，而女人則傾向於避開競爭並將生命奉獻給扶養孩子。但這種方法似乎被實證證據所否定。特別有問題的是，女性對外部幫助的依賴使她們依賴男性，而不是其他女性，而男性的競爭性使男性在社會上佔主導地位的假設。有許多動物物種，如大象和倭黑猩猩，這些依賴女性和具競爭性的男性之間的動態結果是母系社會。由於雌性需要外部幫助，她們被迫發展社交技能和學習如

何合作和安撫。他們建立全女性社交網絡，幫助每位成員撫養孩子。而男性則花時間打鬥和競爭。他們的社交技能和社交關係保持不發展。猩猩和大象社會由合作的雌性控制，而以自我為中心和不合作的雄性被推到了邊緣。雖然黑猩猩雌性的平均力量弱於雄性，但雌性經常聚集起來擊敗超出界限的雄性。

If this is possible among bonobos and elephants, why not among *Homo sapiens*? *Sapiens* are relatively weak animals, whose advantage rests in their ability to cooperate in large numbers. If so, we should expect that dependent women, even if they are dependent on men, would use their superior social skills to cooperate to outmanoeuvre and manipulate aggressive, autonomous and self-centred men.

How did it happen that in the one species whose success depends above all on cooperation, individuals who are supposedly less cooperative (men) control individuals who are supposedly more cooperative (women)? At present, we have no good answer. Maybe the common assumptions are just wrong. Maybe males of the species *Homo sapiens* are characterised not by physical strength, aggressiveness and competitiveness, but rather by superior social skills and a greater tendency to cooperate. We just don't know.

如果這對於倭黑猩猩和大象是可能的，為什麼沒有可能發生在智人之間？智人是比較弱的動物，其優勢在於他們能夠在大量數目下進行合作。因此，我們應該預期，即使是依賴男性的女性也會利用他們優越的社交技能，進行合作，以制勝和操作好戰、自主且自我中心的男性。在那些成功都依賴合作的物種中，為什麼被認為合作程度較低的人（男性）控制著被認為合作程度較高的人（女性）？目前，我們沒有一個好的答案。也許一般的假設是錯誤的。也許人類物種的男性不是以身體力量、攻擊性和競爭性為特點，而是以優越的社交技能和更大的合作傾向為特點。我們只是不知道。

What we do know, however, is that during the last century gender roles have undergone a tremendous revolution. More and more societies today not only give men and women equal legal status, political rights and economic opportunities, but also completely rethink their most basic conceptions of gender and sexuality. Though the gender gap is still significant, events have been moving at a breathtaking speed. At the beginning of the twentieth

century the idea of giving voting rights to women was generally seen in the USA as outrageous; the prospect of a female cabinet secretary or Supreme Court justice was simply ridiculous; whereas homosexuality was such a taboo subject that it could not even be openly discussed. At the beginning of the twenty-first century women's voting rights are taken for granted; female cabinet secretaries are hardly a cause for comment; and in 2013 five US Supreme Court justices, three of them women, decided in favour of legalising same-sex marriages (overruling the objections of four male justices).

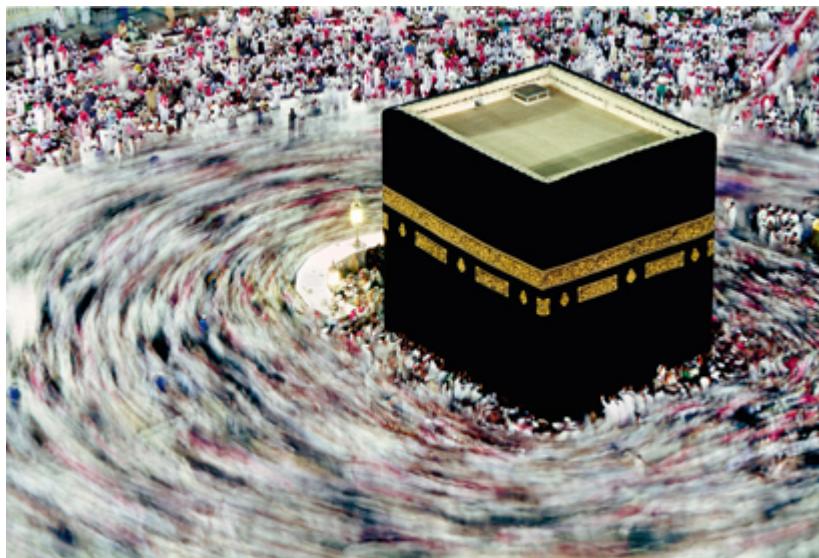
然而，我們所知道的是，在上一個世紀，性別角色經歷了極大的革命。今天，越來越多的社會不僅給予男性和女性平等的法律地位、政治權利和經濟機會，而且還徹底重新思考了他們對性別和性取向最基本的概念。儘管性別差距仍然存在，但這些事件發展速度驚人。二十世紀初，給予婦女選舉權在美國普遍被認為是荒唐的想法；女性內閣部長或最高法院法官的前景簡直是荒謬的；而同性戀如此禁忌，以至於無法公開討論。但到了21世紀初，婦女的投票權被視為理所當然；女性內閣部長幾乎不會引起討論；在2013年，五名美國最高法院法官——其中三名女性——決定支持同性婚姻合法化，推翻了四名男性法官的反對意見。

These dramatic changes are precisely what makes the history of gender so bewildering. If, as is being demonstrated today so clearly, the patriarchal system has been based on unfounded myths rather than on biological facts, what accounts for the universality and stability of this system?

這些戲劇性的變化正是性別歷史如此令人困惑的原因。如果像今天所證明的那樣，父權制度不是基於生物學事實而是建立在無根據的神話上，那麼這種體系的普及性和穩定性又是如何解釋的？

Part Three

The Unification of Humankind



24. Pilgrims circling the Ka'aba in Mecca .

24. 朝圣者在麦加环绕圣佑石。

9

The Arrow of History

AFTER THE AGRICULTURAL REVOLUTION, human societies grew ever larger and more complex, while the imagined constructs sustaining the social order also became more elaborate. Myths and fictions accustomed people, nearly from the moment of birth, to think in certain ways, to behave in accordance with certain standards, to want certain things, and to observe certain rules. They thereby created artificial instincts that enabled millions of strangers to cooperate effectively. This network of artificial instincts is called culture'.

During the first half of the twentieth century, scholars taught that every culture was complete and harmonious, possessing an unchanging essence that defined it for all time. Each human group had its own world view and system of social, legal and political arrangements that ran as smoothly as the planets going around the sun. In this view, cultures left to their own devices did not change. They just kept going at the same pace and in the same direction. Only a force applied from outside could change them. Anthropologists, historians and politicians thus referred to 'Samoan Culture' or 'Tasmanian Culture' as if the same beliefs, norms and values had characterised Samoans and Tasmanians from time immemorial.

農業革命之後，人類社會不斷增長，變得更加複雜，同時支撐社會秩序的想像構造也變得更加複雜。神話和小說慣例地引導人們從出生時起以某種方式思考，按照某些標準行為，渴望某些東西並遵守某些規則。它們因此創造了人工的本能，使數以百萬計的陌生人能夠有效地合作。這種人工本能的網絡被稱為文化。在二十世紀上半葉，學者們教導人們，每一種文化都是完整和和諧的，擁有一個不變的本質，將其定義為永恆不變。每個人類群體都有自己的世界觀和社會、法律以及政治安排系統，其運行就像行星圍繞太陽一樣平穩。在這種觀點中，文化在不受干擾的情況下不會改變。它們只會以相同的速度和相

同的方向繼續前進。只有從外部施加的力量才能改變它們。人類學家、歷史學家和政治家因此稱之為“薩摩亞文化”或“塔斯馬尼亞文化”，好像自從遠古時代以來，薩摩亞人和塔斯馬尼亞人一直具有相同的信仰、規範和價值觀。

Today, most scholars of culture have concluded that the opposite is true. Every culture has its typical beliefs, norms and values, but these are in constant flux. The culture may transform itself in response to changes in its environment or through interaction with neighbouring cultures. But cultures also undergo transitions due to their own internal dynamics. Even a completely isolated culture existing in an ecologically stable environment cannot avoid change. Unlike the laws of physics, which are free of inconsistencies, every man-made order is packed with internal contradictions. Cultures are constantly trying to reconcile these contradictions, and this process fuels change.

For instance, in medieval Europe the nobility believed in both Christianity and chivalry. A typical nobleman went to church in the morning, and listened as the priest held forth on the lives of the saints. ‘Vanity of vanities,’ said the priest, ‘all is vanity. Riches, lust and honour are dangerous temptations. You must rise above them, and follow in Christ’s footsteps. Be meek like Him, avoid violence and extravagance, and if attacked – just turn the other cheek.’ Returning home in a meek and pensive mood, the nobleman would change into his best silks and go to a banquet in his lord’s castle. There the wine flowed like water, the minstrel sang of Lancelot and Guinevere, and the guests exchanged dirty jokes and bloody war tales. ‘It is better to die,’ declared the barons, ‘than to live with shame. If someone questions your honour, only blood can wipe out the insult. And what is better in life than to see your enemies flee before you, and their pretty daughters tremble at your feet?’

今天，大多數文化學者已經得出相反的結論。每個文化都有其典型的信仰、規範和價值觀，但這些都在不斷變化。文化可能會因應其環境的變化或與周邊文化的互動而轉型。但文化也會因其內在動力而經歷轉變。即使是在生態穩定環境中的完全孤立的文化也無法避免變化。與物理定律不同，人造秩序充滿內部矛盾。文化不斷試圖調和這些矛盾，這個過程推動了改變。例如，在中世紀的歐洲，貴族既相信

基督教，也相信騎士道。典型的貴族早上去教堂聽牧師講述聖人的生平。牧師說：“虛榮都是虛空，財富、欲望和榮譽都是危險的誘惑。你必須超越它們，跟隨基督的腳步。像他一樣溫順，避免暴力和揮霍，如果被攻擊——只需轉過另一邊臉。”貴族回家後心情沉靜，穿上最好的絲綢禮服去參加領主城堡的宴會。那裡酒水流淌，吟唱著蘭斯洛特和吉尼維芙，客人之間交換著下流的笑話和血腥的戰爭故事。男爵們說：“從寧願死亡也不願生存的榮譽觀來看，這比什麼都好。如果有人質疑你的榮譽，只有鮮血才能抹去侮辱。人生中有什麼比看到你的敵人在你面前逃跑，他們漂亮的女兒在你腳下發抖更好的選擇？”

The contradiction was never fully resolved. But as the European nobility, clergy and commoners grappled with it, their culture changed. One attempt to figure it out produced the Crusades. On crusade, knights could demonstrate their military prowess and their religious devotion at one stroke. The same contradiction produced military orders such as the Templars and Hospitallers, who tried to mesh Christian and chivalric ideals even more tightly. It was also responsible for a large part of medieval art and literature, such as the tales of King Arthur and the Holy Grail. What was Camelot but an attempt to prove that a good knight can and should be a good Christian, and that good Christians make the best knights?

Another example is the modern political order. Ever since the French Revolution, people throughout the world have gradually come to see both equality and individual freedom as fundamental values. Yet the two values contradict each other. Equality can be ensured only by curtailing the freedoms of those who are better off. Guaranteeing that every individual will be free to do as he wishes inevitably short-changes equality. The entire political history of the world since 1789 can be seen as a series of attempts to reconcile this contradiction.

矛盾始終未被完全解決。但歐洲貴族、教士及平民在掙扎解決這個問題時，他們的文化也進行了改變。其中一個嘗試是發動十字軍東征。騎士在東征中既可以顯示他們的軍事能力，也可以展現他們對宗教的奉獻。同樣的矛盾也導致一些軍事團體如聖殿騎士和醫院騎士團的成立，他們試圖更緊密地結合基督教與騎士道理想。這也是中世紀藝術和文學的重要源頭，例如亞瑟王和聖杯的傳說。卡美洛城不就是為了證明好的騎士也可以是好的基督徒，好的基督徒也是最優秀的騎士

嗎？另一個例子是現代政治秩序。自法國大革命以來，世界各地的人們逐漸認識到平等和個人自由作為基本價值觀。然而這兩個價值觀相互矛盾。只有限制那些更富裕的人的自由，才能保證平等。保障每個人都有自由做他想做的事，無法確保平等。自1789年以來，世界政治史就被視為一系列試圖解決這個矛盾的歷史。

Anyone who has read a novel by Charles Dickens knows that the liberal regimes of nineteenth-century Europe gave priority to individual freedom even if it meant throwing insolvent poor families in prison and giving orphans little choice but to join schools for pickpockets. Anyone who has read a novel by Alexander Solzhenitsyn knows how Communism's egalitarian ideal produced brutal tyrannies that tried to control every aspect of daily life.

Contemporary American politics also revolve around this contradiction. Democrats want a more equitable society, even if it means raising taxes to fund programmes to help the poor, elderly and infirm. But that infringes on the freedom of individuals to spend their money as they wish. Why should the government force me to buy health insurance if I prefer using the money to put my kids through college? Republicans, on the other hand, want to maximise individual freedom, even if it means that the income gap between rich and poor will grow wider and that many Americans will not be able to afford health care.

讀過查爾斯·狄更斯的小說的人都知道，十九世紀歐洲的自由主義政權優先保障個人自由，即使這意味著將破產的窮人家庭關進監獄，讓孤兒只能選擇進入小偷學校。讀過亞歷山大·索爾仁尼琴的小說的人知道，共產主義的平等理想產生的是試圖控制日常生活的殘酷暴政。當代美國政治也圍繞著這個矛盾展開。民主黨想要建立一個更公平的社會，即使這意味著提高稅收，為幫助窮人、老人和虛弱者的計劃提供資金。但這侵犯了個人按照自己的意願支配自己的金錢的自由。如果我更希望用這些錢供我的孩子上大學，為什麼政府要強迫我購買健康保險？另一方面，共和黨人想要盡可能地保障個人自由，即使這意味著富人和窮人之間的收入差距會越來越大，很多美國人將負擔不起醫療保險。

Just as medieval culture did not manage to square chivalry with Christianity, so the modern world fails to square liberty with equality. But this is no

defect. Such contradictions are an inseparable part of every human culture. In fact, they are culture's engines, responsible for the creativity and dynamism of our species. Just as when two clashing musical notes played together force a piece of music forward, so discord in our thoughts, ideas and values compel us to think, reevaluate and criticise. Consistency is the playground of dull minds.

If tensions, conflicts and irresolvable dilemmas are the spice of every culture, a human being who belongs to any particular culture must hold contradictory beliefs and be riven by incompatible values. It's such an essential feature of any culture that it even has a name: cognitive dissonance. Cognitive dissonance is often considered a failure of the human psyche. In fact, it is a vital asset. Had people been unable to hold contradictory beliefs and values, it would probably have been impossible to establish and maintain any human culture.

中世紀文化未能將騎士制度與基督教調和，現代世界同樣未能將自由與平等調和。但這並非缺陷，這樣的矛盾是每個人文化不可分割的一部分，實際上，這正是各文化的引擎，促進了我們物種的創造力和活力。就像播放兩個不協調的音符會強迫一首音樂繼續，我們的思想、觀念和價值觀上的不協調迫使我們思考、重新評估和批判。一致性是遲鈍心智的遊樂場。如果緊張、衝突和無法解決的困境是每個文化的調味料，那麼屬於任何特定文化的人必須持有矛盾的信仰，並被不兼容的價值觀裂成兩半。這是任何文化的基本特徵，它甚至有一個名字：認知失調。認知失調通常被視為人類心理的失敗，實際上，它是一個至關重要的資產。如果人們無法持有矛盾的信仰和價值觀，那麼建立和維護任何文化可能是不可能的。

If, say, a Christian really wants to understand the Muslims who attend that mosque down the street, he shouldn't look for a pristine set of values that every Muslim holds dear. Rather, he should enquire into the catch-22s of Muslim culture, those places where rules are at war and standards scuffle. It's at the very spot where the Muslims teeter between two imperatives that you'll understand them best.

The Spy Satellite

Human cultures are in constant flux. Is this flux completely random, or does it have some overall pattern? In other words, does history have a direction?

The answer is yes. Over the millennia, small, simple cultures gradually coalesce into bigger and more complex civilisations, so that the world contains fewer and fewer mega-cultures, each of which is bigger and more complex. This is of course a very crude generalisation, true only at the macro level. At the micro level, it seems that for every group of cultures that coalesces into a mega-culture, there's a mega-culture that breaks up into pieces. The Mongol Empire expanded to dominate a huge swathe of Asia and even parts of Europe, only to shatter into fragments. Christianity converted hundreds of millions of people at the same time that it splintered into innumerable sects. The Latin language spread through western and central Europe, then split into local dialects that themselves eventually became national languages. But these break-ups are temporary reversals in an inexorable trend towards unity.

如果一個基督徒想真正了解街角那座清真寺的穆斯林，他不應該尋找每一位穆斯林都珍視的一套完美價值觀。相反，他應該探究穆斯林文化中的“第22條”，那些規則互相爭斗且標準互相糾纏的地方。正是在穆斯林在兩個命令之間搖擺的地方，您才能最好地了解他們。人類文化不斷變化。這種變化完全是隨機的嗎？還是有一個整體模式？換句話說，歷史是否有一個方向？答案是肯定的。數千年來，小型簡單的文化逐漸凝聚成更大更複雜的文明，以至於世界上包含的超級文化越來越少，每一個超級文化都更大更複雜。當然，這只是非常粗略的概括，僅在宏觀層面上才是真實的。在微觀層面上，似乎對於每一組凝聚成超級文化的文化群體，都有一個超級文化分裂成碎片。蒙古帝國擴張到支配亞洲的大片土地，甚至部分歐洲，最終破裂成碎片。基督教在同一時間改變了數億人，同時也分裂成無數派系。拉丁語傳播到西歐和中歐，然後分裂成當地方言，這些方言最終成為國家語言。但是，這些分裂只是不可避免的趨勢中的暫時逆轉。

Perceiving the direction of history is really a question of vantage point. When we adopt the proverbial bird's-eye view of history, which examines developments in terms of decades or centuries, it's hard to say whether history moves in the direction of unity or of diversity. However, to understand long-term processes the bird's-eye view is too myopic. We would

do better to adopt instead the viewpoint of a cosmic spy satellite, which scans millennia rather than centuries. From such a vantage point it becomes crystal clear that history is moving relentlessly towards unity. The sectioning of Christianity and the collapse of the Mongol Empire are just speed bumps on history's highway.

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The best way to appreciate the general direction of history is to count the number of separate human worlds that coexisted at any given moment on planet Earth. Today, we are used to thinking about the whole planet as a single unit, but for most of history, earth was in fact an entire galaxy of isolated human worlds.

察覺歷史的方向實在是關乎觀點的問題。當我們以鳥瞰地面的方式來看待歷史，也就是從十年或者幾百年為單位的角度出發，就很難說明歷史是向統一還是多樣性的方向發展。然而，為了理解長期的進程，鳥瞰地面的觀點與其說不夠遠見，倒不如說太過短視。取而代之的，我們更應該使用宇宙間偵察衛星的視角，以千年為度量單位，從這樣的高度觀察，歷史正在不懈地向著統一的方向前進。基督教的分裂和蒙古帝國的崩潰只是歷史大道上的減速帶。瞭解歷史的總體方向，最好的方法就是計算出在地球上的任何時刻，存在著多少個獨立的人類世界。如今，我們習慣將整個地球看作是一個整體，但在大多數歷史時期，地球實際上是一個由孤立的人類世界組成的星系。

Consider Tasmania, a medium-sized island south of Australia. It was cut off from the Australian mainland in about 10,000 BC as the end of the Ice Age caused the sea level to rise. A few thousand hunter-gatherers were left on the island, and had no contact with any other humans until the arrival of the Europeans in the nineteenth century. For 12,000 years, nobody else knew the Tasmanians were there, and they didn't know that there was anyone else in the world. They had their wars, political struggles, social oscillations and cultural developments. Yet as far as the emperors of China or the rulers of Mesopotamia were concerned, Tasmania could just as well have been located on one of Jupiter's moons. The Tasmanians lived in a world of their own.

America and Europe, too, were separate worlds for most of their histories. In AD 378, the Roman emperor Valence was defeated and killed by the Goths at the battle of Adrianople. In the same year, King Chak Tok Ich'aak of Tikal was defeated and killed by the army of Teotihuacan. (Tikal was an important Mayan city state, while Teotihuacan was then the largest city in America, with almost 250,000 inhabitants – of the same order of magnitude as its contemporary, Rome.) There was absolutely no connection between the defeat of Rome and the rise of Teotihuacan. Rome might just as well have been located on Mars, and Teotihuacan on Venus.

考慮塔斯馬尼亞，一個位於澳大利亞南部的中等大小島嶼。隨著冰河時代的結束，海平面上升，約於公元前10,000年，它與澳大利亞大陸斷開。一些數千名獵人和採集者留在島上，直到19世紀歐洲人的到來，他們才與其他人類接觸。在12,000年的時間裡，沒有人知道塔斯馬尼亞人的存在，他們也不知道世界上還有其他人。他們有自己的戰爭，政治鬥爭，社會波動和文化發展。但就像中國的皇帝或美索不達米亞的統治者所認為的那樣，塔斯馬尼亞可能就像位於木星衛星之一的地方。塔斯馬尼亞人生活在自己的世界裡。美洲和歐洲在其大部分歷史上也是分開的世界。公元378年，羅馬皇帝維倫斯在亞德里安堡之戰中被哥特族擊敗並殺害。同一年，蒂卡爾的查克·托克·伊查克國王在特奧蒂瓦卡的軍隊打敗他並殺害。（蒂卡爾是一個重要的瑪雅城市國家，而當時的特奧蒂瓦卡是美洲最大的城市，擁有近25萬居民 - 與當時的羅馬相當。）羅馬的失敗與特奧蒂瓦卡的崛起之間絕對沒有任何聯繫。羅馬可能就像位於火星上一樣，而特奧蒂瓦卡就像位於金星上一樣。

How many different human worlds coexisted on earth? Around 10.000 BC our planet contained many thousands of them. By 2000 BC , their numbers had dwindled to the hundreds, or at most a few thousand. By AD 1450, their numbers had declined even more drastically. At that time, just prior to the age of European exploration, earth still contained a significant number of dwarf worlds such as Tasmania. But close to 90 per cent of humans lived in a single mega-world: the world of Afro-Asia. Most of Asia, most of Europe, and most of Africa (including substantial chunks of sub-Saharan Africa) were already connected by significant cultural, political and economic ties.

Most of the remaining tenth of the world's human population was divided between four worlds of considerable size and complexity:

人類在地球上又有多少個不同的世界共存？在公元前10,000年左右我們的星球上有許多成千上萬的世界。到公元前2000年，它們的數量已經減少到數百個或最多幾千個。到公元1450年，它們的數量已經急劇下降。在那個時候，就在歐洲探險時代之前，地球仍然包含了大量的侏儒世界，例如塔斯馬尼亞。但接近90%的人類生活在單一巨型世界中：非洲-亞洲世界。亞洲的大部分，歐洲的大部分以及非洲的大部分（包括撒哈拉以南地區的大部分）已經通過重要的文化、政治和經濟聯繫而相互繫結。世界人口的其餘十分之一分布在四個相當大且複雜的世界中：

- 1 . The Mesoamerican World, which encompassed most of Central America and parts of North America.
- 2 . The Andean World, which encompassed most of western South America.
- 3 . The Australian World, which encompassed the continent of Australia.
- 4 . The Oceanic World, which encompassed most of the islands of the south-western Pacific Ocean, from Hawaii to New Zealand.

Over the next 300 years, the Afro-Asian giant swallowed up all the other worlds. It consumed the Mesoamerican World in 1521, when the Spanish conquered the Aztec Empire. It took its first bite out of the Oceanic World at the same time, during Ferdinand Magellan's circumnavigation of the globe, and soon after that completed its conquest. The Andean World collapsed in 1532, when Spanish conquistadors crushed the Inca Empire. The first European landed on the Australian continent in 1606, and that pristine world came to an end when British colonisation began in earnest in 1788. Fifteen years later the Britons established their first settlement in Tasmania, thus bringing the last autonomous human world into the Afro-Asian sphere of influence.

1. 中美洲大陸和北美洲的大部分地區所包含的中美洲世界。
2. 西南美洲的大部分地區所包含的安第斯世界。
3. 澳大利亞大陸所包含的澳洲

世界。4. 華夏世界中包含了大部分西南太平洋島嶼，從夏威夷到新西蘭。在接下來的300年中，非洲和亞洲的巨人吞噬了所有的其他世界。西班牙征服阿茲台克帝國於1521年消滅了中美洲世界。同時，費爾南多·麥哲倫環球航行期間，它在澳洲世界中完成了第一次掠食。隨著征服的完成，安第斯世界於1532年崩潰，當時西班牙征服了印加帝國。第一個抵達澳洲的歐洲人在1606年，而英國殖民化始於1788年而結束這個原始世界。15年後，英國人在塔斯馬尼亞建立了他們的第一個殖民地，進一步將最後一個自治人類社會帶入非洲和亞洲的影響範圍。

It took the Afro-Asian giant several centuries to digest all that it had swallowed, but the process was irreversible. Today almost all humans share the same geopolitical system (the entire planet is divided into internationally recognised states); the same economic system (capitalist market forces shape even the remotest corners of the globe); the same legal system (human rights and international law are valid everywhere, at least theoretically); and the same scientific system (experts in Iran, Israel, Australia and Argentina have exactly the same views about the structure of atoms or the treatment of tuberculosis).

The single global culture is not homogeneous. Just as a single organic body contains many different kinds of organs and cells, so our single global culture contains many different types of lifestyles and people, from New York stockbrokers to Afghan shepherds. Yet they are all closely connected and they influence one another in myriad ways. They still argue and fight, but they argue using the same concepts and fight using the same weapons. A real ‘clash of civilisations’ is like the proverbial dialogue of the deaf. Nobody can grasp what the other is saying. Today when Iran and the United States rattle swords at one another, they both speak the language of nation states, capitalist economies, international rights and nuclear physics.

非洲和亞洲的巨人花了數世紀的時間來消化它所吞噬的一切，但這個過程是不可逆轉的。今天，幾乎所有的人類都分享著相同的地緣政治體系（整個地球已經被劃分為國際公認的國家）、相同的經濟體系（資本主義市場力量塑造著全球最偏遠角落）、相同的法律體系（人權和國際法在理論上到處都有效）和相同的科學體系（伊朗、以色列、澳大利亞和阿根廷的專家們對原子結構或治療結核病的看法完全

相同）。單一的全球文化並不是同質化的。正如單一的有機體包含許多不同類型的器官和細胞一樣，我們的單一全球文化包含許多不同類型的生活方式和人，從紐約股票經紀人到阿富汗牧羊人。然而，他們都緊密相連，並以各種方式相互影響。他們仍然在爭論和戰鬥，但他們使用相同的概念爭論，使用相同的武器戰鬥。真正的「文明衝突」就像兩個聾子的對話。沒有人能夠理解對方在說什麼。今天，當伊朗和美國對峙時，他們都在使用國家體系、資本主義經濟、國際權利和核物理的語言。



Map 3. Earth in AD 1450. The named locations within the Afro-Asian World were places visited by the fourteenth-century Muslim traveller Ibn Battuta. A native of Tangier, in Morocco, Ibn Battuta visited Timbuktu, Zanzibar, southern Russia, Central Asia, India, China and Indonesia. His travels illustrate the unity of Afro-Asia on the eve of the modern era .

We still talk a lot about ‘authentic’ cultures, but if by ‘authentic’ we mean something that developed independently, and that consists of ancient local traditions free of external influences, then there are no authentic cultures left on earth. Over the last few centuries, all cultures were changed almost beyond recognition by a flood of global influences.

One of the most interesting examples of this globalisation is ‘ethnic’ cuisine. In an Italian restaurant we expect to find spaghetti in tomato sauce; in Polish

and Irish restaurants lots of potatoes; in an Argentinian restaurant we can choose between dozens of kinds of beefsteaks; in an Indian restaurant hot chillies are incorporated into just about everything; and the highlight at any Swiss café is thick hot chocolate under an alp of whipped cream. But none of these foods is native to those nations. Tomatoes, chilli peppers and cocoa are all Mexican in origin; they reached Europe and Asia only after the Spaniards conquered Mexico. Julius Caesar and Dante Alighieri never twirled tomato-drenched spaghetti on their forks (even forks hadn't been invented yet), William Tell never tasted chocolate, and Buddha never spiced up his food with chilli. Potatoes reached Poland and Ireland no more than 400 years ago. The only steak you could obtain in Argentina in 1492 was from a llama.

圖三：公元1450年的地球。阿非亞地區內的命名位置是十四世紀穆斯林旅行家伊本·白圖泰游覽過的地方。伊本·白圖泰原籍摩洛哥丹吉爾，曾到訪過廷巴克圖、桑給巴爾、南俄羅斯、中亞、印度、中國和印度尼西亞。他的旅行展示了現代之前阿非亞的統一。我們仍在大談“真正的”文化，但如果“真正的”是指發展獨立且由古老的本地傳統構成，且沒有外部影響，那麼地球上就沒有真正的文化了。在過去的幾個世紀中，所有文化都幾乎被全球影響改變了。這種全球化最有趣的例子之一是“種族”美食。在意大利餐廳，我們期望找到番茄醬意粉；在波蘭和愛爾蘭餐廳，有很多土豆；在阿根廷餐廳，我們可以選擇數十種牛排；在印度餐廳，熱辣椒被融入了幾乎所有菜餚中；在任何瑞士咖啡館的亮點是一杯濃郁的熱巧克力，配以堆高添瑞士奶油。但這些食物都不是這些國家的本土食物。番茄、辣椒和可可都是源自墨西哥；它們在西班牙人征服墨西哥之後才傳到歐洲和亞洲。朱利斯·凱撒和但丁·阿利吉耶裡從未用叉子旋轉沾滿番茄醬的意粉（即使當時還沒有發明叉子），威廉·特爾從未品嚐過巧克力，佛陀從未在食物中加入辣椒。土豆在不到400年前才傳到波蘭和愛爾蘭。1492年時在阿根廷從來只有羊駝肉可以吃。

Hollywood films have perpetuated an image of the Plains Indians as brave horsemen, courageously charging the wagons of European pioneers to protect the customs of their ancestors. However, these Native American horsemen were not the defenders of some ancient, authentic culture. Instead, they were the product of a major military and political revolution that swept the plains of western North America in the seventeenth and eighteenth centuries, a consequence of the arrival of European horses. In 1492 there were no horses

in America. The culture of the nineteenth-century Sioux and Apache has many appealing features, but it was a modern culture – a result of global forces – much more than authentic’.

The Global Vision

From a practical perspective, the most important stage in the process of global unification occurred in the last few centuries, when empires grew and trade intensified. Ever-tightening links were formed between the people of Afro-Asia, America, Australia and Oceania. Thus Mexican chilli peppers made it into Indian food and Spanish cattle began grazing in Argentina. Yet from an ideological perspective, an even more important development occurred during the first millennium BC , when the idea of a universal order took root. For thousands of years previously, history was already moving slowly in the direction of global unity, but the idea of a universal order governing the entire world was still alien to most people.

好萊塢電影將平原印第安人描繪成勇敢的騎馬者，勇敢地衝向歐洲拓荒者的馬車保護祖先的習俗。然而，這些印第安騎兵不是古老、真實文化的守護者。相反，他們是17和18世紀席捲西北美洲平原的一場重大的軍事和政治革命的產物，是歐洲馬匹到來的結果。1492年美洲沒有馬匹。19世紀的蘇族和阿帕奇文化有很多吸引人的特點，但它是一種現代文化——全球力量的結果——與真實的古老文化有很大不同。從實際的角度來看，全球統一進程中最重要的階段發生在最近幾個世紀，當時帝國崛起並且貿易日益密切。非洲亞洲、美洲、澳大利亞和大洋洲的人民之間形成了越來越緊密的聯繫。因此，墨西哥辣椒進入印度食物中，西班牙牛開始在阿根廷放牧。然而，從思想的角度來看，更重要的是發生在公元前一千年的一個發展，當時一個普遍秩序的想法扎根了。在此之前的數千年中，歷史已經緩慢地朝著全球統一的方向前進，但統治整個世界的普遍秩序的想法對大多數人來說仍然是陌生的。



25. Sioux chiefs (1905). Neither the Sioux nor any other Great Plains tribe had horses prior to 1492 .

Homo sapiens evolved to think of people as divided into us and them. ‘Us’ was the group immediately around you, whoever you were, and ‘them’ was everyone else. In fact, no social animal is ever guided by the interests of the entire species to which it belongs. No chimpanzee cares about the interests of the chimpanzee species, no snail will lift a tentacle for the global snail 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.

25. 蘇族酋長（1905年）。在1492年之前，蘇族和其他大平原部落均未有馬匹。智人進化使其開始將人分為「我們」和「他們」兩類。「我們」指的是你周圍的人群，而「他們」則是其他人群。實際上，沒有任何群居動物會引導整個物種的利益。黑猩猩不關心黑猩猩物種的利益，蝸牛也不會為全球蝸牛社群舉起觸角，獅子頭狼不會競爭成為所有獅子之王，蜂巢的入口處也找不到標語：「全球勞動蜜蜂 - 統一！」。但是從認知革命開始，智人在這方面變得越來越特殊。人們開始定期與完全陌生的人合作，將他們想象成「兄弟」或「朋友」。然而，這種兄弟關係並非普遍存在。在下個山谷或山脈的那端，人們仍然能感覺到「他們」。當第一位法老門斯於公元前3000年左右統一埃及時，那些埃及人知道埃及有邊界，在邊界之外潛伏著「野蠻人」。野蠻人是外來的、令人感到威脅的，只有在他們擁有埃及人想要的土地或自然資源時才顯得有趣。所有想象中的秩序都往往忽略了人類的一部分。

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.

公元前第一個千年見證了三種潛在的普世秩序的出現，其信徒首次可以想像整個世界和整個人類作為一個由一套法則統治的單一單位。每個人都是「我們」，至少是潛在的。不再有「他們」。第一個出現的普遍秩序是經濟秩序，即貨幣秩序。第二個普遍秩序是政治秩序，即帝國秩序。第三個普遍秩序是宗教秩序，即普遍宗教秩序，如佛教、基督教和伊斯蘭教。商人、征服者和先知是第一批成功超越"我們 vs 他們"二元進化分裂的人，並預見了人類可能的統一。對於商人來說，整個世界是一個單一的市場，所有人都是潛在的客戶。他們試圖建立一個適用於全球、適用於所有人的經濟秩序。對於征服者來說，整個世界是一個單一的帝國，所有人都是潛在的臣民，而對於先知來說，整個世界都包含一個單一的真理，所有人都是潛在的信徒。他們也試圖建立一個適用於每個人的秩序，並適用於全部地方。

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 foundation of the united world of today. We begin with the story of the greatest conqueror in history, a conqueror possessed of extreme tolerance and adaptability, thereby turning people into ardent disciples. This conqueror is money. People who do not believe in the same god or obey the same king are more than willing to use the same money. Osama Bin Laden, for all his hatred of American culture, American religion and American politics, was very fond of American dollars. How did money succeed where gods and kings failed?

在過去的三千年中，人們不斷嘗試實現全球願景。接下來的三章將討論貨幣、帝國和普世宗教的傳播，以及它們如何奠定了當今統一世界的基礎。我們從歷史上最偉大的征服者的故事開始，他是一位擁有極高寬容和適應性的征服者，從而將人們轉化為熱情的信徒。這位征服者是貨幣。即使不相信同一個神或遵從相同的國王，人們也很樂意使用同一種貨幣。奧薩瑪·本·拉登（Osama Bin Laden）儘管憎恨美國文化、美國宗教和美國政治，但卻非常喜歡美元。貨幣是如何成功而神和國王失敗的呢？

10

The Scent of Money

IN 1519 HERNÁN CORTÉS AND HIS CONQUISTADORS invaded Mexico, hitherto an isolated human world. The Aztecs, as the people who lived there called themselves, quickly noticed that the aliens showed an extraordinary interest in a certain yellow metal. In fact, they never seemed to stop talking about it. The natives were not unfamiliar with gold – it was pretty and easy to work, so they used it to make jewellery and statues, and they occasionally used gold dust as a medium of exchange. But when an Aztec wanted to buy something, he generally paid in cocoa beans or bolts of cloth. The Spanish obsession with gold thus seemed inexplicable. What was so important about a metal that could not be eaten, drunk or woven, and was too soft to use for tools or weapons? When the natives questioned Cortés as to why the Spaniards had such a passion for gold, the conquistador answered, ‘Because I and my companions suffer from a disease of the heart which can be cured only with gold.’¹

1519年，埃爾南·科爾特斯和他的征服者入侵了一個孤立的人類世界——墨西哥。這裡的人們稱自己為阿茲特克人，很快就注意到這些外來人對某種黃色金屬表現出了特別的興趣。事實上，他們似乎永遠停不下來談論這件事。當地人對金子並不陌生——金子漂亮且容易加工，因此他們用它製作首飾和雕像，偶爾也用金粉作為交換媒介。但是當一個阿茲特克人想買什麼東西時，他通常用可可豆或布匹來支付。因此，西班牙人對金子的著迷似乎是無法理解的。這種不能吃、不能喝、不能編織，而且太軟無法用於工具或武器的金屬有什麼重要性呢？當當地居民問及科爾特斯西班牙人對黃金如此熱衷的原因時，征服者回答道：“因為我和我的同伴患上了一種只能通過黃金治療的心靈疾病。”

In the Afro-Asian world from which the Spaniards came, the obsession for gold was indeed an epidemic. Even the bitterest of enemies lusted after the

same useless yellow metal. Three centuries before the conquest of Mexico, the ancestors of Cortés and his army waged a bloody war of religion against the Muslim kingdoms in Iberia and North Africa. The followers of Christ and the followers of Allah killed each other by the thousands, devastated fields and orchards, and turned prosperous cities into smouldering ruins – all for the greater glory of Christ or Allah.

As the Christians gradually gained the upper hand, they marked their victories not only by destroying mosques and building churches, but also by issuing new gold and silver coins bearing the sign of the cross and thanking God for His help in combating the infidels. Yet alongside the new currency, the victors minted another type of coin, called the *millares*, which carried a somewhat different message. These square coins made by the Christian conquerors were emblazoned with flowing Arabic script that declared: ‘There is no god except Allah, and Muhammad is Allah’s messenger.’ Even the Catholic bishops of Melgueil and Agde issued these faithful copies of popular Muslim coins, and God-fearing Christians happily used them.²

在西班牙人來自的非洲-亞洲世界，對黃金的痴迷確實像瘟疫般流行。即使是最為憎惡的敵人，也對同一份毫無用處的金屬垂涎三尺。在征服墨西哥之前三百年，科爾特斯和他的軍隊的祖先曾在伊比利亞半島和北非的穆斯林王國發起了一場有關宗教的血腥戰爭。基督的追隨者和阿拉的追隨者相互殺戮，毀滅了田野和果園，並將繁榮的城市變成了熏黑的廢墟-一切都是為了更偉大的基督或阿拉而奮鬥。當基督徒逐漸佔據優勢地位時，他們不僅慶祝勝利，摧毀清真寺，建立教堂，還發行了新的帶有十字架標記的金銀幣，並感謝上帝在抗擊異教徒方面所給予的幫助。然而，除了新貨幣外，勝利者還鑄造了另一種稱為 *millares* 的硬幣，它們傳達了稍微不同的信息。這些由基督征服者製造的方形硬幣上刻有流暢的阿拉伯文字，宣告著：“只有真主阿拉，穆罕默德是真主的使者。”甚至蒙古居伊和阿格德的天主教主教也發行了這些忠於信仰的穆斯林硬幣的副本，虔誠的基督徒們也很樂意使用它們。

Tolerance flourished on the other side of the hill too. Muslim merchants in North Africa conducted business using Christian coins such as the Florentine florin, the Venetian ducat and the Neapolitan gigliato. Even Muslim rulers

who called for jihad against the infidel Christians were glad to receive taxes in coins that invoked Christ and His Virgin Mother.³

How Much is It?

Hunter-gatherers had no money. Each band hunted, gathered and manufactured almost everything it required, from meat to medicine, from sandals to sorcery. Different band members may have specialised in different tasks, but they shared their goods and services through an economy of favours and obligations. A piece of meat given for free would carry with it the assumption of reciprocity – say, free medical assistance. The band was economically independent; only a few rare items that could not be found locally – seashells, pigments, obsidian and the like – had to be obtained from strangers. This could usually be done by simple barter: ‘We’ll give you pretty seashells, and you’ll give us high-quality flint.’

寬容在山的另一邊也蓬勃發展。北非的穆斯林商人使用基督教貨幣進行交易，如佛羅倫薩弗羅林、威尼斯的杜卡特和那不勒斯的吉列托。甚至那些號召聖戰對付不信者基督徒的穆斯林統治者，也很樂意收到以基督和他的母親瑪莉亞命名的硬幣付的稅款。狩獵採集者沒有貨幣。每個部落自給自足，狩獵、採集和製造幾乎所需的一切，從肉類到藥品，從拖鞋到巫術。不同的部落成員可能會專門從事不同的任務，但他們通過恩惠和義務的經濟方式分享他們的商品和服務。免費提供一塊肉，就會帶來互惠互利的假設——比如提供免費醫療協助。部落是經濟上獨立的；只有少數無法在當地找到的稀有物品——貝殼、顏料、黑曜石之類——必須從陌生人那裡獲得。這通常可以通過簡單的交換來完成：「我們給你漂亮的貝殼，你給我們高品質的燧石。」

Little of this changed with the onset of the Agricultural Revolution. Most people continued to live in small, intimate communities. Much like a hunter-gatherer band, each village was a self-sufficient economic unit, maintained by mutual favours and obligations plus a little barter with outsiders. One villager may have been particularly adept at making shoes, another at dispensing medical care, so villagers knew where to turn when barefoot or

sick. But villages were small and their economies limited, so there could be no full-time shoemakers and doctors.

The rise of cities and kingdoms and the improvement in transport infrastructure brought about new opportunities for specialisation. Densely populated cities provided full-time employment not just for professional shoemakers and doctors, but also for carpenters, priests, soldiers and lawyers. Villages that gained a reputation for producing really good wine, olive oil or ceramics discovered that it was worth their while to specialise nearly exclusively in that product and trade it with other settlements for all the other goods they needed. This made a lot of sense. Climates and soils differ, so why drink mediocre wine from your backyard if you can buy a smoother variety from a place whose soil and climate is much better suited to grape vines? If the clay in your backyard makes stronger and prettier pots, then you can make an exchange. Furthermore, full-time specialist vintners and potters, not to mention doctors and lawyers, can hone their expertise to the benefit of all. But specialisation created a problem – how do you manage the exchange of goods between the specialists?

農業革命開始後，大多數人繼續生活在小而親密的社區中，幾乎沒有改變。就像獵人採集團一樣，每個村莊都是一個自給自足的經濟單位，通過互惠和義務以及與外部的一些易貨交流維持運轉。一個村民可能善於制作鞋子，另一個可能擅長施行醫療，因此，當有人赤腳或生病時，村民知道該去哪裡尋求幫助。但是村莊規模小、經濟有限，因此沒有全職的鞋匠和醫生。城市和王國的興起以及交通基礎設施的改善帶來了新的專業化機會。人口密集的城市提供了全職就業機會，不僅對專業鞋匠和醫生，還對木匠、祭司、士兵和律師等提供了就業機會。那些以出產優質葡萄酒、橄欖油或陶瓷聞名的村莊發現，專門從事這種產品的生產幾乎是為了交換所需的其他商品。這非常有道理。氣候和土壤的不同，為什麼要喝你家後院的普通葡萄酒，而不是從土壤和氣候更適合葡萄種植的地方買更加柔和的品種呢？如果你後院的陶土能夠制作出更強更漂亮的陶器，那麼你就可以進行交換。此外，全職專門的葡萄酒製造商和陶匠，更不用說醫生和律師，可以專注於其專業知識，惠及大眾。但是專業化也帶來了一個問題——如何管理專家之間的商品交流？

An economy of favours and obligations doesn't work when large numbers of strangers try to cooperate. It's one thing to provide free assistance to a sister or a neighbour, a very different thing to take care of foreigners who might never reciprocate the favour. One can fall back on barter. But barter is effective only when exchanging a limited range of products. It cannot form the basis for a complex economy.⁴

In order to understand the limitations of barter, imagine that you own an apple orchard in the hill country that produces the crispest, sweetest apples in the entire province. You work so hard in your orchard that your shoes wear out. So you harness up your donkey cart and head to the market town down by the river. Your neighbour told you that a shoemaker on the south end of the marketplace made him a really sturdy pair of boots that's lasted him through five seasons. You find the shoemaker's shop and offer to barter some of your apples in exchange for the shoes you need.

當大量陌生人試圖合作時，一個交換「恩惠」和「義務」的經濟體制是不奏效的。對兄弟姐妹或鄰居提供免費援助是一回事，但照顧可能永遠不會回報恩惠的外國人則是完全不同的事情。人們可以借助物物交換的方式。但物物交換只在有限的產品交換方面是有效的，它不能成為複雜經濟的基礎。為了了解物物交換的限制，想像一下，如果你擁有一個生產全省最脆甜的蘋果的山區果園，你在果園裡工作得很辛苦，然後你的鞋子磨損了。所以你就驅使你的驢車前往河邊的市場鎮。你的鄰居告訴過你，在市場南端的一家鞋店裡，有個製鞋匠為他製作了一雙非常耐穿的靴子，可以穿五個季節。你找到了這家鞋店，並提議以一些蘋果來交換你所需要的鞋子。

The shoemaker hesitates. How many apples should he ask for in payment? Every day he encounters dozens of customers, a few of whom bring along sacks of apples, while others carry wheat, goats or cloth – all of varying quality. Still others offer their expertise in petitioning the king or curing backaches. The last time the shoemaker exchanged shoes for apples was three months ago, and back then he asked for three sacks of apples. Or was it four? But come to think of it, those apples were sour valley apples, rather than prime hill apples. On the other hand, on that previous occasion, the apples were given in exchange for small women's shoes. This fellow is asking for man-size boots. Besides, in recent weeks a disease has decimated

the flocks around town, and skins are becoming scarce. The tanners are starting to demand twice as many finished shoes in exchange for the same quantity of leather. Shouldn't that be taken into consideration?

鞋匠犹豫了一下。他应该要多少苹果作为报酬呢？他每天遇到数十个顾客，其中一些人带来了装满苹果的袋子，而其他人则带来了小麦、山羊或布料等各种物品，品质参差不齐。还有一些人提供了他们请求王宫或治疗背痛的专业知识。鞋匠上一次用鞋子换取苹果是三个月前，那时他要求三袋苹果。或者说是四袋？但是想一想，那些苹果是酸的谷地苹果，而不是优质的山顶苹果。另一方面，那时候，这些苹果是作为小女鞋的交换物。这家伙正在要求男式靴子。此外，最近几周，一个疾病已经摧毁了城镇周围的羊群，皮毛变得很稀缺。制革工人开始要求交换同样数量的皮革制成的鞋子加倍。这些情况不应该被考虑吗？

In a barter economy, every day the shoemaker and the apple grower will have to learn anew the relative prices of dozens of commodities. If one hundred different commodities are traded in the market, then buyers and sellers will have to know 4,950 different exchange rates. And if 1,000 different commodities are traded, buyers and sellers must juggle 499,500 different exchange rates! ⁵ How do you figure it out?

It gets worse. Even if you manage to calculate how many apples equal one pair of shoes, barter is not always possible. After all, a trade requires that each side want what the other has to offer. What happens if the shoemaker doesn't like apples and, if at the moment in question, what he really wants is a divorce? True, the farmer could look for a lawyer who likes apples and set up a three-way deal. But what if the lawyer is full up on apples but really needs a haircut?

在以物易物的經濟體系中，製鞋工和蘋果種植者每天都必須重新學習數十種商品的相對價格。如果市場上有一百種不同的商品進行交易，那麼買家和賣家就必須知道 4,950 種不同的匯率。如果有 1,000 種不同的商品進行交易，買家和賣家必須應對 499,500 種不同的匯率！你如何計算呢？情況可能會更糟。即使你成功地計算出一個蘋果等於一雙鞋，以物易物也並非總是可行的。畢竟，交易需要雙方都想要對方所提供的東西。如果製鞋工不喜歡蘋果，而且此時此刻他真正需要的是

離婚怎麼辦？當然，農夫可以尋找一位喜歡蘋果的律師並設立三方交易。但如果律師已經吃飽了蘋果，卻真的需要理髮呢？

Some societies tried to solve the problem by establishing a central barter system that collected products from specialist growers and manufacturers and distributed them to those who needed them. The largest and most famous such experiment was conducted in the Soviet Union, and it failed miserably. ‘Everyone would work according to their abilities, and receive according to their needs’ turned out in practice into ‘everyone would work as little as they can get away with, and receive as much as they could grab’. More moderate and more successful experiments were made on other occasions, for example in the Inca Empire. Yet most societies found a more easy way to connect large numbers of experts – they developed money.

Shells and Cigarettes

Money was created many times in many places. Its development required no technological breakthroughs – it was a purely mental revolution. It involved the creation of a new inter-subjective reality that exists solely in people’s shared imagination.

有些社會試圖通過建立中央物物交換系統來解決問題，該系統從專業種植者和製造商那裡收集產品，並將它們分配給需要它們的人。最大且最著名的實驗是在蘇聯進行的，但它卻慘遭失敗。“每個人都應該根據自己的能力工作，根據自己的需求獲得報酬”在實踐中變成了“每個人都盡可能少工作，盡可能多得到報酬”。在其他情況下進行了更穩健和成功的實驗，例如在印加帝國。然而，大多數社會發現了一種更簡單的方法來連接大量的專家-他們開始使用貨幣。貨幣已經在許多地方多次出現。它的發展並不需要技術突破-這是一場純粹的精神革命。它涉及創造一個僅存在於人們共同想象中的新的主觀現實。

Money is not coins and banknotes. Money is anything that people are willing to use in order to represent systematically the value of other things for the purpose of exchanging goods and services. Money enables people to compare quickly and easily the value of different commodities (such as apples, shoes and divorces), to easily exchange one thing for another, and to

store wealth conveniently. There have been many types of money. The most familiar is the coin, which is a standardised piece of imprinted metal. Yet money existed long before the invention of coinage, and cultures have prospered using other things as currency, such as shells, cattle, skins, salt, grain, beads, cloth and promissory notes. Cowry shells were used as money for about 4,000 years all over Africa, South Asia, East Asia and Oceania. Taxes could still be paid in cowry shells in British Uganda in the early twentieth century.

貨幣不只是硬幣和紙鈔，而是指人們願意使用的任何東西，以便系統地代表其他物品的價值，以便進行買賣商品和服務。貨幣使人們能夠快速輕鬆地比較不同商品的價值（如蘋果、鞋子和離婚），輕鬆地交換一物品為另一物品，並方便地儲存財富。曾經有許多種貨幣，最常見的是硬幣，是印上標準化圖案的金屬塊。但即使在硬幣發明之前也有貨幣的存在，各種文化曾使用其他東西作為貨幣，如貝殼、牛隻、皮革、鹽、谷物、珠子、布匹和本票。貝殼貨幣在非洲、南亞、東亞和大洋洲地區使用了約4000年之久，二十世紀初期英屬烏干達的稅款仍可使用貝殼貨幣支付。



worthy



to store



to sell



to buy



riches



treasure



to trade



reward



to barter



to demand payment

26. In ancient Chinese script the cowry-shell sign represented money, in words such as ‘to sell’ or ‘reward’ .

In modern prisons and POW camps, cigarettes have often served as money. Even non-smoking prisoners have been willing to accept cigarettes in payment, and to calculate the value of all other goods and services in cigarettes. One Auschwitz survivor described the cigarette currency used in the camp: ‘We had our own currency, whose value no one questioned: the cigarette. The price of every article was stated in cigarettes ... In “normal” times, that is, when the candidates to the gas chambers were coming in at a regular pace, a loaf of bread cost twelve cigarettes; a 300-gram package of margarine, thirty; a watch, eighty to 200; a litre of alcohol, 400 cigarettes!’ [6](#)

26. 在古代中國文字中，貝殼符號代表金錢，用於「賣出」或「獎勵」等詞語中。現代的監獄和戰俘營中，香煙常常被當作貨幣使用。即使是不抽煙的囚犯也願意接受香煙作為支付方式，並將其他商品和服務的價值計算為香煙。一位奧斯威辛集中營的倖存者描述了營中使用的香煙貨幣：「我們有自己的貨幣，沒有人會質疑它的價值：香煙。每件商品的價格都是用香煙來表示.....在『正常』的時候，也就是指每天上訴送進毒氣室的人數持續穩定的時候，一條麵包的價格是十二支香煙；一包300克的人造奶油是三十支香煙；手錶是八十到兩百支香煙；一升酒是四百支香煙！」

In fact, even today coins and banknotes are a rare form of money. In 2006, the sum total of money in the world is about \$60 trillion, yet the sum total of coins and banknotes was less than \$6 trillion.⁷ More than 90 per cent of all money – more than \$50 trillion appearing in our accounts – exists only on computer servers. Accordingly, most business transactions are executed by moving electronic data from one computer file to another, without any exchange of physical cash. Only a criminal buys a house, for example, by handing over a suitcase full of banknotes. As long as people are willing to trade goods and services in exchange for electronic data, it's even better than shiny coins and crisp banknotes – lighter, less bulky, and easier to keep track of.

For complex commercial systems to function, some kind of money is indispensable. A shoemaker in a money economy needs to know only the prices charged for various kinds of shoes – there is no need to memorise the exchange rates between shoes and apples or goats. Money also frees apple experts from the need to search out apple-craving shoemakers, because everyone always wants money. This is perhaps its most basic quality. Everyone always wants money because everyone else also always wants money, which means you can exchange money for whatever you want or need. The shoemaker will always be happy to take your money, because no matter what he really wants – apples, goats or a divorce – he can get it in exchange for money.

事實上，即使在今天，硬幣和紙幣也是一種罕見的貨幣形式。2006年，全球貨幣總額約為60萬億美元，但硬幣和紙幣的總額少於6萬億美元。超過90%的所有貨幣-超過我們帳戶中出現的50萬億美元以上-只

存在於計算機服務器上。因此，大多數商業交易是通過從一個計算機文件移動電子數據進行的，而沒有任何實體現金的交換。只有罪犯才會例如交付一個裝滿紙鈔的手提箱來購買房子。只要人們願意以電子數據交換商品和服務，那就比光亮的硬幣和新鮮的紙幣更好-更輕，更不占空間，更容易跟蹤。對於復雜的商業系統而言，某種形式的貨幣是必不可少的。在貨幣經濟中，鞋匠只需要知道各種鞋子收取的價格-不需要記住鞋子和蘋果或山羊之間的匯率。貨幣還使蘋果專家免於尋找渴望蘋果的鞋匠，因為每個人都總是想要錢。這可能是它最基本的品質。每個人都總是想要錢，因為其他人也總是想要錢，這意味著您可以用錢交換您想要或需要的任何東西。鞋匠總是樂意接受您的錢，因為無論他真正想要什麼-蘋果，山羊還是離婚-他都可以用錢來換取。

Money is thus a universal medium of exchange that enables people to convert almost everything into almost anything else. Brawn gets converted to brain when a discharged soldier finances his college tuition with his military benefits. Land gets converted into loyalty when a baron sells property to support his retainers. Health is converted to justice when a physician uses her fees to hire a lawyer – or bribe a judge. It is even possible to convert sex into salvation, as fifteenth-century prostitutes did when they slept with men for money, which they in turn used to buy indulgences from the Catholic Church.

Ideal types of money enable people not merely to turn one thing into another, but to store wealth as well. Many valuables cannot be stored – such as time or beauty. Some things can be stored only for a short time, such as strawberries. Other things are more durable, but take up a lot of space and require expensive facilities and care. Grain, for example, can be stored for years, but to do so you need to build huge storehouses and guard against rats, mould, water, fire and thieves. Money, whether paper, computer bits or cowry shells, solves these problems. Cowry shells don't rot, are unpalatable to rats, can survive fires and are compact enough to be locked up in a safe.

錢是一種普遍的交換媒介，使人們能夠將幾乎所有物品轉換成幾乎任何其他物品。當退役士兵利用他的軍事福利支付他的大學學費時，肌肉力量就轉變為智力；當男爵賣掉財產以支持他的部屬時，土地就轉變為忠誠；當一名醫生使用她的費用來雇用律師或賄賂法官時，健康

就轉變為正義。甚至可以將性轉化為救贖，就像十五世紀的妓女們進行的那樣，他們用錢和男人發生關係，然後再用這些錢從天主教會購買贖罪券。理想的貨幣類型不僅使人們能夠將一種物品轉化為另一種物品，而且還能儲存財富。許多貴重物品無法存儲，例如時間或美麗。有些東西只能短暫存放，例如草莓。其他物品更耐用，但佔用大量空間，需要昂貴的設施和護理。例如，穀物可以存儲多年，但要這樣做，您需要建造巨大的倉庫，防止老鼠、霉菌、水、火和小偷。無論是紙幣、計算機比特還是海螺貝殼，錢都能解決這些問題。海螺貝殼不會腐爛，對老鼠無味，能夠經受火災並且足夠小巧，可以鎖在保險箱裡。

In order to use wealth it is not enough just to store it. It often needs to be transported from place to place. Some forms of wealth, such as real estate, cannot be transported at all. Commodities such as wheat and rice can be transported only with difficulty. Imagine a wealthy farmer living in a moneyless land who emigrates to a distant province. His wealth consists mainly of his house and rice paddies. The farmer cannot take with him the house or the paddies. He might exchange them for tons of rice, but it would be very burdensome and expensive to transport all that rice. Money solves these problems. The farmer can sell his property in exchange for a sack of cowry shells, which he can easily carry wherever he goes.

Because money can convert, store and transport wealth easily and cheaply, it made a vital contribution to the appearance of complex commercial networks and dynamic markets. Without money, commercial networks and markets would have been doomed to remain very limited in their size, complexity and dynamism.

為了利用財富，僅僅儲存是不夠的，通常需要從一個地方運到另一個地方。像不動產這樣的財富無法運輸。像小麥和稻米這樣的商品運輸也很困難。想像一個住在沒有貨幣的土地上的富有農民，移居到一個遙遠的省份。他的財富主要是房屋和稻田。農民無法帶著房子或稻田走。他可能會用大量的稻米來交換，但是運輸所有的稻米將非常麻煩且昂貴。貨幣解決了這些問題。農民可以出售他的房產，換成一袋貝殼，他可以輕鬆地帶著它走到任何地方。因為貨幣能夠方便、便宜地轉換、儲存和運輸財富，它對於複雜商業網絡和動態市場的出現作出

了重要貢獻。如果沒有貨幣，商業網絡和市場只能在規模、複雜度和動態性方面非常有限，注定難以發展。

How Does Money Work?

Cowry shells and dollars have value only in our common imagination. Their worth is not inherent in the chemical structure of the shells and paper, or their colour, or their shape. In other words, money isn't a material reality – it is a psychological construct. It works by converting matter into mind. But why does it succeed? Why should anyone be willing to exchange a fertile rice paddy for a handful of useless cowry shells? Why are you willing to flip hamburgers, sell health insurance or babysit three obnoxious brats when all you get for your exertions is a few pieces of coloured paper?

People are willing to do such things when they trust the figments of their collective imagination. Trust is the raw material from which all types of money are minted. When a wealthy farmer sold his possessions for a sack of cowry shells and travelled with them to another province, he trusted that upon reaching his destination other people would be willing to sell him rice, houses and fields in exchange for the shells. Money is accordingly a system of mutual trust, and not just any system of mutual trust: *money is the most universal and most efficient system of mutual trust ever devised* .

珠貝與美元價值只存在於我們共同的想像中，它們的價值並不與殼和紙張的化學結構、色彩或形狀相關。換句話說，貨幣不是物質上的實體，而是心理上的建構。它的作用是將物質轉換成意識。但它為什麼能取得成功？為什麼有人會願意用一小把沒有用的珠貝交換一塊肥沃的稻田？為什麼你願意翻煎漢堡、賣保險或照顧三個惡劣的孩子，當你的努力只換來一些有色紙張？只有當人們相信集體想像中的虛構事物時，他們才願意做這樣的事情。信任是建立所有類型貨幣的原材料。當一個富有的農民用珠貝換取財產，並攜帶著這些珠貝前往另一個省份時，他相信到達目的地時，其他人會願意用這些珠貝換取米飯、房屋和田地。因此，貨幣是一個互信的系統，而且不僅是任何互信的系統：貨幣是有史以來最普遍和最高效的互信系統。

What created this trust was a very complex and long-term network of political, social and economic relations. Why do I believe in the cowry shell or gold coin or dollar bill? Because my neighbours believe in them. And my neighbours believe in them because I believe in them. And we all believe in them because our king believes in them and demands them in taxes, and because our priest believes in them and demands them in tithes. Take a dollar bill and look at it carefully. You will see that it is simply a colourful piece of paper with the signature of the US secretary of the treasury on one side, and the slogan 'In God We Trust' on the other. We accept the dollar in payment, because we trust in God and the US secretary of the treasury. The crucial role of trust explains why our financial systems are so tightly bound up with our political, social and ideological systems, why financial crises are often triggered by political developments, and why the stock market can rise or fall depending on the way traders feel on a particular morning.

這個信任的形成是建立在一個非常複雜且長期的政治、社會和經濟關係網絡之上。為什麼我相信貝殼、金幣或美元？因為我的鄰居相信它們。我的鄰居相信它們，因為我相信它們。因為我們所有人都相信它們，這是因為我們的國王相信它們並要求在稅收中使用，我們的祭司相信它們並要求在捐獻中使用。拿起一張美元紙幣，仔細看一看。你會發現它只是一張有著美國財政部長簽名的彩色紙張，另一面印有“我們信賴上帝”這句口號。我們接受美元作為支付方式，因為我們信任上帝和美國財政部長。信任的關鍵作用解釋了為什麼我們的金融系統與我們的政治、社會和意識形態系統密切相關，為什麼金融危機經常是由政治事件引發的，以及為什麼股市會因交易員在特定早晨的感覺而上漲或下跌。

Initially, when the first versions of money were created, people didn't have this sort of trust, so it was necessary to define as 'money' things that had real intrinsic value. History's first known money Sumerian barley money – is a good example. It appeared in Sumer around 3000 BC, at the same time and place, and under the same circumstances, in which writing appeared. Just as writing developed to answer the needs of intensifying administrative activities, so barley money developed to answer the needs of intensifying economic activities.

Barley money was simply barley – fixed amounts of barley grains used as a universal measure for evaluating and exchanging all other goods and services. The most common measurement was the sila, equivalent to roughly one litre. Standardised bowls, each capable of containing one sila, were mass-produced so that whenever people needed to buy or sell anything, it was easy to measure the necessary amounts of barley. Salaries, too, were set and paid in silas of barley. A male labourer earned sixty silas a month, a female labourer thirty silas. A foreman could earn between 1,200 and 5,000 silas. Not even the most ravenous foreman could eat 5,000 litres of barley a month, but he could use the silas he didn't eat to buy all sorts of other commodities – oil, goats, slaves, and something else to eat besides barley. [8](#)

最初，當貨幣的第一個版本被創造出來時，人們並沒有這種信任，所以有必要界定有真實內在價值的物品為“貨幣”。歷史上最早的錢是蘇美的大麥錢，它是一個很好的例子。它出現在蘇美約公元前3000年，與書寫在同一時間和地點，以及在同樣的情況下出現。就像書寫發展來回應不斷加劇的行政活動的需求一樣，大麥錢的發展是為了回應不斷加劇的經濟活動的需求。大麥錢就是大麥 - 固定量的大麥穀粒被用作評估和交換所有其他商品和服務的通用測量單位。最常見的計量單位是西拉，相當於大約一升。標準化的碗，每個碗可以容納一個西拉，被大量生產，以便每當人們需要買賣東西時，很容易測量所需的大麥量。工資也是以大麥的西拉為基準設定和支付的。男工人每月賺取六十個西拉，女工人每月賺取三十個西拉。工頭可以賺取1200到5000個西拉。即使是最貪婪的工頭也不能每月吃5000升的大麥，但他可以使用他沒有吃掉的西拉購買各種其他商品 - 油、山羊、奴隸和除大麥以外的其他食物。

Even though barley has intrinsic value, it was not easy to convince people to use it as *money* rather than as just another commodity. In order to understand why, just think what would happen if you took a sack full of barley to your local shopping centre, and tried to buy a shirt or a pizza. The vendors would probably call security. Still, it was somewhat easier to build trust in barley as the first type of money, because barley has an inherent biological value. Humans can eat it. On the other hand, it was difficult to store and transport barley. The real breakthrough in monetary history occurred when people gained trust in money that lacked inherent value, but was easier to store and

transport. Such money appeared in ancient Mesopotamia in the middle of the third millennium BC . This was the silver shekel.

儘管大麥有其內在價值，但要說服人們將其用作貨幣而非其他商品並不容易。為了理解為什麼，想像一下如果你拿著一袋大麥去當地購物中心買襯衫或披薩會發生什麼。商販可能會報警。儘管如此，讓大麥成為第一種貨幣還是比較容易建立信任，因為大麥具有生物學的內在價值。人類可以食用它。然而，存儲和運輸大麥卻是困難的。貨幣史上的真正突破是當人們開始信任沒有內在價值但更易存儲和運輸的貨幣時。這種貨幣出現在公元前三千年中葉的古代美索不達米亞。這就是銀錢。

The silver shekel was not a coin, but rather 8.33 grams of silver. When Hammurabi's Code declared that a superior man who killed a slave woman must pay her owner twenty silver shekels, it meant that he had to pay 166 grams of silver, not twenty coins. Most monetary terms in the Old Testament are given in terms of silver rather than coins. Josephs brothers sold him to the Ishmaelites for twenty silver shekels, or rather 166 grams of silver (the same price as a slave woman – he was a youth, after all).

Unlike the barley sila, the silver shekel had no inherent value. You cannot eat, drink or clothe yourself in silver, and it's too soft for making useful tools – ploughshares or swords of silver would crumple almost as fast as ones made out of aluminium foil. When they are used for anything, silver and gold are made into jewellery, crowns and other status symbols – luxury goods that members of a particular culture identify with high social status. Their value is purely cultural.

銀謝客爲8.33克銀，並非硬幣。當哈姆拉比法典宣稱某位高尚男子殺害了一位奴隸女性，必須支付20個銀謝客的所有人時，意味著他必須支付166克銀，而非20枚硬幣。舊約聖經中的大多數貨幣術語都是以銀為基礎，而不是以硬幣為基礎。約瑟的兄弟們以20個銀謝客（166克銀）的價格將他出售給以實瑪利人（畢竟他是個年輕人）。與大麥的裡斯拉不同，銀謝客沒有固有價值。您無法食用，飲用或以銀製成衣服，並且銀製具有軟度使其無法製作實用工具 - 用銀製成的犁頭或劍會幾乎和鋁箔製成的產品一樣迅速地變形。當它們用於任何事情

時，銀和金都被製成珠寶，冠冕和其他象徵高社會地位的奢侈品 - 其價值純粹是文化上的。

Set weights of precious metals eventually gave birth to coins. The first coins in history were struck around 640 BC by King Alyattes of Lydia, in western Anatolia. These coins had a standardised weight of gold or silver, and were imprinted with an identification mark. The mark testified to two things. First, it indicated how much precious metal the coin contained. Second, it identified the authority that issued the coin and that guaranteed its contents. Almost all coins in use today are descendants of the Lydian coins.

Coin had two important advantages over unmarked metal ingots. First, the latter had to be weighed for every transaction. Second, weighing the ingot is not enough. How does the shoemaker know that the silver ingot I put down for my boots is really made of pure silver, and not of lead covered on the outside by a thin silver coating? Coins help solve these problems. The mark imprinted on them testifies to their exact value, so the shoemaker doesn't have to keep a scale on his cash register. More importantly, the mark on the coin is the signature of some political authority that guarantees the coin's value.

貴重金屬的重量標準，最終孕育出硬幣。歷史上第一批硬幣於公元前640年在安那托利亞西部的利迪亞國王阿里亞特斯所鑄造。這些硬幣有標準化的黃金或白銀重量，並刻有識別標記。標記證明了兩件事：首先，它表明硬幣包含多少貴重金屬。其次，它識別了發行硬幣並保證其含量的政府機關。今天幾乎所有使用的硬幣都是利迪亞硬幣的後代。硬幣比無標記的金屬錠具有兩個重要優勢。首先，後者需要為每一筆交易進行稱重。其次，只稱重錠就不夠了。鞋匠如何知道我為我的靴子放下的銀錠真的是純銀，而不是外面被薄銀覆蓋的鉛？硬幣有助於解決這些問題。刻印在硬幣上的標記證明了它們的精確價值，因此鞋匠不必在他的收銀機上放置一個秤。更重要的是，硬幣上的標記是某個政府機構的簽名，保證硬幣的價值。

The shape and size of the mark varied tremendously throughout history, but the message was always the same: 'I, the Great King So-And-So, give you my personal word that this metal disc contains exactly five grams of gold. If anyone dares counterfeit this coin, it means he is fabricating my own

signature, which would be a blot on my reputation. I will punish such a crime with the utmost severity.' That's why counterfeiting money has always been considered a much more serious crime than other acts of deception.

Counterfeiting is not just cheating – it's a breach of sovereignty, an act of subversion against the power, privileges and person of the king. The legal term is *lese-majesty* (violating majesty), and was typically punished by torture and death. As long as people trusted the power and integrity of the king, they trusted his coins. Total strangers could easily agree on the worth of a Roman denarius coin, because they trusted the power and integrity of the Roman emperor, whose name and picture adorned it.

標誌的形狀和大小在歷史上有很大的變化，但其信息始終相同：“我，偉大的國王某某，向您保證此金屬圓盤確切含有五克金。如果有人冒充這個硬幣，等於是偽造了我的簽名，這會損害我的聲譽。我將以最嚴厲的懲罰來懲治這種罪行。”這就是為什麼偽造貨幣一直被視為比其他欺詐行為更為嚴重的罪行。偽造不僅僅是欺騙，更是對國王的主權、權利和人格的顛覆行為。法律術語是"*lese-majesty*"（侵犯威嚴），通常受到酷刑和死刑的懲罰。只要人們相信國王的權力和誠信，他們就相信他的硬幣。完全陌生的人也可以輕易地同意一枚羅馬十字硬幣的價值，因為他們相信裝飾著名字和肖像的羅馬皇帝的權力和誠信。



27. One of the earliest coins in history, from Lydia of the seventh century BC .

In turn, the power of the emperor rested on the denarius. Just think how difficult it would have been to maintain the Roman Empire without coins – if

the emperor had to raise taxes and pay salaries in barley and wheat. It would have been impossible to collect barley taxes in Syria, transport the funds to the central treasury in Rome, and transport them again to Britain in order to pay the legions there. It would have been equally difficult to maintain the empire if the inhabitants of the city of Rome believed in gold coins, but the subject populations rejected this belief, putting their trust instead in cowry shells, ivory beads or rolls of cloth.

The Gospel of Gold

The trust in Rome's coins was so strong that even outside the empire's borders, people were happy to receive payment in denarii. In the first century AD, Roman coins were an accepted medium of exchange in the markets of India, even though the closest Roman legion was thousands of kilometres away. The Indians had such a strong confidence in the denarius and the image of the emperor that when local rulers struck coins of their own they closely imitated the denarius, down to the portrait of the Roman emperor! The name 'denarius' became a generic name for coins. Muslim caliphs Arabicised this name and issued 'dinars'. The dinar is still the official name of the currency in Jordan, Iraq, Serbia, Macedonia, Tunisia and several other countries.

27. 在七世紀前的里底亞，是歷史上最早的硬幣之一。反過來，羅馬帝國皇帝的權力基礎建立於“丹納里斯”硬幣。仔細想想，如果皇帝必須以大麥和小麥支付稅款和薪金，那麼維持羅馬帝國將會有多困難。收集敘利亞大麥稅款，將資金運輸至羅馬的中央庫房，再將其運輸至英國以支付駐軍，這將是不可能的。同樣地，如果羅馬市的居民相信金幣，但其他地區之居民卻信奉貝殼、象牙珠或布匹捲卷，那麼維持帝國也同樣困難。羅馬硬幣得到如此的信任，以至於甚至在帝國邊緣地區，人們也願意以丹納里斯硬幣接受付款。公元一世紀，即使最近的羅馬軍團距離印度數千公里，羅馬硬幣在印度市場上仍被視為一種可接受的交換媒介。印度人對丹納里斯和羅馬皇帝的形象有如此強烈的信心，以至於當地統治者自鑄硬幣時，他們也非常模仿羅馬的丹納里斯，甚至包括羅馬皇帝的畫像在內的細節！“丹納里斯”成為了代表硬幣的通用名稱。穆斯林哈里發們也將其阿拉伯化，並發行了“丹納爾”硬幣。直到今日，“丹納爾”仍是約旦、伊拉克、塞爾維亞、北馬其頓、突尼斯等國家的官方貨幣名稱。

As Lydian-style coinage was spreading from the Mediterranean to the Indian Ocean, China developed a slightly different monetary system, based on bronze coins and unmarked silver and gold ingots. Yet the two monetary systems had enough in common (especially the reliance on gold and silver) that close monetary and commercial relations were established between the Chinese zone and the Lydian zone. Muslim and European merchants and conquerors gradually spread the Lydian system and the gospel of gold to the far corners of the earth. By the late modern era the entire world was a single monetary zone, relying first on gold and silver, and later on a few trusted currencies such as the British pound and the American dollar.

The appearance of a single transnational and transcultural monetary zone laid the foundation for the unification of Afro-Asia, and eventually of the entire globe, into a single economic and political sphere. People continued to speak mutually incomprehensible languages, obey different rulers and worship distinct gods, but all believed in gold and silver and in gold and silver coins. Without this shared belief, global trading networks would have been virtually impossible. The gold and silver that sixteenth-century conquistadors found in America enabled European merchants to buy silk, porcelain and spices in East Asia, thereby moving the wheels of economic growth in both Europe and East Asia. Most of the gold and silver mined in Mexico and the Andes slipped through European fingers to find a welcome home in the purses of Chinese silk and porcelain manufacturers. What would have happened to the global economy if the Chinese hadn't suffered from the same 'disease of the heart' that afflicted Cortés and his companions – and had refused to accept payment in gold and silver?

隨著利底亞風格的貨幣從地中海擴展到印度洋，中國開發了一種稍有不同的貨幣系統，基於青銅錢和未加標誌的銀金錠。然而，這兩種貨幣系統有足夠的共同之處（特別是對黃金和白銀的依賴），從而建立了中國地區和利底亞地區之間的緊密貨幣和商業關係。穆斯林和歐洲商人和征服者逐漸傳播了利底亞系統和黃金的福音到地球的最遠角落。到了現代晚期，整個世界成為了一個單一的貨幣區域，最初依靠黃金和白銀，後來依靠少數可靠的貨幣，如英鎊和美元。單一的跨國和跨文化貨幣區域的出現為非洲-亞洲的統一，最終為整個地球進入單一的經濟和政治領域奠定了基礎。人們繼續講著互相不理解的語言，順從不同的統治者，並崇拜不同的神，但所有人都相信黃金和白銀以

及黃金和白銀的硬幣。如果沒有這種共同的信仰，全球貿易網絡幾乎是不可能的。十六世紀征服者在美洲發現的黃金和白銀使得歐洲商人能夠在東亞購買絲綢、瓷器和香料，從而在歐洲和東亞推動了經濟增長的輪子。在墨西哥和安第斯挖掘出的大部分黃金和白銀都滑到了歐洲人的手中，找到了中國的絲綢和瓷器製造商的歡迎之家。如果中國人沒有像科爾特斯和他的同伴一樣受到“心臟病”的折磨 - 並且拒絕以黃金和白銀支付，全球經濟會發生什麼情況？

Yet why should Chinese, Indians, Muslims and Spaniards – who belonged to very different cultures that failed to agree about much of anything – nevertheless share the belief in gold? Why didn't it happen that Spaniards believed in gold, while Muslims believed in barley, Indians in cowry shells, and Chinese in rolls of silk? Economists have a ready answer. Once trade connects two areas, the forces of supply and demand tend to equalise the prices of transportable goods. In order to understand why, consider a hypothetical case. Assume that when regular trade opened between India and the Mediterranean, Indians were uninterested in gold, so it was almost worthless. But in the Mediterranean, gold was a coveted status symbol, hence its value was high. What would happen next?

然而，為什麼中國人、印度人、穆斯林和西班牙人——這些屬於文化差異極大、在許多事情上無法達成共識的人們——會共同相信金子呢？為什麼不是西班牙人相信金子，穆斯林相信大麥，印度人相信貝殼，中國人相信絲綢呢？經濟學家們有一個即備的答案。一旦貿易連接了兩個地區，供求的力量就會使可運輸商品的價格趨於平等。為了理解這一點，我們考慮一個假設的情況。假設當印度和地中海之間的常規貿易開始時，印度人對金子不感興趣，因此金子幾乎毫無價值。但在地中海，金子是一種令人垂涎的地位象徵，因此其價值很高。接下來會發生什麼呢？

Merchants travelling between India and the Mediterranean would notice the difference in the value of gold. In order to make a profit, they would buy gold cheaply in India and sell it dearly in the Mediterranean. Consequently, the demand for gold in India would skyrocket, as would its value. At the same time the Mediterranean would experience an influx of gold, whose value would consequently drop. Within a short time the value of gold in India and the Mediterranean would be quite similar. The mere fact that Mediterranean

people believed in gold would cause Indians to start believing in it as well. Even if Indians still had no real use for gold, the fact that Mediterranean people wanted it would be enough to make the Indians value it.

Similarly, the fact that another person believes in cowry shells, or dollars, or electronic data, is enough to strengthen our own belief in them, even if that person is otherwise hated, despised or ridiculed by us. Christians and Muslims who could not agree on religious beliefs could nevertheless agree on a monetary belief, because whereas religion asks us to believe in something, money asks us to believe that *other people believe in something*.

印度和地中海之間的商人們會注意到黃金價值的差異。為了賺錢，他們會在印度以便宜的價格買進黃金，再在地中海以高價賣出。因此，印度的黃金需求急劇增加，價值也相應提高。同時，地中海地區會有大量的黃金湧入，其價值將因此下跌。在短時間內，印度和地中海的黃金價值會變得非常相似。地中海人民相信黃金的事實，會讓印度人也開始相信它。即使印度人仍然沒有真正用途的黃金，地中海人民想要它的事實就足以讓印度人重視它。同樣地，即使我們憎恨、輕視或嘲笑某個人，如果他相信貝殼、美元或電子數據，這也足以增強我們對它們的信仰。即使基督教徒和穆斯林在宗教信仰上無法達成共識，但他們仍然可以對貨幣信仰達成共識，因為宗教要求我們相信某些事情，而金錢要求我們相信別人相信某些事情。

For thousands of years, philosophers, thinkers and prophets have besmirched money and called it the root of all evil. Be that as it may, money is also the apogee of human tolerance. Money is more open-minded than language, state laws, cultural codes, religious beliefs and social habits. Money is the only trust system created by humans that can bridge almost any cultural gap, and that does not discriminate on the basis of religion, gender, race, age or sexual orientation. Thanks to money, even people who don't know each other and don't trust each other can nevertheless cooperate effectively.

The Price of Money

Money is based on two universal principles:

- a. Universal convertibility: with money as an alchemist, you can turn land into loyalty, justice into health, and violence into knowledge.

數千年來，哲學家、思想家和先知們貶低金錢並稱其為萬惡之源。儘管如此，金錢也是人類包容力的最高峰。金錢比語言、國家法律、文化代碼、宗教信仰和社會習慣更具開放性。金錢是人類創造的唯一信任系統，可彌合幾乎所有文化差距，並不會因宗教、性別、種族、年齡或性取向而歧視。由於金錢的存在，即使是彼此不認識、互相不信任的人也可以有效地合作。金錢基於兩個普世原則：a.普遍可轉換性：通過金錢這種煉金術，您可以將土地變成忠誠，將正義變成健康，並將暴力轉化為知識。

- b. Universal trust: with money as a go-between, any two people can cooperate on any project.

These principles have enabled millions of strangers to cooperate effectively in trade and industry. But these seemingly benign principles have a dark side. When everything is convertible, and when trust depends on anonymous coins and cowry shells, it corrodes local traditions, intimate relations and human values, replacing them with the cold laws of supply and demand.

Human communities and families have always been based on belief in ‘priceless’ things, such as honour, loyalty, morality and love. These things lie outside the domain of the market, and they shouldn’t be bought or sold for money. Even if the market offers a good price, certain things just aren’t done. Parents mustn’t sell their children into slavery; a devout Christian must not commit a mortal sin; a loyal knight must never betray his lord; and ancestral tribal lands shall never be sold to foreigners.

- b. 普遍信任：凭借金钱作为媒介，任何两个人都可以在任何项目上合作。这些原则使数百万陌生人能够有效地合作进行贸易和工业活动。但是，这些表面上温和的原则也有一个黑暗的一面。当一切都可以兑换，当信任取决于匿名的硬币和贝壳时，它腐蚀了当地的传统、亲密关系和人类价值观，用供需的冷酷法则替代了它们。人类社区和家庭始终基于对“无价之物”的信仰，如荣誉、忠诚、道德和爱。这些事情超出了市场的范畴，它们不应该为金钱而买卖。即使市场提供了一个好的价格，某些事情也不能做。父母不能把他们的孩子卖到奴隶制度

中；虔诚的基督徒不能犯致命的罪；忠诚的骑士绝不能背叛他的主人；祖传的部落土地不能卖给外国人。

Money has always tried to break through these barriers, like water seeping through cracks in a dam. Parents have been reduced to selling some of their children into slavery in order to buy food for the others. Devout Christians have murdered, stolen and cheated – and later used their spoils to buy forgiveness from the church. Ambitious knights auctioned their allegiance to the highest bidder, while securing the loyalty of their own followers by cash payments. Tribal lands were sold to foreigners from the other side of the world in order to purchase an entry ticket into the global economy.

Money has an even darker side. For although money builds universal trust between strangers, this trust is invested not in humans, communities or sacred values, but in money itself and in the impersonal systems that back it. We do not trust the stranger, or the next-door neighbour – we trust the coin they hold. If they run out of coins, we run out of trust. As money brings down the dams of community, religion and state, the world is in danger of becoming one big and rather heartless marketplace.

金錢一直試圖突破這些障礙，就像水滲透堤壩裂縫一樣。父母為了讓其他孩子有食物而被迫賣掉其中一些孩子作為奴隸。虔誠的基督徒曾經殺人搶劫，並後來用贓物買回教堂的寬恕。野心勃勃的騎士會把效忠賣給出價最高的人，同時通過現金支付來確保其追隨者的忠誠。部落土地被出售給來自世界另一端的外國人，以便購買進入全球經濟的入場券。金錢甚至還有更黑暗的一面。儘管金錢在陌生人之間建立了普遍的信任，但這種信任不是投資於人類、社區或神聖價值觀中，而是投資於金錢自身和支撐它的非人性系統中。我們不信任陌生人或鄰居，我們信任他們手中的硬幣。如果他們沒有硬幣了，我們也失去了信任。隨著金錢摧毀社區、宗教和國家的壩壠，世界正面臨變成一個巨大而冷酷的市場的危險。

Hence the economic history of humankind is a delicate dance. People rely on money to facilitate cooperation with strangers, but they're afraid it will corrupt human values and intimate relations. With one hand people willingly destroy the communal dams that held at bay the movement of money and

commerce for so long. Yet with the other hand they build new dams to protect society, religion and the environment from enslavement to market forces.

It is common nowadays to believe that the market always prevails, and that the dams erected by kings, priests and communities cannot long hold back the tides of money. This is naïve. Brutal warriors, religious fanatics and concerned citizens have repeatedly managed to trounce calculating merchants, and even to reshape the economy. It is therefore impossible to understand the unification of humankind as a purely economic process. In order to understand how thousands of isolated cultures coalesced over time to form the global village of today, we must take into account the role of gold and silver, but we cannot disregard the equally crucial role of steel.

因此，人類的經濟史就像一場微妙的舞蹈。人們依賴金錢來促進與陌生人的合作，但他們也害怕它會腐敗人類的價值和私密關係。一手，人們 willingly 拆除了擋住金錢和商業流動的公共水壩。然而，另一方面，他們建造新的水壩來保護社會、宗教和環境不受市場力量奴役。現在普遍認為市場總是佔上風，而國王、祭司和社群所建立的水壩不能長期阻止金錢浪潮的侵蝕。這種觀點是天真的。殘酷的戰士、宗教狂熱分子和關注公民再三擊敗了計算商人，甚至重新塑造了經濟。因此，要理解人類統一為純經濟過程是不可能的。為了理解成千上萬個孤立文化如何隨著時間的推移凝聚成今天的全球村莊，我們必須考慮黃金和白銀的作用，但我們也不能忽視鋼鐵同樣至關重要的作用。

II

Imperial Visions

THE ANCIENT ROMANS WERE USED TO being defeated. Like the rulers of most of history's great empires, they could lose battle after battle but still win the war. An empire that cannot sustain a blow and remain standing is not really an empire. Yet even the Romans found it hard to stomach the news arriving from northern Iberia in the middle of the second century BC . A small, insignificant mountain town called Numantia, inhabited by the peninsula's native Celts, had dared to throw off the Roman yoke. Rome at the time was the unquestioned master of the entire Mediterranean basin, having vanquished the Macedonian and Seleucid empires, subjugated the proud city states of Greece, and turned Carthage into a smouldering ruin. The Numantians had nothing on their side but their fierce love of freedom and their inhospitable terrain. Yet they forced legion after legion to surrender or retreat in shame.

古羅馬人習慣了失敗。像歷史上大部分帝國的統治者一樣，他們可以失去一次次的戰役，卻仍贏得了戰爭。一個不能承受打擊而繼續屹立的帝國，並不是真正的帝國。然而，即使對古羅馬人來說，從公元前二世紀中期傳來的來自伊比利亞半島北部的消息也令人難以接受。一個叫做諾曼蒂亞的無足輕重的山城，由當地凱爾特人居住，竟然敢於擺脫了羅馬的鎖鏈。當時的羅馬是地中海盆地的無可爭辯的主宰，曾征服了馬其頓和塞琉古帝國，臣服了希臘的驕傲城邦，並把迦太基變成了一座冒煙的廢墟。諾曼蒂亞人除了熾烈的自由之愛和荒涼的地形外，毫無優勢。然而，他們強迫著一個又一個的軍團屈服或羞辱地撤退。

Eventually, in 134 BC , Roman patience snapped. The Senate decided to send Scipio Aemilianus, Rome's foremost general and the man who had levelled Carthage, to take care of the Numantians. He was given a massive army of more than 30,000 soldiers. Scipio, who respected the fighting spirit

and martial skill of the Numantians, preferred not to waste his soldiers in unnecessary combat. Instead, he encircled Numantia with a line of fortifications, blocking the town's contact with the outside world. Hunger did his work for him. After more than a year, the food supply ran out. When the Numantians realised that all hope was lost, they burned down their town; according to Roman accounts, most of them killed themselves so as not to become Roman slaves.

Numantia later became a symbol of Spanish independence and courage. Miguel de Cervantes, the author of *Don Quixote*, wrote a tragedy called *The Siege of Numantia* which ends with the town's destruction, but also with a vision of Spain's future greatness. Poets composed paeans to its fierce defenders and painters committed majestic depictions of the siege to canvas. In 1882, its ruins were declared a national monument¹ and became a pilgrimage site for Spanish patriots. In the 1950s and 1960s, the most popular comic books in Spain weren't about Superman and Spiderman – they told of the adventures of El Jabato, an imaginary ancient Iberian hero who fought against the Roman oppressors. The ancient Numantians are to this day Spain's paragons of heroism and patriotism, cast as role models for the country's young people.

最終，公元前134年，羅馬人的耐心崩潰了。參議院決定派遣斯基比奧·埃米利亞努斯，羅馬最傑出的將領，也是摧毀迦太基的人，來對付努曼提亞人。他獲得了超過3萬名士兵的龐大部隊。斯基比奧尊重努曼提亞人的戰鬥精神和武藝，不願浪費他的士兵在不必要的戰鬥中。相反地，他用一系列的工事環繞努曼提亞，封鎖了該城與外界的聯繫。飢餓為他做了選擇。一年多後，糧食供應用盡了。當努曼提亞人意識到一切希望都已喪失時，他們燒毀了他們的城鎮；根據羅馬的記載，他們中的大多數自殺，以免成為羅馬的奴隸。努曼提亞後來成為西班牙獨立和勇氣的象徵。唐·基哈蒂的作者米格爾·德·塞萬提斯寫了一部悲劇，名為《努曼提亞的圍城》，劇終結於城市的毀滅，但也展示了西班牙未來的偉大之處。詩人們讚美其兇猛的防禦者，畫家們在畫布上描繪了壯麗的圍城畫。1882年，它的廢墟被宣布為國家級紀念碑，成為西班牙愛國者的朝聖地。在1950年代和1960年代，西班牙最受歡迎的漫畫不是有關超人和蜘蛛人的，而是描述虛構的古伊比利亞英雄埃爾哈巴托對抗羅馬壓迫者的冒險。古代努曼提亞人至今仍是西班牙英雄主義和愛國主義的模範，作為該國年輕人的榜樣。

Yet Spanish patriots extol the Numantians in *Spanish* – a romance language that is a progeny of Scipio’s Latin. The Numantians spoke a now dead and lost Celtic language. Cervantes wrote *The Siege of Numantia* in Latin script, and the play follows Graeco-Roman artistic models. Numantia had no theatres. Spanish patriots who admire Numantine heroism tend also to be loyal followers of the Roman Catholic Church – don’t miss that first word – a church whose leader still sits in Rome and whose God prefers to be addressed in Latin. Similarly, modern Spanish law derives from Roman law; Spanish politics is built on Roman foundations; and Spanish cuisine and architecture owe a far greater debt to Roman legacies than to those of the Celts of Iberia. Nothing is really left of Numantia save ruins. Even its story has reached us thanks only to the writings of Roman historians. It was tailored to the tastes of Roman audiences which relished tales of freedom-loving barbarians. The victory of Rome over Numantia was so complete that the victors co-opted the very memory of the vanquished.

然而，西班牙的爱国者却在西班牙语中称颂纽曼提亚人，这是斯西庇厄拉丁语的后代。纽曼提亚人讲的是一种现在已经死亡和失落的凯尔特语言。塞万提斯用拉丁文写了《纽曼提亚的围攻》，这个剧本遵循希腊罗马的艺术模式。纽曼提亚没有剧院。钦佩纽曼提亚英雄主义的西班牙爱国者也倾向于忠诚于罗马天主教会——不要错过那个第一个单词——这个教会的领袖仍然坐落在罗马，他的上帝更喜欢用拉丁语称呼。同样，现代西班牙法律源自罗马法律；西班牙政治建立在罗马基础之上；而西班牙美食和建筑更是欠罗马遗产的极大负债，而不是伊比利亚凯尔特人的遗产。纽曼提亚没有留下什么，只剩下废墟。即使是它的故事也仅通过罗马历史学家的著作传达给我们。它是为罗马观众量身打造的，这些观众喜欢自由爱好的野蛮人的故事。罗马对纽曼提亚的胜利是如此完美，以至于胜利者占用了被征服的记忆。

It’s not our kind of story. We like to see underdogs win. But there is no justice in history. Most past cultures have sooner or later fallen prey to the armies of some ruthless empire, which have consigned them to oblivion. Empires, too, ultimately fall, but they tend to leave behind rich and enduring legacies. Almost all people in the twenty-first century are the offspring of one empire or another.

What is an Empire?

An empire is a political order with two important characteristics. First, to qualify for that designation you have to rule over a significant number of distinct peoples, each possessing a different cultural identity and a separate territory. How many peoples exactly? Two or three is not sufficient. Twenty or thirty is plenty. The imperial threshold passes somewhere in between.

這並不是我們喜愛的故事。我們喜歡看到弱者勝利，但歷史上並不存在正義。大多數的過去文化都早晚淪為某些無情帝國的軍隊所掠奪，被遺忘於時光中。帝國也會最終崩潰，但卻常常留下豐富且永恆的遺產。二十一世紀的幾乎所有人都是某個帝國的後代。帝國是一種具有兩個重要特徵的政治秩序。首先，為了符合這種稱號，你必須掌握大量不同文化身份和分開領土的民族。具體多少民族？兩個或三個不夠，而二十或三十則足夠。帝國的門檻在其間。

Second, empires are characterised by flexible borders and a potentially unlimited appetite. They can swallow and digest more and more nations and territories without altering their basic structure or identity. The British state of today has fairly clear borders that cannot be exceeded without altering the fundamental structure and identity of the state. A century ago almost any place on earth could have become part of the British Empire.

Cultural diversity and territorial flexibility give empires not only their unique character, but also their central role in history. It's thanks to these two characteristics that empires have managed to unite diverse ethnic groups and ecological zones under a single political umbrella, thereby fusing together larger and larger segments of the human species and of planet Earth.

帝國的特點之一是擁有彈性的邊界和可能無限的擴張慾望。它們可以吞噬和消化更多的國家和地區，而不改變其基本結構或身份認同。今天的英國國家有相當清晰的邊界，超出邊界則必須改變國家的基礎結構和身份認同。一個世紀前，幾乎地球上的任何地方都可以成為英國帝國的一部分。文化多樣性和領土靈活性不僅賦予帝國獨特的特徵，也賦予了其在歷史中的核心作用。正是由於這兩個特性，帝國成

功地將不同的民族群體和生態地區統合在單一的政治範圍下，從而將人類和地球的更大更廣的部分融合在一起。

It should be stressed that an empire is defined solely by its cultural diversity and flexible borders, rather than by its origins, its form of government, its territorial extent, or the size of its population. An empire need not emerge from military conquest. The Athenian Empire began its life as a voluntary league, and the Habsburg Empire was born in wedlock, cobbled together by a string of shrewd marriage alliances. Nor must an empire be ruled by an autocratic emperor. The British Empire, the largest empire in history, was ruled by a democracy. Other democratic (or at least republican) empires have included the modern Dutch, French, Belgian and American empires, as well as the premodern empires of Novgorod, Rome, Carthage and Athens.

Size, too, does not really matter. Empires can be puny. The Athenian Empire at its zenith was much smaller in size and population than today's Greece. The Aztec Empire was smaller than today's Mexico. Both were nevertheless empires, whereas modern Greece and modern Mexico are not, because the former gradually subdued dozens and even hundreds of different polities while the latter have not. Athens lorded it over more than a hundred formerly independent city states, whereas the Aztec Empire, if we can trust its taxation records, ruled 371 different tribes and peoples.¹

重申一下，帝國的定義僅僅取決於其文化多樣性和靈活的邊界，而不是其起源、政府形式、領土範圍或人口大小。帝國不一定是由軍事征服產生的。雅典帝國開始時是作為自願聯盟，而哈布斯堡帝國則是在婚姻聯盟的基礎上組成的。帝國也不一定由獨裁皇帝統治。英國帝國是歷史上最大的帝國，但由民主統治。其他民主（或至少共和）帝國還包括現代的荷蘭、法國、比利時和美國帝國，以及古代的諾夫哥羅德、羅馬、迦太基和雅典帝國。大小也不是很重要。帝國可以很小。雅典帝國在其鼎盛時期比今天的希臘領土和人口都小得多。阿茲特克帝國比今天的墨西哥小。兩者仍然是帝國，而現代的希臘和墨西哥卻不是，因為前者逐漸征服了數十甚至數百個不同的政治實體，而後者卻沒有。雅典曾統治超過一百個曾經獨立的城邦，而如果我們相信阿茲特克帝國的稅收記錄，那麼它統治了371個不同的部落和民族。

How was it possible to squeeze such a human potpourri into the territory of a modest modern state? It was possible because in the past there were many more distinct peoples in the world, each of which had a smaller population and occupied less territory than today's typical people. The land between the Mediterranean and the Jordan River, which today struggles to satisfy the ambitions of just two peoples, easily accommodated in biblical times dozens of nations, tribes, petty kingdoms and city states.

Empires were one of the main reasons for the drastic reduction in human diversity. The imperial steamroller gradually obliterated the unique characteristics of numerous peoples (such as the Numantians), forging out of them new and much larger groups.

Evil Empires?

In our time, 'imperialist' ranks second only to 'fascist' in the lexicon of political swear words. The contemporary critique of empires commonly takes two forms:

如何將如此豐富多元的人民擠進一個謙虛的現代國家領土中？過去這是可能的，因為世界上有更多明顯的不同族群，每個族群的人口和佔地面積都比現今的典型族群小。地中海和約旦河之間的土地，在聖經時代輕鬆容納了數十個國家、部落、小王國和城邦，但今天這片土地只能滿足兩個民族的野心。帝國是減少人類多樣性的主要原因之一。帝國的推進器逐漸消滅了許多民族的獨特特徵（例如努曼提亞人），將它們結合在一起形成更大的群體。在我們這個時代，“帝國主義”僅次於“法西斯主義”成為政治譁眾取寵的語言。當代對帝國的批評通常有兩種形式：

1. Empires do not work. In the long run, it is not possible to rule effectively over a large number of conquered peoples.
2. Even if it can be done, it should not be done, because empires are evil engines of destruction and exploitation. Every people has a right to self-determination, and should never be subject to the rule of another.

From a historical perspective, the first statement is plain nonsense, and the second is deeply problematic.

The truth is that empire has been the world's most common form of political organisation for the last 2,500 years. Most humans during these two and a half millennia have lived in empires. Empire is also a very stable form of government. Most empires have found it alarmingly easy to put down rebellions. In general, they have been toppled only by external invasion or by a split within the ruling elite. Conversely, conquered peoples don't have a very good record of freeing themselves from their imperial overlords. Most have remained subjugated for hundreds of years. Typically, they have been slowly digested by the conquering empire, until their distinct cultures fizzled out.

1. 帝國並不奏效。長遠來看，統治大量被征服的人民並不能有效地執掌。2. 即使可以做到，也不應該這樣做，因為帝國是毀滅和掠奪的邪惡機器。每個民族都有自決權，永遠不應受另一個民族的統治。從歷史的角度來看，第一個說法是明顯荒誕的，而第二個說法則存在深刻的問題。事實上，帝國已是世界上最普遍的政治組織形式之一，已有2500年之久。在這兩千五百年的時光裡，大多數人類生活在帝國裡。帝國也是非常穩定的政府形式。大多數的帝國都輕易地平息了反叛。通常，它們只有被外來侵略或統治精英內部分裂才會被推翻。相反地，被征服的人民並沒有很好地解放自己擺脫帝國的統治。大多數人民被征服數百年之久。通常，他們被征服的文化被慢慢同化，直到他們的獨特文化消失。

For example, when the Western Roman Empire finally fell to invading Germanic tribes in 476 AD , the Numantians, Arverni, Helvetians, Samnites, Lusitanians, Umbrians, Etruscans and hundreds of other forgotten peoples whom the Romans conquered centuries earlier did not emerge from the empires eviscerated carcass like Jonah from the belly of the great fish. None of them were left. The biological descendants of the people who had identified themselves as members of those nations, who had spoken their languages, worshipped their gods and told their myths and legends, now thought, spoke and worshipped as Romans.

In many cases, the destruction of one empire hardly meant independence for subject peoples. Instead, a new empire stepped into the vacuum created when the old one collapsed or retreated. Nowhere has this been more obvious than in the Middle East. The current political constellation in that region – a balance of power between many independent political entities with more or less stable borders – is almost without parallel any time in the last several millennia. The last time the Middle East experienced such a situation was in the eighth century BC – almost 3,000 years ago! From the rise of the Neo-Assyrian Empire in the eighth century BC until the collapse of the British and French empires in the mid-twentieth century AD, the Middle East passed from the hands of one empire into the hands of another, like a baton in a relay race. And by the time the British and French finally dropped the baton, the Aramaeans, the Ammonites, the Phoenicians, the Philistines, the Moabites, the Edomites and the other peoples conquered by the Assyrians had long disappeared.

例如，當西羅馬帝國在476年被入侵的日耳曼部落終於滅亡時，數個世紀前被羅馬征服的紐曼提亞人、阿爾維爾尼人、赫爾維蒂人、山尼人、盧西塔尼亞人、翁布里亞人、伊特魯里亞人和其他被遺忘的民族並沒有像約拿從大魚肚子裡出來一樣從帝國的軀體中站起來。他們所有的人都已經消失了。那些自認為是這些民族成員、曾講自己的語言、崇拜他們的神祇並講述他們的神話和傳說的人們的生物後代，現在想、講和崇拜的都是羅馬人的方式。在許多情況下，一個帝國的毀滅並不意味著附屬民族的獨立。相反，一個新的帝國進入了當舊帝國崩潰或撤退時產生的真空中。這一點在中東地區尤為明顯。當前該地區的政治構造——許多獨立的政治實體之間的權力平衡，其邊界相對穩定——幾乎在過去幾千年中沒有任何先例。中東最後一次經歷這種情況是在公元前8世紀——近3000年前！從公元前8世紀新亞述帝國的崛起到英法帝國在20世紀中葉的崩潰，中東一直從一個帝國的手中轉移到另一個帝國的手中，就像接力賽中的接力棒一樣。當英國和法國最終放下了接力棒時，被亞述人征服的阿拉米人、亞捫人、腓尼基人、非利士人、摩押人、以東人和其他民族早已經消失了。

True, today's Jews, Armenians and Georgians claim with some measure of justice that they are the offspring of ancient Middle Eastern peoples. Yet these are only exceptions that prove the rule, and even these claims are somewhat exaggerated. It goes without saying that the political, economic

and social practices of modern Jews, for example, owe far more to the empires under which they lived during the past two millennia than to the traditions of the ancient kingdom of Judaea. If King David were to show up in an ultra-Orthodox synagogue in present-day Jerusalem, he would be utterly bewildered to find people dressed in East European clothes, speaking in a German dialect (Yiddish) and having endless arguments about the meaning of a Babylonian text (the Talmud). There were neither synagogues, volumes of Talmud, nor even Torah scrolls in ancient Judaea.

今天的猶太人、亞美尼亞人和格魯吉亞人聲稱他們是古代中東人民的後裔，這是有些道理的。然而，這些只是例外，證明了一個規則，而且即使這些主張有些夸大。不用說，現代猶太人的政治、經濟和社會實踐，比如說，過去兩千年他們生活在的帝國，遠比古代猶大王國的傳統更有影響力。如果大衛王出現在當今耶路撒冷的一個烏托邦正統猶太教堂裡，他會被完全搞糊塗，因為他會發現人們穿著東歐衣服，說著德語方言（意第緒語）並且在無休止地爭論巴比倫文本（塔木德）的意義。在古代的猶大，沒有猶太教堂，也沒有塔木德卷軸。

Building and maintaining an empire usually required the vicious slaughter of large populations and the brutal oppression of everyone who was left. The standard imperial toolkit included wars, enslavement, deportation and genocide. When the Romans invaded Scotland in AD 83, they were met by fierce resistance from local Caledonian tribes, and reacted by laying waste to the country. In reply to Roman peace offers, the chieftain Calgacus called the Romans ‘the ruffians of the world’, and said that ‘to plunder, slaughter and robbery they give the lying name of empire; they make a desert and call it peace’. ²

This does not mean, however, that empires leave nothing of value in their wake. To colour all empires black and to disavow all imperial legacies is to reject most of human culture. Imperial elites used the profits of conquest to finance not only armies and forts but also philosophy, art, justice and charity. A significant proportion of humanity’s cultural achievements owe their existence to the exploitation of conquered populations. The profits and prosperity brought by Roman imperialism provided Cicero, Seneca and St Augustine with the leisure and wherewithal to think and write; the Taj Mahal could not have been built without the wealth accumulated by Mughal

exploitation of their Indian subjects; and the Habsburg Empire's profits from its rule over its Slavic, Hungarian and Romanian-speaking provinces paid Haydn's salaries and Mozart's commissions. No Caledonian writer preserved Calgacus' speech for posterity. We know of it thanks to the Roman historian Tacitus. In fact, Tacitus probably made it up. Most scholars today agree that Tacitus not only fabricated the speech but invented the character of Calgacus, the Caledonian chieftain, to serve as a mouthpiece for what he and other upper-class Romans thought about their own country.

建立和維持一個帝國通常需要大量屠殺和殘酷的壓迫。標準的帝國工具箱包括戰爭、奴役、遣返和屠殺。當羅馬在公元83年入侵蘇格蘭時，當地的卡里多尼亞部落展開了激烈的抵抗，羅馬人便毀滅了整個國家。對於羅馬的和平提議，酋長卡爾加克斯稱羅馬人為“世界上的暴徒”，並說他們“將搶劫、屠殺和搶劫塗上了帝國的謊言；他們把一片沙漠叫做和平”。不過，這並不意味著帝國在它們走後就一無是處。把所有帝國都染成黑色，否認所有的帝國遺產，這樣做就是否定了大部分人類文化。帝國的精英們利用征服的利潤來資助軍隊、堡壘，還有哲學、藝術、司法和慈善事業。人類文化成就中相當一部分要歸功於征服人口所帶來的開發。羅馬帝國的利潤和繁榮提供了西塞羅、塞內卡和聖奧古斯丁思考和寫作的閒暇和資源；若非莫卧兒對印度臣民的剝削所累積的財富，泰姬陵不可能建造；哈布斯堡帝國在統治其斯拉夫、匈牙利和羅馬尼亞省份時的收益支付了海頓和莫扎特的佣金。沒有卡里多尼亞的作家為後人保存了卡爾加克斯的演講。我們能知道這段演講，多虧了羅馬歷史學家塔西佗。實際上，塔西佗可能是編造了這份講話，還創造了卡爾加克斯這個卡里多尼亞酋長的角色，用來代表他和其他上流羅馬人對自己國家的想法。

Even if we look beyond elite culture and high art, and focus instead on the world of common people, we find imperial legacies in the majority of modern cultures. Today most of us speak, think and dream in imperial languages that were forced upon our ancestors by the sword. Most East Asians speak and dream in the language of the Han Empire. No matter what their origins, nearly all the inhabitants of the two American continents, from Alaska's Barrow Peninsula to the Straits of Magellan, communicate in one of four imperial languages: Spanish, Portuguese, French or English. Present-day Egyptians speak Arabic, think of themselves as Arabs, and identify wholeheartedly with the Arab Empire that conquered Egypt in the seventh

century and crushed with an iron fist the repeated revolts that broke out against its rule. About 10 million Zulus in South Africa hark back to the Zulu age of glory in the nineteenth century, even though most of them descend from tribes who fought *against* the Zulu Empire, and were incorporated into it only through bloody military campaigns.

即使我們超越精英文化和高級藝術，轉而關注普通人的世界，我們仍然可以在大多數現代文化中發現帝國的遺產。今天，我們大多數人說話、思考和夢想的帝國語言都是我們的祖先在刀劍下被強迫學習的。大多數東亞人說話和夢想的語言是漢朝的語言。無論他們的出身如何，從阿拉斯加的巴羅半島到馬哲倫海峽，兩個美洲大陸的幾乎所有居民都使用四種帝國語言之一：西班牙語、葡萄牙語、法語或英語。現代埃及人說阿拉伯語，認為自己是阿拉伯人，並全心全意地認同于征服埃及并用鐵腕鎮壓爆發反叛的阿拉伯帝國。南非大約有1,000萬祖魯人回想著19世紀祖魯帝國的輝煌年代，盡管他們大多數是從反對祖魯帝國的部落中繼承而來的，只有通過流血戰爭才被納入其中。

It's for Your Own Good

The first empire about which we have definitive information was the Akkadian Empire of Sargon the Great (c .2250 BC). Sargon began his career as the king of Kish, a small city state in Mesopotamia. Within a few decades he managed to conquer not only all other Mesopotamian city states, but also large territories outside the Mesopotamian heartland. Sargon boasted that he had conquered the entire world. In reality, his dominion stretched from the Persian Gulf to the Mediterranean, and included most of today's Iraq and Syria, along with a few slices of modern Iran and Turkey.

The Akkadian Empire did not last long after its founder's death, but Sargon left behind an imperial mantle that seldom remained unclaimed. For the next 1,700 years, Assyrian, Babylonian and Hittite kings adopted Sargon as a role model, boasting that they, too, had conquered the entire world. Then, around 550 BC , Cyrus the Great of Persia came along with an even more impressive boast.

我們所確定的第一個帝國是薩爾貢（公元前2250年）的阿卡德帝國。薩爾貢的職業生涯始於美索不達米亞小城市國基什國王，他在幾十年內征服了所有其他美索不達米亞城市國，並且還征服了美索不達米亞以外的大片領土。薩爾貢自誇征服了整個世界。實際上，他的統治範圍從波斯灣延伸到地中海，包括了今天伊拉克和敘利亞的大部分地區，以及現代伊朗和土耳其的一些地區。阿卡德帝國在其創始人去世後沒有持久存在，但薩爾貢留下了一個幾乎沒有被任何人放棄的帝國皇冠。在接下來的1700年中，亞述、巴比倫和赫梯的國王都以薩爾貢為榜樣，自誇自己也征服了整個世界。然後，在公元前550年左右，波斯的居魯士大帝出現了，並且以更令人印象深刻的誇耀行徑擊敗了其他帝王。



Map 4. The Akkadian Empire and the Persian Empire .

The kings of Assyria always remained the kings of Assyria. Even when they claimed to rule the entire world, it was obvious that they were doing it for the greater glory of Assyria, and they were not apologetic about it. Cyrus, on the other hand, claimed not merely to rule the whole world, but to do so for the sake of all people. ‘We are conquering you for your own benefit,’ said the Persians. Cyrus wanted the peoples he subjected to love him and to count

themselves lucky to be Persian vassals. The most famous example of Cyrus' innovative efforts to gain the approbation of a nation living under the thumb of his empire was his command that the Jewish exiles in Babylonia be allowed to return to their Judaean homeland and rebuild their temple. He even offered them financial assistance. Cyrus did not see himself as a Persian king ruling over Jews – he was also the king of the Jews, and thus responsible for their welfare.

地圖4。阿卡德帝國和波斯帝國。亞述的國王們總是保持亞述的國王地位。即使他們聲稱統治整個世界，顯然他們是為了亞述的榮耀而這麼做，而且他們對此毫不道歉。另一方面，居魯士聲稱不僅統治全世界，而且是為了所有人的利益而這麼做。波斯人說：“我們征服你們是為了你們自己的好處。”居魯士希望被他征服的人民愛他，並且認為自己很幸運成為波斯的附庸國。居魯士創新的努力中最著名的例子是他下令讓在巴比倫被流放的猶太人返回猶大家鄉並重建他們的聖殿。他甚至提供了財政援助。居魯士不認為自己是統治猶太人的波斯國王——他同時也是猶太人的國王，因此負責他們的福利。

The presumption to rule the entire world for the benefit of all its inhabitants was startling. Evolution has made *Homo sapiens*, like other social mammals, a xenophobic creature. Sapiens instinctively divide humanity into two parts, 'we' and 'they'. We are people like you and me, who share our language, religion and customs. We are all responsible for each other, but not responsible for them. We were always distinct from them, and owe them nothing. We don't want to see any of them in our territory, and we don't care an iota what happens in their territory. They are barely even human. In the language of the Dinka people of the Sudan, 'Dinka' simply means 'people'. People who are not Dinka are not people. The Dinka's bitter enemies are the Nuer. What does the word Nuer mean in Nuer language? It means 'original people'. Thousands of kilometres from the Sudan deserts, in the frozen ice-lands of Alaska and north-eastern Siberia, live the Yupiks. What does Yupik mean in Yupik language? It means 'real people'.³

覺得要統治整個世界來造福所有居民這樣的假設真是令人驚訝。進化使得人類智人和其他群居哺乳動物一樣，都有排外的天性。智人本能地將人類分為「我們」和「他們」。我們是和你我一樣，分享語言、宗教和習俗的人。我們彼此負有責任，但不負責任他們。我們一直與

他們不同，對他們一無所有。我們不想在我們的領土上見到他們的任何一個人，對他們領土上發生的事情根本不在乎。他們幾乎連人都不算。在蘇丹的丁卡人的語言中，「丁卡」就是「人」的意思。不是丁卡人的人就不是人。丁卡人的死敵是努爾人。在數千公里外的阿拉斯加和東北西伯利亞的冰極地區，生活著愚皮克人。「愚皮克」在愚皮克語中的意思是「真正的人」。

In contrast with this ethnic exclusiveness, imperial ideology from Cyrus onward has tended to be inclusive and all-encompassing. Even though it has often emphasised racial and cultural differences between rulers and ruled, it has still recognised the basic unity of the entire world, the existence of a single set of principles governing all places and times, and the mutual responsibilities of all human beings. Humankind is seen as a large family: the privileges of the parents go hand in hand with responsibility for the welfare of the children.

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.

相對於這種種族封閉性，從古代波斯皇帝賽魯斯（Cyrus）開始，帝國意識形態傾向於全包容性。雖然它常常強調統治者和被統治者之間的種族和文化差異，但它仍然承認整個世界的基本統一，存在一套統御所有地方和時代的原則，並且所有人類都有相互負責的義務。人類被看作是一個大家庭：父母的特權與照顧孩子的福利手牽手相伴。這種新帝國願景從賽魯斯和波斯人傳承給亞歷山大大帝，再由他傳給希臘化的國王、羅馬皇帝、穆斯林哈里發、印度王朝，甚至最終傳達給蘇聯總理和美國總統。這種慈悲的帝國願景同時證明了帝國的存在，也否定了不只是臣民爭取自由的試圖，還包括獨立民族抵制帝國擴張的試圖。

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.

類似於波斯模式的帝國願景在世界其他地區也獨立發展出來，尤其是在中美洲、安第斯地區和中國。根據傳統的中國政治理論，天（天）是地球上所有合法權力的來源。天選擇最值得的人或家庭並賦予他們天命。然後，這個人或家庭就統治天下萬民以造福於所有居民。因此，合法機構從定義上來說是普遍的。如果一個統治者缺乏天命，那麼他甚至不能統治一個城市。如果統治者擁有天命，他有義務將正義和和諧傳遍整個世界。天命無法同時賦予多個候選人，因此不能使存在多個獨立國家合法。

The first emperor of the united Chinese empire, Qín Shǐ Huángdì, 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.

中國聯邦帝國的第一位皇帝秦始皇自豪地宣稱，“在宇宙六方之內，一切都屬於皇帝……凡有人煙之處，皆無不歸順皇帝……他的仁慈甚至

到達了牛馬，沒有任何一個動物沒有受益。每個人都可以在自己的屋簷下安全自保。”⁴ 在中國政治思想和歷史記憶中，帝王時期因此被視為秩序和正義的黃金時代。與現代西方觀點認為公正的世界由獨立的國家組成不同，在中國，政治分裂的時期被視為混亂和不公正的黑暗時代。這種看法對中國歷史產生了深遠的影響。每當一個帝國崩潰時，占主導地位的政治理論都激勵著當權者不要再安於瑣碎的獨立原則，而要試圖實現統一。遲早這些嘗試總是會成功。

When They Become Us

Empires have played a decisive part in amalgamating many small cultures into fewer big cultures. Ideas, people, goods and technology spread more easily within the borders of an empire than in a politically fragmented region. Often enough, it was the empires themselves which deliberately spread ideas, institutions, customs and norms. One reason was to make life easier for themselves. It is difficult to rule an empire in which every little district has its own set of laws, its own form of writing, its own language and its own money. Standardisation was a boon to emperors.

A second and equally important reason why empires actively spread a common culture was to gain legitimacy. At least since the days of Cyrus and Qín Shǐ Huángdì, empires have justified their actions – whether road-building or bloodshed – as necessary to spread a superior culture from which the conquered benefit even more than the conquerors.

大帝國致力於融合許多小文化，形成更少的大文化。在帝國境內，思想、人員、商品和技術更容易傳播，比在政治分裂的地區更容易。而且，往往是帝國自己有意地傳播思想、制度、習俗和規範。其中一個原因是為了讓自己的生活更輕鬆舒適。如果每個小區域都有自己的法律、書寫方式、語言和貨幣，統治這個帝國就很難了。標準化對於皇帝們來說是一個福音。大帝國積極傳播共同的文化的第二個同等重要的原因是為了獲得合法性。自從居魯士和秦始皇的時代以來，帝國一直將自己的行動——不論是建設道路還是流血——視為必要的，以傳播優越文化，征服者所受益比征服者更多。

The benefits were sometimes salient – law enforcement, urban planning, standardisation of weights and measures – and sometimes questionable – taxes, conscription, emperor worship. But most imperial elites earnestly believed that they were working for the general welfare of all the empires inhabitants. China's ruling class treated their country's neighbours and its foreign subjects as miserable barbarians to whom the empire must bring the benefits of culture. The Mandate of Heaven was bestowed upon the emperor not in order to exploit the world, but in order to educate humanity. The Romans, too, justified their dominion by arguing that they were endowing the barbarians with peace, justice and refinement. The wild Germans and painted Gauls had lived in squalor and ignorance until the Romans tamed them with law, cleaned them up in public bathhouses, and improved them with philosophy. The Mauryan Empire in the third century BC took as its mission the dissemination of Buddha's teachings to an ignorant world. The Muslim caliphs received a divine mandate to spread the Prophet's revelation, peacefully if possible but by the sword if necessary. The Spanish and Portuguese empires proclaimed that it was not riches they sought in the Indies and America, but converts to the true faith. The sun never set on the British mission to spread the twin gospels of liberalism and free trade. The Soviets felt duty-bound to facilitate the inexorable historical march from capitalism towards the utopian dictatorship of the proletariat. Many Americans nowadays maintain that their government has a moral imperative to bring Third World countries the benefits of democracy and human rights, even if these goods are delivered by cruise missiles and F-16s.

好處有時是明顯的-執法、城市規劃、重量和度量的標準化-有時是值得懷疑的-徵稅、徵兵、皇帝崇拜。但大多數帝國精英都切實認為，他們正在為所有帝國居民的普遍福祉而努力。中國的統治階級將他們國家的鄰居和外國公民視為不幸的野蠻人，他們必須把文化的好處帶給帝國。上天的命令不是賦予皇帝剝削世界的權利，而是為了教育人類。羅馬人也通過論證他們將野蠻人賦予和平、正義和文明來辯護他們的統治。野蠻的日耳曼人和彩色的高盧人生活在貧困和無知中，直到羅馬人用法律馴服了他們，在公共浴室裡洗淨了他們，並通過哲學加以改進。公元前三世紀的毛裡揚帝國把佛陀的教義傳播到一個愚昧的世界中。穆斯林哈里發們接受了上帝的命令，必要時用劍傳播先知的啟示，並且希望和平。西班牙和葡萄牙帝國宣布，他們在印度和美洲尋求的不是財富，而是皈依真正信仰的人。英國的使命是傳播自由

主義和自由貿易的雙重福音。蘇聯感到有責任促進從資本主義到無產階級烏托邦獨裁的不可逆向歷史進程。現在許多美國人主張，他們的政府有道德責任向第三世界國家傳遞民主和人權的好處，即使這些商品是通過巡航導彈和F-16傳遞的。

The cultural ideas spread by empire were seldom the exclusive creation of the ruling elite. Since the imperial vision tends to be universal and inclusive, it was relatively easy for imperial elites to adopt ideas, norms and traditions from wherever they found them, rather than to stick fanatically to a single hidebound tradition. While some emperors sought to purify their cultures and return to what they viewed as their roots, for the most part empires have begot hybrid civilisations that absorbed much from their subject peoples. The imperial culture of Rome was Greek almost as much as Roman. The imperial Abbasid culture was part Persian, part Greek, part Arab. Imperial Mongol culture was a Chinese copycat. In the imperial United States, an American president of Kenyan blood can munch on Italian pizza while watching his favourite film, *Lawrence of Arabia*, a British epic about the Arab rebellion against the Turks.

帝國傳播的文化觀念很少是統治菁英的獨家創造。由於帝國的願景往往是普遍和包容的，因此帝國菁英相對較容易從任何地方採納想法、規範和傳統，而不是固執於單一僵化的傳統。雖然有些皇帝試圖淨化他們的文化，回到他們認為的根源，但大多數帝國都孕育了混合的文明，吸收了他們的屬民所擁有的許多東西。羅馬帝國的帝國文化幾乎是希臘和羅馬的。阿巴斯王朝的帝國文化是波斯的一部分，希臘的一部分，阿拉伯的一部分。帝國的蒙古文化則是中國的仿冒品。在帝國的美國，一位肯尼亞血統的美國總統可以享用義大利比薩餅，同時觀看他最喜愛的電影《阿拉伯的勇士》，這是一部關於阿拉伯人反抗土耳其人的英國史詩片。

Not that this cultural melting pot made the process of cultural assimilation any easier for the vanquished. The imperial civilisation may well have absorbed numerous contributions from various conquered peoples, but the hybrid result was still alien to the vast majority. The process of assimilation was often painful and traumatic. It is not easy to give up a familiar and loved local tradition, just as it is difficult and stressful to understand and adopt a new culture. Worse still, even when subject peoples were successful in

adopting the imperial culture, it could take decades, if not centuries, until the imperial elite accepted them as part of ‘us’. The generations between conquest and acceptance were left out in the cold. They had already lost their beloved local culture, but they were not allowed to take an equal part in the imperial world. On the contrary, their adopted culture continued to view them as barbarians.

這個文化中心雖然接納了從荒野而來的貢獻，但卻並沒有使被征服者文化的融合過程變得更容易。帝國的文明可能吸收了許多被統治民族的貢獻，但混合後的結果對大多數人來說仍然是陌生的。同化的過程通常是痛苦和創傷的。放棄一個熟悉並深愛的當地傳統並不容易，就像理解和採納新文化一樣困難且壓力重重。更糟糕的是，即使被征服的民族成功地採納了帝國文化，也可能需要幾十年甚至幾個世紀，才能被帝國精英接受為「我們」的一份子。征服和接受之間的世代被排除在寒冷之外。他們已經失去了自己深愛的本地文化，但卻不被允許在帝國世界中佔有平等的地位。相反，他們所採納的文化仍然把他們視為野蠻人。

Imagine an Iberian of good stock living a century after the fall of Numantia. He speaks his native Celtic dialect with his parents, but has acquired impeccable Latin, with only a slight accent, because he needs it to conduct his business and deal with the authorities. He indulges his wife’s penchant for elaborately ornate baubles, but is a bit embarrassed that she, like other local women, retains this relic of Celtic taste – he’d rather have her adopt the clean simplicity of the jewellery worn by the Roman governor’s wife. He himself wears Roman tunics and, thanks to his success as a cattle merchant, due in no small part to his expertise in the intricacies of Roman commercial law, he has been able to build a Roman-style villa. Yet, even though he can recite Book III of Virgil’s *Georgics* by heart, the Romans still treat him as though he’s semi-barbarian. He realises with frustration that he’ll never get a government appointment, or one of the really good seats in the amphitheatre.

想像一位來自來自深具血統的伊比利亞人，生活在努曼提亞陷落一個世紀後。他跟父母說自己土生土長的凱爾特語，但在拉丁語方面卻非常的嫋熟，僅僅有輕微的口音。因為他需要在生意和跟當局打交道時用到拉丁文。他會滿足他妻子對華麗精緻的裝飾品的喜愛，但他有些尷尬，因為她和其他的當地女性一樣，保留著這個凱爾特風格的遺產

- 他寧願她採用羅馬總督妻子穿戴的簡潔整潔的珠寶飾品。他自己穿著羅馬束腰外衣，幸虧他作為一位牛肉商人的成功，其中很大一部分要歸功於他在羅馬商業法律的繁複程度方面的專業知識，因此他已經能夠建立起羅馬式的別墅了。然而，即使他可以背誦維吉爾的《農事詩》第三卷，羅馬人仍然把他當作半裸野蠻人對待。他意識到自己很沮喪，永遠不會獲得政府任命，或是在競技場上得到最好的座位。

In the late nineteenth century, many educated Indians were taught the same lesson by their British masters. One famous anecdote tells of an ambitious Indian who mastered the intricacies of the English language, took lessons in Western-style dance, and even became accustomed to eating with a knife and fork. Equipped with his new manners, he travelled to England, studied law at University College London, and became a qualified barrister. Yet this young man of law, bedecked in suit and tie, was thrown off a train in the British colony of South Africa for insisting on travelling first class instead of settling for third class, where ‘coloured’ men like him were supposed to ride. His name was Mohandas Karamchand Gandhi.

In some cases the processes of acculturation and assimilation eventually broke down the barriers between the newcomers and the old elite. The conquerors no longer saw the empire as an alien system of occupation, and the conquerors came to view their subjects as equal to themselves. Rulers and ruled alike came to see ‘them’ as ‘us’. All the subjects of Rome eventually, after centuries of imperial rule, were granted Roman citizenship. Non-Romans rose to occupy the top ranks in the officer corps of the Roman legions and were appointed to the Senate. In AD 48 the emperor Claudius admitted to the Senate several Gallic notables, who, he noted in a speech, through ‘customs, culture, and the ties of marriage have blended with ourselves’. Snobbish senators protested introducing these former enemies into the heart of the Roman political system. Claudius reminded them of an inconvenient truth. Most of their own senatorial families descended from Italian tribes who once fought against Rome, and were later granted Roman citizenship. Indeed, the emperor reminded them, his own family was of Sabine ancestry.⁵

19世紀末，許多受過教育的印度人都從他們的英國主人那裡學到了同樣的教訓。一個著名的軼事講述了一個野心勃勃的印度人，他掌握了

英語的細節，學習了西方風格的舞蹈，甚至習慣了用刀叉進餐。憑藉他的新禮儀，他到英國旅行，在倫敦大學學院學習法律，成為了一名合格的大律師。然而，這位打扮整潔，衣冠楚楚的年輕律師在英國殖民地南非的火車上被扔下了，因為他堅持要坐頭等艙，而不是安頓在第三等艙，那裡像他這樣的“有色人種”應該乘坐。他的名字是莫漢達斯·卡拉姆欽德·甘地。在某些情況下，同化和適應的過程最終打破了新來者和老精英之間的障礙。征服者不再把帝國視為一個外來的佔領體系，而征服者開始認為他們的臣民和他們平等。統治者和被統治者都開始將“他們”視為“我們”的一部分。在羅馬帝國的所有臣民最終，在經過數世紀的帝國統治後，被授予羅馬公民身份。非羅馬人上升到羅馬軍團將領的最高職位，被任命為參議院成員。公元48年，皇帝克勞狄烏斯承認了幾位高盧貴族，他在一次演講中指出，透過“風俗、文化和婚姻關係，他們已經融入了我們”。*snobbish*參議員抗議將這些曾經的敵人引入羅馬政治體系的核心。克勞狄烏斯提醒他們一個不方便的真相。他們自己的大部分參議院家族都是意大利部落的後裔，曾經反抗羅馬，後來被授予羅馬公民身份。事實上，皇帝提醒他們，他自己的家族是薩比尼族的後裔。

During the second century AD, Rome was ruled by a line of emperors born in Iberia, in whose veins probably flowed at least a few drops of local Iberian blood. The reigns of Trajan, Hadrian, Antoninus Pius and Marcus Aurelius are generally thought to constitute the empire's golden age. After that, all the ethnic dams were let down. Emperor Septimius Severus (193–211) was the scion of a Punic family from Libya. Elagabalus (218–22) was a Syrian. Emperor Philip (244–9) was known colloquially as 'Philip the Arab'. The empire's new citizens adopted Roman imperial culture with such zest that, for centuries and even millennia after the empire itself collapsed, they continued to speak the empire's language, to believe in the Christian God that the empire had adopted from one of its Levantine provinces, and to live by the empire's laws.

公元二世紀時，羅馬帝國由一系列出生於伊比利亞半島的皇帝統治，他們的血液中可能流淌著當地伊比利亞人的血液。崔亞強、哈德良、安東尼努斯·皮烏斯和馬爾庫斯·奧里利烏斯的統治被普遍認為構成了帝國的黃金時代。此後，所有的族裔壁壘崩塌了。塞普蒂米烏斯·塞維魯斯皇帝（193-211）是來自利比亞的腓尼基家族的後裔。埃拉加巴盧

斯（218-22）是敘利亞人。皇帝菲利普（244-9）俗稱“阿拉伯菲利普”。帝國的新公民非常熱衷地接受了羅馬帝國的文化，以至於幾個世紀甚至幾千年後，即使帝國本身已經崩潰，他們仍然繼續使用帝國的語言，信仰帝國從其黎凡特省份之一採納的基督教上帝，並依照帝國的法律生活。

A similar process occurred in the Arab Empire. When it was established in the mid-seventh century AD , it was based on a sharp division between the ruling Arab–Muslim elite and the subjugated Egyptians, Syrians, Iranians and Berbers, who were neither Arabs nor Muslim. Many of the empire’s subjects gradually adopted the Muslim faith, the Arabic language and a hybrid imperial culture. The old Arab elite looked upon these parvenus with deep hostility, fearing to lose its unique status and identity. The frustrated converts clamoured for an equal share within the empire and in the world of Islam. Eventually they got their way. Egyptians, Syrians and Mesopotamians were increasingly seen as ‘Arabs’. Arabs, in their turn – whether authentic’ Arabs from Arabia or newly minted Arabs from Egypt and Syria – came to be increasingly dominated by non-Arab Muslims, in particular by Iranians, Turks and Berbers. The great success of the Arab imperial project was that the imperial culture it created was wholeheartedly adopted by numerous non-Arab people, who continued to uphold it, develop it and spread it – even after the original empire collapsed and the Arabs as an ethnic group lost their dominion.

阿拉伯帝國也經歷了類似的過程。當於7世紀中期建立時，它是建立在統治階層的阿拉伯 - 穆斯林精英與被征服的埃及人、敘利亞人、伊朗人和柏柏爾人之間的銳利分裂上，這些人既不是阿拉伯人也不是穆斯林。帝國的許多臣民逐漸接受了穆斯林信仰，阿拉伯語和一種混合的帝國文化。老的阿拉伯貴族深深地敵視這些異鄉者，害怕失去自己獨特的地位和身份。沮喪的改信者要求在帝國和伊斯蘭世界中獲得平等的份額。最終，他們得到了他們的方式。埃及人、敘利亞人和美索不達米亞人越來越被視為“阿拉伯人”。轉型中的阿拉伯人，無論是從阿拉伯半島還是埃及和敘利亞新近製造的“阿拉伯人”，也越來越被非阿拉伯穆斯林所主宰，特別是伊朗人、土耳其人和柏柏爾人。阿拉伯帝國的巨大成功在於它所創造的帝國文化深受許多非阿拉伯民族的採用，他們繼續維護、發展和傳播它——即使在原始帝國崩潰和阿拉伯民族失去主導地位之後。

In China the success of the imperial project was even more thorough. For more than 2,000 years, a welter of ethnic and cultural groups first termed barbarians were successfully integrated into imperial Chinese culture and became Han Chinese (so named after the Han Empire that ruled China from 206 BC to AD 220). The ultimate achievement of the Chinese Empire is that it is still alive and kicking, yet it is hard to see it as an empire except in outlying areas such as Tibet and Xinjiang. More than 90 per cent of the population of China are seen by themselves and by others as Han.

We can understand the decolonisation process of the last few decades in a similar way. During the modern era Europeans conquered much of the globe under the guise of spreading a superior Western culture. They were so successful that billions of people gradually adopted significant parts of that culture. Indians, Africans, Arabs, Chinese and Maoris learned French, English and Spanish. They began to believe in human rights and the principle of self-determination, and they adopted Western ideologies such as liberalism, capitalism, Communism, feminism and nationalism.

在中國，帝國項目的成功更加徹底。超過2,000年來，一群最初被稱為野蠻人的種族和文化群體被成功地融入到中國的帝國文化中，並成為漢人（以漢帝國為名，該帝國統治了從公元前206年到公元220年的中國）。中國帝國的最終成就在於它仍然活著，然而除了藏疆等邊緣地區外，很難把它看作帝國。中國超過90%的人口自認為和被其他人視為漢人。我們可以把近幾十年的去殖民化過程理解為類似的。在現代時代，歐洲人在推廣一種優越的西方文化的幌子下征服了全球的大部分地區。他們取得了成功，億萬人逐漸接受了這種文化的重要部分。印度人、非洲人、阿拉伯人、中國人和毛利人學習了法語、英語和西班牙語。他們開始相信人權和自決原則，並採納了西方意識形態，如自由主義、資本主義、共產主義、女權主義和民族主義。

The Imperial Cycle

Stage	Rome	Islam	European imperialism
A small group establishes a big empire	The Romans establish the Roman Empire	The Arabs establish the Arab caliphate	The Europeans establish the European empires
An imperial culture is forged	Graeco-Roman culture	Arab-Muslim culture	Western culture
The imperial culture is adopted by the subject peoples	The subject peoples adopt Latin, Roman law, Roman political ideas, etc.	The subject peoples adopt Arabic, Islam, etc.	The subject peoples adopt English and French, socialism, nationalism, human rights, etc.
The subject peoples demand equal status in the name of common imperial values	Illyrians, Gauls and Punics demand equal status with the Romans in the name of common Roman values	Egyptians, Iranians and Berbers demand equal status with the Arabs in the name of common Muslim values	Indians, Chinese and Africans demand equal status with Europeans in the name of common Western values such as nationalism, socialism and human rights

The empire's founders lose their dominance	Romans cease to exist as a unique ethnic group. Control of the empire passes to a new multi-ethnic elite	Arabs lose control of the Muslim world, in favour of a multi-ethnic Muslim elite	Europeans lose control of the global world, in favour of a multi-ethnic elite largely committed to Western values and ways of thinking
The imperial culture continues to flourish and develop	The Illyrians, Gauls and Punics continue to develop their adopted Roman culture	The Egyptians, Iranians and Berbers continue to develop their adopted Muslim culture	The Indians, Chinese, and Africans continue to develop their adopted Western culture

During the twentieth century, local groups that had adopted Western values claimed equality with their European conquerors in the name of these very values. Many anti-colonial struggles were waged under the banners of self-determination, socialism and human rights, all of which are Western legacies. Just as Egyptians, Iranians and Turks adopted and adapted the imperial culture that they inherited from the original Arab conquerors, so today's Indians, Africans and Chinese have accepted much of the imperial culture of their former Western overlords, while seeking to mould it in accordance with their needs and traditions.

Good Guys and Bad Guys in History

It is tempting to divide history neatly into good guys and bad guys, with all empires among the bad guys. For the vast majority of empires were founded on blood, and maintained their power through oppression and war. Yet most of today's cultures are based on imperial legacies. If empires are by definition bad, what does that say about us?

在20世紀，採納西方價值觀的當地群體以這些價值觀的名義要求平等，並與他們的歐洲征服者並肩戰鬥。許多反殖民主義鬥爭都以自

決、社會主義和人權的旗幟進行，這些都是西方的遺產。正如埃及人、伊朗人和土耳其人接受並改編了他們從最初的阿拉伯征服者那裡繼承的帝國文化一樣，今天的印度人、非洲人和中國人也接受了他們前西方霸主的帝國文化，並試圖按照自己的需求和傳統來塑造它。把歷史清晰地分為好人和壞人是很誘人的，其中所有帝國都是壞人。因為絕大多數的帝國都是建立在鮮血之上，並通過壓迫和戰爭維持其領域。然而，大多數今天的文化都基於帝國的遺產。如果帝國本質上是壞的，那麼這對我們意味著什麼？

There are schools of thought and political movements that seek to purge human culture of imperialism, leaving behind what they claim is a pure, authentic civilisation, untainted by sin. These ideologies are at best naïve; at worst they serve as disingenuous window-dressing for crude nationalism and bigotry. Perhaps you could make a case that some of the myriad cultures that emerged at the dawn of recorded history were pure, untouched by sin and unadulterated by other societies. But no culture since that dawn can reasonably make that claim, certainly no culture that exists now on earth. All human cultures are at least in part the legacy of empires and imperial civilisations, and no academic or political surgery can cut out the imperial legacies without killing the patient.

有一些思想學派和政治運動試圖淨化人類文化中的帝國主義，留下他們所聲稱的純淨、真正的文明，沒有被罪惡所污染。這些意識形態最多只是天真，最壞的情況下，它們因原本粗糙的民族主義和偏執而變成虛偽的掩飾。也許你可以主張一些無數文化在記錄歷史的黎明時期是純潔、未被罪惡觸碰、未被其他社會稀釋的。但是，自從那時起，沒有一種文化可以合理地主張自己仍然保留那種純淨，當然也沒有任何文化現在在地球上仍然可以這麼主張。所有人類文化至少在一部分上都是帝國和帝國文明的遺產，沒有任何學術或政治手術可以切除帝國的遺產，而不危及整個文化系統。

Think, for example, about the love-hate relationship between the independent Indian republic of today and the British Raj. The British conquest and occupation of India cost the lives of millions of Indians, and was responsible for the continuous humiliation and exploitation of hundreds of millions more. Yet many Indians adopted, with the zest of converts, Western ideas such as self-determination and human rights, and were dismayed when the British

refused to live up to their own declared values by granting native Indians either equal rights as British subjects or independence.

Nevertheless, the modern Indian state is a child of the British Empire. The British killed, injured and persecuted the inhabitants of the subcontinent, but they also united a bewildering mosaic of warring kingdoms, principalities and tribes, creating a shared national consciousness and a country that functioned more or less as a single political unit. They laid the foundations of the Indian judicial system, created its administrative structure, and built the railroad network that was critical for economic integration. Independent India adopted Western democracy, in its British incarnation, as its form of government. English is still the subcontinent's lingua franca, a neutral tongue that native speakers of Hindi, Tamil and Malayalam can use to communicate. Indians are passionate cricket players and chai (tea) drinkers, and both game and beverage are British legacies. Commercial tea farming did not exist in India until the mid-nineteenth century, when it was introduced by the British East India Company. It was the snobbish British sahibs who spread the custom of tea drinking throughout the subcontinent.

舉例來說，想想今天獨立的印度共和國和英屬印度之間的愛恨關係。英國征服和占領印度耗費了數百萬印度人的生命，並導致數以億計印度人持續受辱和被剝削。然而，許多印度人熱情地接受西方的思想，如自決和人權，並感到失望，當英國人拒絕遵守他們自己宣告的價值觀，不給予本地印度人與英國公民平等的權利或獨立。然而，現代印度國家是大英帝國的產物。英國殺害、傷害和迫害了次大陸的居民，但他們也聯合了眾多敵對的王國、公國和部落，建立了共同的民族意識和一個或多或少作為單一政治單位運作的國家。他們奠定了印度司法系統的基礎，創建了行政結構，建設了至關重要的經濟統合基礎設施——鐵路網絡。獨立的印度採用了西方民主，以其為政府形式，在英國化的印度形式中。英語仍然是次大陸的通用語言，是印地語、泰米爾語和馬拉雅拉姆語使用者之間可以用來溝通的中立語言。印度人熱衷於打板球和飲茶，這兩種活動和飲料都是英國的遺產。商業種茶在19世紀中葉之前在印度並不存在，它是由英國東印度公司引進的。是傲慢的英國薩比人在整個次大陸普及了喝茶的習慣。



28. The Chhatrapati Shivaji train station in Mumbai. It began its life as Victoria Station, Bombay. The British built it in the Neo-Gothic style that was popular in late nineteenth-century Britain. A Hindu nationalist government changed the names of both city and station, but showed no appetite for razing such a magnificent building, even if it was built by foreign oppressors .

How many Indians today would want to call a vote to divest themselves of democracy, English, the railway network, the legal system, cricket and tea on the grounds that they are imperial legacies? And if they did, wouldn't the very act of calling a vote to decide the issue demonstrate their debt to their former overlords?



29. The Taj Mahal. An example of ‘authentic’ Indian culture, or the alien creation of Muslim imperialism?

28. 孟買的查特拉帕蒂·希瓦吉火車站，它的前身是孟買的維多利亞車站。這是英國在十九世紀末流行的新哥德式風格下所建造；但即使是由外國壓迫者建造，印度教民族主義者政府也沒有拆除如此壯觀的建築，只改變了城市和火車站名稱。今天有多少印度人會要求進行投票，以便放棄脫離皇室的傳統、英語、鐵路網絡、法律體系、板球和茶葉等因殖民主義遺留下的事物呢？即使他們真的這麼做了，透過公投解決問題已經證明他們仍欠債於自己的前任統治者，不是嗎？29. 泰姬瑪哈陵，是「真正」印度文化的範例還是穆斯林帝國主義下的異族創造？

Even if we were to completely disavow the legacy of a brutal empire in the hope of reconstructing and safeguarding the ‘authentic’ cultures that preceded it, in all probability what we will be defending is nothing but the legacy of an older and no less brutal empire. Those who resent the mutilation of Indian culture by the British Raj inadvertently sanctify the legacies of the Mughal

Empire and the conquering sultanate of Delhi. And whoever attempts to rescue ‘authentic Indian culture’ from the alien influences of these Muslim empires sanctifies the legacies of the Gupta Empire, the Kushan Empire and the Maurya Empire. If an extreme Hindu nationalist were to destroy all the buildings left by the British conquerors, such as Mumbai’s main train station, what about the structures left by India’s Muslim conquerors, such as the Taj Mahal?

即使我們完全否認殘暴帝國的遺產，希望重建和保護先前的“真正”文化，很可能我們保護的只是更古老、同樣殘暴的帝國的遺產。那些憤恨英國拉賈時期對印度文化的毀壞的人，無意中神聖化莫臥兒帝國和德里征服蘇丹王國的遺產。而試圖從這些穆斯林帝國的外來影響中拯救“真正的印度文化”的人，則神聖化了古普塔帝國、庫希·恩帝國和摩揭陀帝國的遺產。如果一位極端的印度教民族主義者摧毀了所有英國征服者留下的建築，例如孟買的主要火車站，那麼，印度的穆斯林征服者留下的建築如泰姬陵呢？

Nobody really knows how to solve this thorny question of cultural inheritance. Whatever path we take, the first step is to acknowledge the complexity of the dilemma and to accept that simplistically dividing the past into good guys and bad guys leads nowhere. Unless, of course, we are willing to admit that we usually follow the lead of the bad guys.

The New Global Empire

Since around 200 BC , most humans have lived in empires. It seems likely that in the future, too, most humans will live in one. But this time the empire will be truly global. The imperial vision of dominion over the entire world could be imminent.

As the twenty-first century unfolds, nationalism is fast losing ground. More and more people believe that all of humankind is the legitimate source of political authority, rather than the members of a particular nationality, and that safeguarding human rights and protecting the interests of the entire human species should be the guiding light of politics. If so, having close to 200 independent states is a hindrance rather than a help. Since Swedes,

Indonesians and Nigerians deserve the same human rights, wouldn't it be simpler for a single global government to safeguard them?

沒有人真正知道如何解決文化傳承的這個棘手問題。無論我們走哪條路，第一步都是承認這個困境的復雜性，並接受過去不能簡單地分成好人和壞人。除非，我們願意承認我們通常遵循壞人的領導。自公元前200年以來，大多數人類生活在帝國中。未來，大多數人可能仍將生活在一個帝國中。但這一次的帝國將是真正的全球性的。統治整個世界的帝國視野可能即將到來。隨著21世紀的發展，民族主義正在迅速失去地位。越來越多的人認為，整個人類是政治權威的合法來源，而不是特定國籍的成員，保障人權和保護整個人類的利益應該是政治的指導思想。如果是這樣，擁有近200個獨立國家實際上是一種阻礙而不是一種幫助。既然瑞典人、印尼人和尼日利亞人都應該享有同樣的人權，單一的全球政府不是更能保護這些權利嗎？

The appearance of essentially global problems, such as melting ice caps, nibbles away at whatever legitimacy remains to the independent nation states. No sovereign state will be able to overcome global warming on its own. The Chinese Mandate of Heaven was given by Heaven to solve the problems of humankind. The modern Mandate of Heaven will be given by humankind to solve the problems of heaven, such as the hole in the ozone layer and the accumulation of greenhouse gases. The colour of the global empire may well be green.

As of 2014, the world is still politically fragmented, but states are fast losing their independence. Not one of them is really able to execute independent economic policies, to declare and wage wars as it pleases, or even to run its own internal affairs as it sees fit. States are increasingly open to the machinations of global markets, to the interference of global companies and NGOs, and to the supervision of global public opinion and the international judicial system. States are obliged to conform to global standards of financial behaviour, environmental policy and justice. Immensely powerful currents of capital, labour and information turn and shape the world, with a growing disregard for the borders and opinions of states.

重大全球性問題的出現，例如冰帽的融化，逐漸削弱獨立國家的正當性。沒有任何一個主權國家能夠獨力解決全球暖化的問題。中國的“天

命”是由上天賦予，用來解決人類問題。現代的“天命”將由人類賦予，用來解決天空的問題，例如臭氧層空洞和溫室氣體的積聚。全球帝國的顏色很可能是綠色的。截至2014年，世界仍然政治分裂，但國家正在快速失去其獨立性。沒有任何一個國家真正能夠執行獨立的經濟政策，隨意宣戰或發動戰爭，甚至不能根據其自己的意願運行內部事務。國家越來越容易受到全球市場策略的影響，全球公司和非政府組織的干預，以及全球公眾與國際司法體系的監管。國家被迫遵守全球金融行為、環保政策和公義的標準。資本、勞動和信息的強大潮流正在形塑和改變這個世界，對國家的邊界和意見漠不關心。

The global empire being forged before our eyes is not governed by any particular state or ethnic group. Much like the Late Roman Empire, it is ruled by a multi-ethnic elite, and is held together by a common culture and common interests. Throughout the world, more and more entrepreneurs, engineers, experts, scholars, lawyers and managers are called to join the empire. They must ponder whether to answer the imperial call or to remain loyal to their state and their people. More and more choose the empire.

眼前所打造的全球帝國並非由任何特定國家或民族統治。就像晚期羅馬帝國一樣，它由多個族群的菁英統治，并由共同的文化和共同的利益維持。在世界各地，越來越多的企業家、工程師、專家、學者、律師和經理人被召喚加入帝國。他們必須考慮是否回應帝國的號召還是忠於自己的國家和人民。越來越多的人選擇了帝國。

12

The Law of Religion

IN THE MEDIEVAL MARKET IN SAMARKAND, a city built on a Central Asian oasis, Syrian merchants ran their hands over fine Chinese silks, fierce tribesmen from the steppes displayed the latest batch of straw-haired slaves from the far west, and shopkeepers pocketed shiny gold coins imprinted with exotic scripts and the profiles of unfamiliar kings. Here, at one of that era's major crossroads between east and west, north and south, the unification of humankind was an everyday fact. The same process could be observed at work when Kublai Khan's army mustered to invade Japan in 1281. Mongol cavalrymen in skins and furs rubbed shoulders with Chinese foot soldiers in bamboo hats, drunken Korean auxiliaries picked fights with tattooed sailors from the South China Sea, engineers from Central Asia listened with dropping jaws to the tall tales of European adventurers, and all obeyed the command of a single emperor.

在沙馬爾營建於中亞綠洲的一座城市的中世紀市場中，敍利亞商人撫摸著優美的中國絲綢，來自草原的兇猛部落展示著最新批次的金髮奴隸，店主們將鮮艷的金幣收入口袋，上面印有異國文字和陌生國王的環景發行圖案。在這個東西，南北的主要十字路口之一，人類統一是每天的事實。當忽必烈汗的軍隊於1281年集結侵略日本時也可以觀察到同樣的過程。蒙古騎兵穿著毛皮，和戴著竹帽的中國步兵肩並肩站立，醉酒的韓國輔助兵與來自南海的紋身水手打鬥，來自中亞的工程師們聽著歐洲探險家的遠古故事感到驚訝，而所有人都服從於一位皇帝的命令。

Meanwhile, around the holy Ka'aba in Mecca, human unification was proceeding by other means. Had you been a pilgrim to Mecca, circling Islam's holiest shrine in the year 1300, you might have found yourself in the company of a party from Mesopotamia, their robes floating in the wind, their eyes blazing with ecstasy, and their mouths repeating one after the other the

ninety-nine names of God. Just ahead you might have seen a weather-beaten Turkish patriarch from the Asian steppes, hobbling on a stick and stroking his beard thoughtfully. To one side, gold jewellery shining against jet-black skin, might have been a group of Muslims from the African kingdom of Mali. The aroma of clove, turmeric, cardamom and sea salt would have signalled the presence of brothers from India, or perhaps from the mysterious spice islands further east.

與此同時，在麥加的聖殿周圍，人類通過其他方式實現了統一。如果您在公元1300年前往麥加朝聖，繞行伊斯蘭教神聖的聖壇，您可能會發現自己與一些來自美索不達米亞的朝聖者在一起，他們的長袍在風中飄動，眼神中帶著狂喜，並且不斷地重複著九十九個真主的名字。在前面，您可能會看到一位來自亞洲草原的風霜土耳其族族長，搖搖晃晃地倚著拐杖，深思熟慮地摸著自己的鬍子。站在一旁的可能是幾個來自非洲馬里王國的穆斯林，他們的金飾在漆黑的皮膚上閃閃發光。而且，丁香，薑黃，豆蔻和海鹽的香氣可能表示來自印度或更遠東的神秘香料群島的兄弟會出現。

Today religion is often considered a source of discrimination, disagreement and disunion. Yet, in fact, religion has been the third great unifier of humankind, alongside money and empires. Since all social orders and hierarchies are imagined, they are all fragile, and the larger the society, the more fragile it is. The crucial historical role of religion has been to give superhuman legitimacy to these fragile structures. Religions assert that our laws are not the result of human caprice, but are ordained by an absolute and supreme authority. This helps place at least some fundamental laws beyond challenge, thereby ensuring social stability.

Religion can thus be defined as *a system of human norms and values that is founded on a belief in a superhuman order*. This involves two distinct criteria:

今天，宗教通常被認為是歧視、不協調和分裂的原因。但實際上，宗教是人類的第三大統合者，與貨幣和帝國並列。由於所有社會秩序和等級都是想像出來的，因此它們都是脆弱的，而社會越大，它就越脆弱。宗教的關鍵歷史角色是給這些脆弱的結構賦予超人的合法性。宗教聲稱，我們的法律不是人的怪癖的結果，而是由絕對和至高權威下

令的。這有助於讓至少某些基本法律免於質疑，從而確保社會穩定。因此，宗教可以被定義為一個以信仰超人秩序為基礎的人類規範和價值體系。這涉及兩個不同的標準：

1. Religions hold that there is a superhuman order, which is not the product of human whims or agreements. Professional football is not a religion, because despite its many laws, rites and often bizarre rituals, everyone knows that human beings invented football themselves, and FIFA may at any moment enlarge the size of the goal or cancel the offside rule.
2. Based on this superhuman order, religion establishes norms and values that it considers binding. Many Westerners today believe in ghosts, fairies and reincarnation, but these beliefs are not a source of moral and behavioural standards. As such, they do not constitute a religion.

Despite their ability to legitimise widespread social and political orders, not all religions have actualised this potential. In order to unite under its aegis a large expanse of territory inhabited by disparate groups of human beings, a religion must possess two further qualities. First, it must espouse a *universal* superhuman order that is true always and everywhere. Second, it must insist on spreading this belief to everyone. In other words, it must be universal and missionary.

1. 宗教信仰認為存在一種超人類的秩序，而這不是人類所任意發明或者達成的結果。職業足球不是宗教，因為儘管它擁許多規則、儀式和常常讓人匪夷所思的儀式，但每個人都知道足球是人類自己發明的，而且國際足協隨時可以擴大球門大小或取消越位規則。2. 基於這種超人類的秩序，宗教建立起視為有約束力的規範與價值觀。今天，有許多西方人相信鬼魂、仙子和轉世輪迴，但這些信仰不是道德和行為標準的來源。因此，它們並不構成一種宗教。雖然宗教具備合法化普遍社會和政治秩序的能力，但並非所有宗教都實現了這一潛力。為了在一個被不同人類群體居住的大片領土下統一，宗教必須擁有兩個進一步特徵。首先，它必須支持一種真實永恆且普遍存在的超人類秩序。其次，它必須堅持傳播這種信仰給每個人。換句話說，它必須是普世且宣教的。

The best-known religions of history, such as Islam and Buddhism, are universal and missionary. Consequently people tend to believe that all religions are like them. In fact, the majority of ancient religions were local and exclusive. Their followers believed in local deities and spirits, and had no interest in converting the entire human race. As far as we know, universal and missionary religions began to appear only in the first millennium BC. Their emergence was one of the most important revolutions in history, and made a vital contribution to the unification of humankind, much like the emergence of universal empires and universal money.

Silencing the Lambs

When animism was the dominant belief system, human norms and values had to take into consideration the outlook and interests of a multitude of other beings, such as animals, plants, fairies and ghosts. For example, a forager band in the Ganges Valley may have established a rule forbidding people to cut down a particularly large fig tree, lest the fig-tree spirit become angry and take revenge. Another forager band living in the Indus Valley may have forbidden people from hunting white-tailed foxes, because a white-tailed fox once revealed to a wise old woman where the band might find precious obsidian.

歷史上最著名的宗教，像伊斯蘭教和佛教，是普遍的和傳教的。因此人們往往認為所有宗教都像他們一樣。事實上，大多數古代宗教都是當地的和排他的。他們的追隨者信仰當地的神靈和精靈，並不想要改變整個人類。據我們所知，普遍和傳教的宗教只開始出現在公元前一千年。它們的出現是歷史上最重要的革命之一，對人類的統一做出了至關重要的貢獻，就像普及的帝國和共通的貨幣出現一樣。當動物崇拜是主流信仰體系時，人類的規範和價值必須考慮到其他眾多生物（例如動物，植物，仙女和幽靈）的觀點和利益。例如，在恒河流域的採集者部落可能會制定一項禁止人們砍伐一棵特別大的無花果樹的規則，以免無花果樹精靈生氣並報復。住在印度河谷的另一個採集者部落可能會禁止人們狩獵白尾狐，因為白尾狐曾經向一位聰明的老婦人透露了部落可能找到貴重黑曜石的地方。

Such religions tended to be very local in outlook, and to emphasise the unique features of specific locations, climates and phenomena. Most foragers spent their entire lives within an area of no more than a thousand square kilometres. In order to survive, the inhabitants of a particular valley needed to understand the super-human order that regulated their valley, and to adjust their behaviour accordingly. It was pointless to try to convince the inhabitants of some distant valley to follow the same rules. The people of the Indus did not bother to send missionaries to the Ganges to convince locals not to hunt white-tailed foxes.

The Agricultural Revolution seems to have been accompanied by a religious revolution. Hunter-gatherers picked and pursued wild plants and animals, which could be seen as equal in status to *Homo sapiens*. The fact that man hunted sheep did not make sheep inferior to man, just as the fact that tigers hunted man did not make man inferior to tigers. Beings communicated with one another directly and negotiated the rules governing their shared habitat. In contrast, farmers owned and manipulated plants and animals, and could hardly degrade themselves by negotiating with their possessions. Hence the first religious effect of the Agricultural Revolution was to turn plants and animals from equal members of a spiritual round table into property.

這樣的宗教往往具有很強的地方色彩，並強調特定地點、氣候和現象的獨特特徵。大多數狩獵採集者在一千平方公里的範圍內度過整個生命。為了生存，特定谷地的居民需要理解統治谷地的超人秩序，並相應地調整自己的行為。試圖說服遠方山谷的居民遵循同樣的規則是毫無意義的。因此，印度人沒有打算派遣傳教士到恆河地區，說服當地人不要打獵白尾狐。農業革命似乎伴隨著宗教革命。狩獵採集者采摘和追逐野生植物和動物，可以視為與智人地位相等。人類獵羊並不使羊變得低劣，就像老虎獵人並不使人類低劣於老虎。各種生靈直接通過溝通並協商規則來共享棲息地。相反，農民擁有和操縱植物和動物，幾乎不能通過與他們的財產談判而使自己降格。因此，農業革命的第一個宗教效應是將植物和動物從精神圓桌的平等成員變成財產。

This, however, created a big problem. Farmers may have desired absolute control of their sheep, but they knew perfectly well that their control was limited. They could lock the sheep in pens, castrate rams and selectively breed ewes, yet they could not ensure that the ewes conceived and gave birth

to healthy lambs, nor could they prevent the eruption of deadly epidemics. How then to safeguard the fecundity of the flocks?

A leading theory about the origin of the gods argues that gods gained importance because they offered a solution to this problem. Gods such as the fertility goddess, the sky god and the god of medicine took centre stage when plants and animals lost their ability to speak, and the gods' main role was to mediate between humans and the mute plants and animals. Much of ancient mythology is in fact a legal contract in which humans promise everlasting devotion to the gods in exchange for mastery over plants and animals – the first chapters of the book of Genesis are a prime example. For thousands of years after the Agricultural Revolution, religious liturgy consisted mainly of humans sacrificing lambs, wine and cakes to divine powers, who in exchange promised abundant harvests and fecund flocks.

然而，這產生了一個大問題。農民可能渴望對他們的羊有絕對的掌控權，但他們非常清楚，他們的控制是有限的。他們可以把羊鎖在圍欄裡，閹割公羊並選擇性地繁殖母羊，但他們無法確保母羊受孕、分娩健康的小羊，也無法防止致命的疫情爆發。那麼，如何保障羊群的繁殖力呢？關於神的起源的一種主流理論認為，神之所以變得重要，是因為它們提供了解決這個問題的方法。如生育女神、天空神和醫神等，當植物和動物失去了說話的能力時，它們就成為了中心角色，而神的主要角色是在人類和啞植物動物之間進行調解。事實上，古代神話的大部分內容其實是一份法律合同，其中人類承諾永遠奉獻自己給神，以換取對植物和動物的主權——《創世紀》的前幾章就是一個典型的例子。在農業革命之後的數千年裡，宗教儀式主要是人類為神犧牲羊、酒和蛋糕，以換取豐收和繁殖群。

The Agricultural Revolution initially had a far smaller impact on the status of other members of the animist system, such as rocks, springs, ghosts and demons. However, these too gradually lost status in favour of the new gods. As long as people lived their entire lives within limited territories of a few hundred square kilometres, most of their needs could be met by local spirits. But once kingdoms and trade networks expanded, people needed to contact entities whose power and authority encompassed a whole kingdom or an entire trade basin.

The attempt to answer these needs led to the appearance of polytheistic religions (from the Greek: *poly* = many, *theos* = god). These religions understood the world to be controlled by a group of powerful gods, such as the fertility goddess, the rain god and the war god. Humans could appeal to these gods and the gods might, if they received devotions and sacrifices, deign to bring rain, victory and health.

農業革命最初對其他動物系統成員（如岩石，泉水，鬼魂和惡魔）的地位影響相對較小。然而，這些成員隨著新神明的崛起逐漸失去了地位。只要人們的整個生命都在區域範圍內（幾百平方公里），大多數需求都可以通過當地精靈滿足。但是，一旦王國和貿易網絡擴大，人們就需要聯繫權力和支配範圍涵蓋整個王國或整個貿易盆地的實體。為了滿足這些需求，出現了多神教（源自希臘語：*poly* = many, *theos* = god）。這些宗教認為世界由一群強大的神來控制，例如肥沃女神，雨神和戰神。人類可以向這些神明求助，如果他們得到獻祭和供奉，神明可能會帶來雨水，勝利和健康。

Animism did not entirely disappear at the advent of polytheism. Demons, fairies, ghosts, holy rocks, holy springs and holy trees remained an integral part of almost all polytheist religions. These spirits were far less important than the great gods, but for the mundane needs of many ordinary people, they were good enough. While the king in his capital city sacrificed dozens of fat rams to the great war god, praying for victory over the barbarians, the peasant in his hut lit a candle to the fig-tree fairy, praying that she help cure his sick son.

Yet the greatest impact of the rise of great gods was not on sheep or demons, but upon the status of *Homo sapiens*. Animists thought that humans were just one of many creatures inhabiting the world. Polytheists, on the other hand, increasingly saw the world as a reflection of the relationship between gods and humans. Our prayers, our sacrifices, our sins and our good deeds determined the fate of the entire ecosystem. A terrible flood might wipe out billions of ants, grasshoppers, turtles, antelopes, giraffes and elephants, just because a few stupid Sapiens made the gods angry. Polytheism thereby exalted not only the status of the gods, but also that of humankind. Less fortunate members of the old animist system lost their stature and became

either extras or silent decor in the great drama of man's relationship with the gods.

泛靈論在多神教出現時並沒有完全消失。惡魔、仙女、鬼魂、聖石、聖泉和聖樹仍是幾乎所有多神教的重要部分。這些神靈比偉大的神祇重要性低得多，但對於許多普通人的世俗需求來說，它們足夠好了。在首都的國王為了戰勝野蠻人而祭祀了幾十隻肥羊時，小屋中的農夫點燃一根蠟燭向榕樹精祈求幫助治愈他生病的兒子。然而，偉大神祇的興起對綿羊或惡魔的影響並不，而是對智人的地位產生了最大的影響。泛靈論認為人類只是居住在世界上眾多生物之一。然而，多神教不斷地將世界看作是神祇和人類關係的反映。我們的祈禱、祭祀、罪惡行為和善行行為決定了整個生態系統的命運。一場可怕的洪水可能會摧毀數十億隻螞蟻、蚱蜢、龜、羚羊、長頸鹿和大象，這都是因為一些愚蠢的智人激怒了神祇。因此，多神教不僅提高了神祇的地位，也提高了人類的地位。在舊有的泛靈論體系中不幸的成員失去了地位，成為了額外的或是默默裝飾人類與神祇關係的巨大戲劇中的角色。

The Benefits of Idolatry

Two thousand years of monotheistic brainwashing have caused most Westerners to see polytheism as ignorant and childish idolatry. This is an unjust stereotype. In order to understand the inner logic of polytheism, it is necessary to grasp the central idea buttressing the belief in many gods.

Polytheism does not necessarily dispute the existence of a single power or law governing the entire universe. In fact, most polytheist and even animist religions recognised such a supreme power that stands behind all the different gods, demons and holy rocks. In classical Greek polytheism, Zeus, Hera, Apollo and their colleagues were subject to an omnipotent and all-encompassing power – Fate (Moira, Ananke). Nordic gods, too, were in thrall to fate, which doomed them to perish in the cataclysm of Ragnarök (the Twilight of the Gods). In the polytheistic religion of the Yoruba of West Africa, all gods were born of the supreme god Olodumare, and remained subject to him. In Hindu polytheism, a single principle, Atman, controls the myriad gods and spirits, humankind, and the biological and physical world.

Atman is the eternal essence or soul of the entire universe, as well as of every individual and every phenomenon.

兩千年的一神論洗腦令多數西方人視多神論為無知和幼稚的偶像崇拜，這是不公正的刻板印象。為了理解多神論的內在邏輯，有必要掌握支撐眾神信仰的核心概念。多神論並不一定否認統治整個宇宙的單一力量或法律的存在。事實上，大多數多神論和動物崇拜宗教都承認有一個至高無上的力量，站在所有不同的神、魔鬼和聖石之後。在古典希臘多神論中，宙斯、赫拉、阿波羅等等都處於萬能且無所不在的命運（莫伊拉，阿南克）的支配下。北歐諸神，也被命運所奴役，他們注定在諸神黃昏的浩劫中滅亡。在西非的尤魯巴多神論中，所有的神都是由至高神奧羅杜馬雷所生，並一直受他的支配。在印度教的多神論中，一個單一的原則——阿特曼，控制著萬神和靈魂、人類、生物和物質世界。阿特曼是整個宇宙的永恆本質或靈魂，也是每個個體和每個現象的永恆本質或靈魂。

The fundamental insight of polytheism, which distinguishes it from monotheism, is that the supreme power governing the world is devoid of interests and biases, and therefore it is unconcerned with the mundane desires, cares and worries of humans. It's pointless to ask this power for victory in war, for health or for rain, because from its all-encompassing vantage point, it makes no difference whether a particular kingdom wins or loses, whether a particular city prospers or withers, whether a particular person recuperates or dies. The Greeks did not waste any sacrifices on Fate, and Hindus built no temples to Atman.

The only reason to approach the supreme power of the universe would be to renounce all desires and embrace the bad along with the good – to embrace even defeat, poverty, sickness and death. Thus some Hindus, known as Sadhus or Sannyasis, devote their lives to uniting with Atman, thereby achieving enlightenment. They strive to see the world from the viewpoint of this fundamental principle, to realise that from its eternal perspective all mundane desires and fears are meaningless and ephemeral phenomena.

多神論的基本洞見與一神論的不同在於，統轄世界的至高權力沒有興趣和偏見，因此對人類的世俗欲望、憂慮和煩惱毫不關心。要求這股力量在戰爭中取勝、保持健康或下雨是毫無意義的；在其無所不包的

全盤觀點下，某一個王國是否勝利，某一個城市是否興旺，某一個人是否康復或死亡都無關緊要。希臘人沒有在命運上浪費任何祭品，印度人也沒有為Atman建造任何寺廟。接近宇宙至高權力的唯一原因是放棄一切渴望，接受好壞並存，甚至包容失敗、貧窮、疾病和死亡。因此，一些印度教徒，被稱為Sadhus或Sannyasis，將自己的生命奉獻於統一Atman，從而實現啟蒙。他們努力從這個基本原則的角度看待世界，認識到從它永恆的角度來看所有世俗的渴望和恐懼都是毫無意義和短暫的現象。

Most Hindus, however, are not Sadhus. They are sunk deep in the morass of mundane concerns, where Atman is not much help. For assistance in such matters, Hindus approach the gods with their partial powers. Precisely because their powers are partial rather than all-encompassing, gods such as Ganesha, Lakshmi and Saraswati have interests and biases. Humans can therefore make deals with these partial powers and rely on their help in order to win wars and recuperate from illness. There are necessarily many of these smaller powers, since once you start dividing up the all-encompassing power of a supreme principle, you'll inevitably end up with more than one deity. Hence the plurality of gods.

The insight of polytheism is conducive to far-reaching religious tolerance. Since polytheists believe, on the one hand, in one supreme and completely disinterested power, and on the other hand in many partial and biased powers, there is no difficulty for the devotees of one god to accept the existence and efficacy of other gods. Polytheism is inherently open-minded, and rarely persecutes 'heretics' and 'infidels'.

然而，大多數印度教徒都不是沙度教徒。他們深陷於俗務的泥沼中，阿特曼並不能提供多少幫助。對於此類事宜，印度教徒會求助於擁有部分力量的神靈。正因為他們的力量是部分而非全方位的，蓋內沙、慈悲之母和薩拉斯瓦蒂之類的神靈就會擁有自己的興趣和偏見。人類因此可以與這些部分性力量達成協議，依靠它們的幫助贏得戰爭並從疾病中恢復。由於最高原理的全方位力量一旦被分割，就必然會得到多個神靈，因此必須有很多這樣的小力量。因此就有眾多的神。多神教的洞見有助於達到遠門的宗教寬容。由於多神教徒一方面相信唯一至高且完全冷漠的力量，另一方面又相信許多部分性和有偏見的力

量，因此信徒接受其他神靈的存在和功效並不成問題。多神教具有開放的思想，很少迫害“異端”和“不信者”。

Even when polytheists conquered huge empires, they did not try to convert their subjects. The Egyptians, the Romans and the Aztecs did not send missionaries to foreign lands to spread the worship of Osiris, Jupiter or Huitzilopochtli (the chief Aztec god), and they certainly didn't dispatch armies for that purpose. Subject peoples throughout the empire were expected to respect the empire's gods and rituals, since these gods and rituals protected and legitimised the empire. Yet they were not required to give up their local gods and rituals. In the Aztec Empire, subject peoples were obliged to build temples for Huitzilopochtli, but these temples were built alongside those of local gods, rather than in their stead. In many cases the imperial elite itself adopted the gods and rituals of subject people. The Romans happily added the Asian goddess Cybele and the Egyptian goddess Isis to their pantheon.

即使是多神教徒征服了龐大的帝國，他們也沒有試圖去改變他們的臣民信仰。埃及人、羅馬人和阿茲特克人都沒有派遣傳教士到外地去傳講奧西里斯、朱庇特或伊茲特卡波查特利（阿茲特克的主神），他們肯定也沒有為此目的派遣軍隊。帝國內的臣民被期望尊重帝國的神靈和儀式，因為這些神靈和儀式保護和合法化了帝國存在。但他們不需要放棄自己當地的神靈和儀式。在阿茲特克帝國中，臣民被迫為伊茲特卡波查特利建造神殿，但這些神殿與當地神靈的神殿建在一起，而不是代替他們。在許多情況下，帝國精英本身採納了臣民的神靈和儀式。羅馬人樂意地將亞洲女神吉伯莉和埃及女神伊西斯加入他們的眾神中。

The only god that the Romans long refused to tolerate was the monotheistic and evangelising god of the Christians. The Roman Empire did not require the Christians to give up their beliefs and rituals, but it did expect them to pay respect to the empire's protector gods and to the divinity of the emperor. This was seen as a declaration of political loyalty. When the Christians vehemently refused to do so, and went on to reject all attempts at compromise, the Romans reacted by persecuting what they understood to be a politically subversive faction. And even this was done half-heartedly. In the 300 years from the crucifixion of Christ to the conversion of Emperor

Constantine, polytheistic Roman emperors initiated no more than four general persecutions of Christians. Local administrators and governors incited some anti-Christian violence of their own. Still, if we combine all the victims of all these persecutions, it turns out that in these three centuries, the polytheistic Romans killed no more than a few thousand Christians.¹ In contrast, over the course of the next 1,500 years, Christians slaughtered Christians by the millions to defend slightly different interpretations of the religion of love and compassion.

羅馬人唯一長期拒絕容忍的神是基督徒的唯一神和傳福音的神。羅馬帝國並不要求基督徒放棄他們的信仰和儀式，但他們必須尊重帝國的護國神和皇帝之神明。這被視為政治忠誠的聲明。當基督徒堅決拒絕這樣做時，並繼續拒絕所有妥協的嘗試，羅馬人以迫害政治顛覆勢力的方式加以對待。即使如此，這也是半心半意地做的。從基督被釘在十字架上到君士坦丁大帝皈依之時的300年中，多神論的羅馬皇帝對基督徒發動的迫害只有四次。地方行政官員和州長會激起一些反基督教的暴力事件。但是，如果我們結合這些迫害的所有受害者，就會發現在這三個世紀中，多神論的羅馬人殺害的基督徒不超過數千人。相比之下，在接下來的1500年中，為了捍衛對愛和同情宗教的微小區別的稍微不同的解釋，基督徒屠殺了數百萬基督徒。

The religious wars between Catholics and Protestants that swept Europe in the sixteenth and seventeenth centuries are particularly notorious. All those involved accepted Christ's divinity and His gospel of compassion and love. However, they disagreed about the nature of this love. Protestants believed that the divine love is so great that God was incarnated in flesh and allowed Himself to be tortured and crucified, thereby redeeming the original sin and opening the gates of heaven to all those who professed faith in Him. Catholics maintained that faith, while essential, was not enough. To enter heaven, believers had to participate in church rituals and do good deeds. Protestants refused to accept this, arguing that this quid pro quo belittles God's greatness and love. Whoever thinks that entry to heaven depends upon his or her own good deeds magnifies his own importance, and implies that Christ's suffering on the cross and God's love for humankind are not enough.

16、17世紀席捲歐洲的天主教徒和新教徒之間的宗教戰爭尤其臭名昭彰。所有人都接受耶穌的神性和他的慈悲與愛的福音。但是，他們對

這種愛的本質持不同意見。新教徒相信，神聖的愛是如此偉大，以至於神降世為肉身，容許自己被酷刑和釘十字架，從而贖回原罪並向所有信仰他的人敞開天堂的大門。天主教徒堅稱，信仰雖然必不可少，但還不夠。要進入天堂，信徒必須參與教會儀式並行善事。新教徒拒絕接受這一點，認為這種交換式的行為減低了上帝的偉大和愛。認為入天堂取決於自己的好事的人會放大自己的重要性，暗示了基督在十字架上的痛苦和上帝對人類的愛不夠。

These theological disputes turned so violent that during the sixteenth and seventeenth centuries, Catholics and Protestants killed each other by the hundreds of thousands. On 23 August 1572, French Catholics who stressed the importance of good deeds attacked communities of French Protestants who highlighted God's love for humankind. In this attack, the St Bartholomew's Day Massacre, between 5,000 and 10,000 Protestants were slaughtered in less than twenty-four hours. When the pope in Rome heard the news from France, he was so overcome by joy that he organised festive prayers to celebrate the occasion and commissioned Giorgio Vasari to decorate one of the Vatican's rooms with a fresco of the massacre (the room is currently off-limits to visitors). ²More Christians were killed by fellow Christians in those twenty-four hours than by the polytheistic Roman Empire throughout its entire existence.

這些神學爭論變得如此激烈，以至於在十六世紀和十七世紀期間，天主教徒和新教徒殺死了數以千計的人。1572年8月23日，著重於善行重要性的法國天主教徒襲擊了強調上帝對人類的愛的法國新教徒社區。在這次襲擊中，聖巴多羅費大屠殺，僅在不到二十四小時內就有五千至一萬名新教徒被屠殺。當羅馬教皇從法國聽到這個消息時，他感到非常高興，組織了慶祝活動來慶祝這個場合，並委託喬治奧·瓦沙里為梵蒂岡的一個房間裝飾一個大屠殺的壁畫（該房間目前對遊客不開放）。在那二十四小時內，比多神教的羅馬帝國的 existence期間更多的基督徒被同胞殺害。

God is One

With time some followers of polytheist gods became so fond of their particular patron that they drifted away from the basic polytheist insight.

They began to believe that their god was the only god, and that He was in fact the supreme power of the universe. Yet at the same time they continued to view Him as possessing interests and biases, and believed that they could strike deals with Him. Thus were born monotheist religions, whose followers beseech the supreme power of the universe to help them recover from illness, win the lottery and gain victory in war.

The first monotheist religion known to us appeared in Egypt, *c* 350 BC, when Pharaoh Akhenaten declared that one of the minor deities of the Egyptian pantheon, the god Aten, was, in fact, the supreme power ruling the universe. Akhenaten institutionalised the worship of Aten as the state religion and tried to check the worship of all other gods. His religious revolution, however, was unsuccessful. After his death, the worship of Aten was abandoned in favour of the old pantheon.

隨著時間的流逝，一些多神教信徒對自己特定的守護神愈加喜愛，因而偏離了基本的多神論洞見。他們開始相信他們的神是唯一的神，並且他是宇宙的至高力量。然而，同時他們繼續認為他擁有利益和偏見，並相信他們可以與他達成協議。這樣，一些一神論宗教就應運而生了。他們的信徒請求宇宙至高力量幫助他們從疾病中康復，贏得彩票，以及在戰爭中取得勝利。我們所知道的第一個一神論宗教出現在公元前350年前後的埃及，當時法老艾赫納頓宣布埃及眾神中的一位次要神祇-阿頓神，實際上是統治宇宙的至高力量。艾赫納頓將阿頓的崇拜建立為國教，并試圖抑制所有其他神的崇拜。然而，他的宗教改革是失敗的。他去世後，人們放棄了阿頓的崇拜，重新崇拜舊的眾神。

Polytheism continued to give birth here and there to other monotheist religions, but they remained marginal, not least because they failed to digest their own universal message. Judaism, for example, argued that the supreme power of the universe has interests and biases, yet His chief interest is in the tiny Jewish nation and in the obscure land of Israel. Judaism had little to offer other nations, and throughout most of its existence it has not been a missionary religion. This stage can be called the stage of 'local monotheism'.

The big breakthrough came with Christianity. This faith began as an esoteric Jewish sect that sought to convince Jews that Jesus of Nazareth was their long-awaited messiah. However, one of the sect's first leaders, Paul of

Tarsus, reasoned that if the supreme power of the universe has interests and biases, and if He had bothered to incarnate Himself in the flesh and to die on the cross for the salvation of humankind, then this is something everyone should hear about, not just Jews. It was thus necessary to spread the good word – the gospel – about Jesus throughout the world.

多神论在各地诞生了其他一神论宗教，但它们仍然是边缘化的，因为它们未能消化自己的普世信息。例如，犹太教认为宇宙的至高权力有利益和偏见，但他的主要利益在于微小的犹太国家和默默无闻的以色列土地。犹太教对其他国家提供的帮助很少，而且在其大部分存在期间，犹太教并不是一种传教宗教。这个阶段可以称为“本地一神论”的阶段。基督教的重大突破是在这个阶段出现的。这种信仰起初是一个寻求说服犹太人拥护拿撒勒的耶稣是他们期盼已久的弥赛亚的秘教犹太教的派别。但该派别的首领之一，大数令的保罗，推理出，如果宇宙的至高权力有利益和偏见，如果他已经费劲心思地成肉身并且死在十字架上拯救人类，那么每个人都应该了解这个好消息，而不仅仅是犹太人。因此，有必要在全世界传播有关耶稣的喜讯 - 圣经。

Paul's arguments fell on fertile ground. Christians began organising widespread missionary activities aimed at all humans. In one of history's strangest twists, this esoteric Jewish sect took over the mighty Roman Empire.

Christian success served as a model for another monotheist religion that appeared in the Arabian peninsula in the seventh century – Islam. Like Christianity, Islam, too, began as a small sect in a remote corner of the world, but in an even stranger and swifter historical surprise it managed to break out of the deserts of Arabia and conquer an immense empire stretching from the Atlantic Ocean to India. Henceforth, the monotheist idea played a central role in world history.

Monotheists have tended to be far more fanatical and missionary than polytheists. A religion that recognises the legitimacy of other faiths implies either that its god is not the supreme power of the universe, or that it received from God just part of the universal truth. Since monotheists have usually believed that they are in possession of the entire message of the one and only God, they have been compelled to discredit all other religions. Over the last

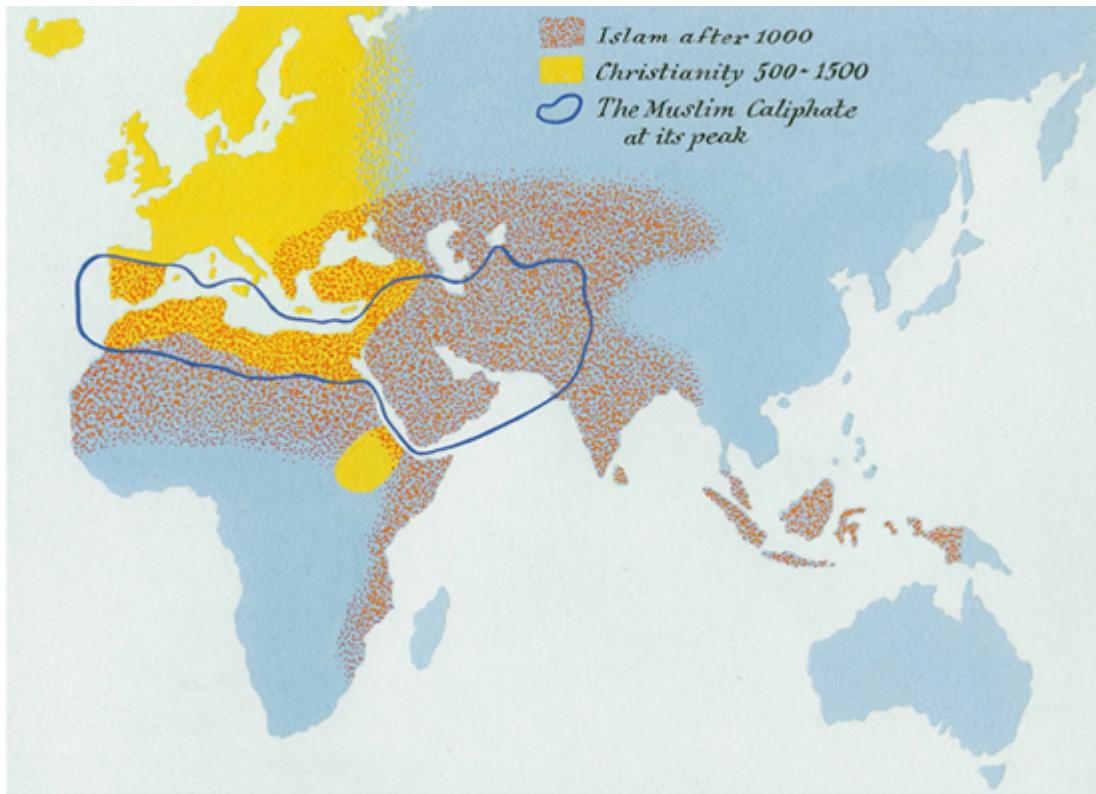
two millennia, monotheists repeatedly tried to strengthen their hand by violently exterminating all competition.

保羅的論點掀起了一股風潮。基督徒開始組織廣泛的傳教活動，旨在向所有人傳播福音。在歷史上的一個最奇妙的轉折中，這個神秘的猶太教派掌握了強大的羅馬帝國。基督教的成功為七世紀出現在阿拉伯半島上的另一個一神論宗教——伊斯蘭教提供了範例。就像基督教一樣，伊斯蘭教也始於世界偏遠的小派系，但更加奇特和迅猛的歷史驚喜是，它成功地突破了阿拉伯的沙漠，征服了一個從大西洋到印度的巨大帝國。從此，一神論觀念在世界歷史上扮演著核心角色。一神論者往往比多神論者更加狂熱和傳教。一個承認其他信仰的合法性的宗教，意味著它的神不是宇宙至高無上的力量，或者它只收到了神的部分真理。由於一神論者通常相信他們擁有唯一真神的全部信息，他們被迫譴責所有其他宗教。在過去的兩千年中，一神論者反復試圖用暴力消滅所有競爭對手，以加強自己的地位。

It worked. At the beginning of the first century AD , there were hardly any monotheists in the world. Around AD 500, one of the world's largest empires – the Roman Empire – was a Christian polity, and missionaries were busy spreading Christianity to other parts of Europe, Asia and Africa. By the end of the first millennium AD , most people in Europe, West Asia and North Africa were monotheists, and empires from the Atlantic Ocean to the Himalayas claimed to be ordained by the single great God. By the early sixteenth century, monotheism dominated most of Afro-Asia, with the exception of East Asia and the southern parts of Africa, and it began extending long tentacles towards South Africa, America and Oceania. Today most people outside East Asia adhere to one monotheist religion or another, and the global political order is built on monotheistic foundations.

這樣行得通。公元一世紀開始，全球幾乎沒有一個唯一神論者。約公元500年，世界上最大的帝國之一——羅馬帝國成為基督教政體，傳教士忙著將基督教傳播到歐洲、亞洲和非洲其他地區。到了公元一千年，歐洲、西亞和北非的大多數人都成為了一神論者，從大西洋到喜馬拉雅山的帝國都宣稱受到唯一偉大神的任命。到了16世紀初，一神論主宰了大部分非洲和亞洲地區，除了東亞和非洲南部外，它開始向南非、美洲和大洋洲延伸。今天，大多數非東亞地區的人都信奉某種一神論宗教，全球政治秩序建立在一神論的基礎上。

Yet just as animism continued to survive within polytheism, so polytheism continued to survive within monotheism. In theory, once a person believes that the supreme power of the universe has interests and biases, what's the point in worshipping partial powers? Who would want to approach a lowly bureaucrat when the president's office is open to you? Indeed, monotheist theology tends to deny the existence of all gods except the supreme God, and to pour hellfire and brimstone over anyone who dares worship them.



Map 5. The Spread of Christianity and Islam .

Yet there has always been a chasm between theological theories and historical realities. Most people have found it difficult to digest the monotheist idea fully. They have continued to divide the world into 'we' and 'they', and to see the supreme power of the universe as too distant and alien for their mundane needs. The monotheist religions expelled the gods through the front door with a lot of fanfare, only to take them back in through the side window. Christianity, for example, developed its own pantheon of saints, whose cults differed little from those of the polytheistic gods.

然而，就像泛靈論仍然存在於多神論之中一樣，多神論也繼續存在於一神論之中。理論上，一旦一個人相信宇宙的至高無上的力量有興趣和偏見，崇拜部分的力量還有什麼意義呢？誰想接近一個卑賤的官員，當總統辦公室對您開放？事實上，一神論神學傾向於否認除了至高神以外的所有神祇的存在，並對那些敢於崇拜他們的人浴火重生。

圖5. 基督教和伊斯蘭教的傳播。然而，神學理論與歷史現實之間一直存在著鴻溝。大多數人發現完全消化一神論思想非常困難。他們繼續將世界分為“我們”和“他們”，將宇宙的至高力量視為太遙遠和太陌生，無法滿足他們的世俗需求。一神論宗教通過大張旗鼓地驅逐神祇，只是要通過側門把它們重新帶回來。例如，基督教發展了自己的聖人群像，他們的崇拜與多神論的神祇幾乎沒有區別。

Just as the god Jupiter defended Rome and Huitzilopochtli protected the Aztec Empire, so every Christian kingdom had its own patron saint who helped it overcome difficulties and win wars. England was protected by St George, Scotland by St Andrew, Hungary by St Stephen, and France had St Martin. Cities and towns, professions, and even diseases – each had their own saint. The city of Milan had St Ambrose, while St Mark watched over Venice. St Florian protected chimney cleaners, whereas St Mathew lent a hand to tax collectors in distress. If you suffered from headaches you had to pray to St Agathius, but if from toothaches, then St Apollonia was a much better audience.

The Christian saints did not merely resemble the old polytheistic gods. Often they were these very same gods in disguise. For example, the chief goddess of Celtic Ireland prior to the coming of Christianity was Brigid. When Ireland was Christianised, Brigid too was baptised. She became St Brigit, who to this day is the most revered saint in Catholic Ireland.

正如教皇朱庇特保护罗马和惠特西洛普奇特利保卫阿兹特克帝国一样，每个基督教王国都有自己的主保圣人，帮助其克服困难并赢得战争。英格兰受到圣乔治的保护，苏格兰受到圣安德鲁的保护，匈牙利受到圣史蒂芬的保护，而法国则有圣马丁。城市和城镇、职业，甚至疾病-每个都有自己的圣人。米兰市有圣安博罗斯，而圣马克看守威尼斯。圣弗洛里安保护烟囱清洁工，而圣马修则帮助有困难的税收征收员。如果你头痛，你必须向圣阿加修斯祈祷，但如果你牙痛，则圣阿波罗尼娅是一个更好的选择。基督教圣人并不仅仅类似于旧的多神教

神祇。它们通常是同样的神祇伪装成的。例如，在基督教来到之前，凯尔特爱尔兰的首席女神是布里吉德。当爱尔兰成为基督教国家时，布里吉德也被洗礼了。她成为圣布里吉德，直到今天仍是天主教爱尔兰最受尊敬的圣人。

The Battle of Good and Evil

Polytheism gave birth not merely to monotheist religions, but also to dualistic ones. Dualistic religions espouse the existence of two opposing powers: good and evil. Unlike monotheism, dualism believes that evil is an independent power, neither created by the good God, nor subordinate to it. Dualism explains that the entire universe is a battleground between these two forces, and that everything that happens in the world is part of the struggle.

Dualism is a very attractive world view because it has a short and simple answer to the famous Problem of Evil, one of the fundamental concerns of human thought. ‘Why is there evil in the world? Why is there suffering? Why do bad things happen to good people?’ Monotheists have to practise intellectual gymnastics to explain how an all-knowing, all-powerful and perfectly good God allows so much suffering in the world. One well-known explanation is that this is God’s way of allowing for human free will. Were there no evil, humans could not choose between good and evil, and hence there would be no free will. This, however, is a non-intuitive answer that immediately raises a host of new questions. Freedom of will allows humans to choose evil. Many indeed choose evil and, according to the standard monotheist account, this choice must bring divine punishment in its wake. If God knew in advance that a particular person would use her free will to choose evil, and that as a result she would be punished for this by eternal tortures in hell, why did God create her? Theologians have written countless books to answer such questions. Some find the answers convincing. Some don’t. What’s undeniable is that monotheists have a hard time dealing with the Problem of Evil.

多神論不僅催生了一神論的宗教，還有二元論的宗教。二元論信奉存在兩股對立的力量：善與惡。不同於一神論，二元論認為邪惡是獨立的力量，既不由善神所創造，也不受其支配。二元論解釋整個宇宙是

這兩股力量的戰場，世上發生的一切都是這場爭鬥的一部分。二元論是一個極具吸引力的世界觀，因為它對於人類思考中一個基本問題-惡的問題，提供了簡短而簡便的答案。“為什麼世界上存在邪惡？為什麼有苦難？為什麼好人總受苦？”。一神論者必須進行脫口秀式的辯證，以解釋全知、全能、完美善良的神，為什麼會允許這麼多苦難存在。一個眾所周知的解釋是，這是上帝為允許人類自由意志而保留的方式。如果沒有邪惡，人類就無法在善與惡之間做出選擇，因此就不會有自由意志。然而，這是一個非直觀的回答，立刻引起了一系列新問題。自由意志使人類能夠選擇惡。實際上，很多人都選擇了邪惡，而根據標準的一神論解釋，這種選擇必須帶來神的懲罰。如果上帝預先知道某個人會利用自己的自由意志選擇邪惡，並因此而遭到永遠的地獄折磨，為什麼上帝還要創造她呢？神學家寫了無數的書來回答這些問題。有些人認為這些答案是有說服力的，而有些人則不這麼認為。無可否認的是，一神論者在處理“惡”的問題上遇到了困難。

For dualists, it's easy to explain evil. Bad things happen even to good people because the world is not governed single-handedly by a good God. There is an independent evil power loose in the world. The evil power does bad things.

Dualism has its own drawbacks. While solving the Problem of Evil, it is unnerved by the Problem of Order. If the world was created by a single God, it's clear why it is such an orderly place, where everything obeys the same laws. But if Good and Evil battle for control of the world, who enforces the laws governing this cosmic war? Two rival states can fight one another because both obey the same laws of physics. A missile launched from Pakistan can hit targets in India because gravity works the same way in both countries. When Good and Evil fight, what common laws do they obey, and who decreed these laws?

對於二元論者來說，解釋邪惡是很容易的。即使是善良的人也會遭受不幸，因為世界並非由一位善良的神獨自統治。世界上存在一個獨立的邪惡力量。邪惡力量會做壞事。二元論也有其不足之處。在解決邪惡問題時，也會遭遇秩序問題。如果世界是由一個神創造的，那麼為什麼這個世界是如此有秩序，一切都遵循相同的法律呢？但如果善惡爭奪世界的控制，誰會執行統治這場宇宙戰爭的法律？兩個敵對的國家可以互相戰爭，因為它們都遵循相同的物理法則。從巴基斯坦發射

的導彈可以打到印度，因為在這兩個國家中，重力的作用方式相同。當善惡戰鬥時，它們遵循哪些共同的法律，誰制定了這些法律呢？

So, monotheism explains order, but is mystified by evil. Dualism explains evil, but is puzzled by order. There is one logical way of solving the riddle: to argue that there is a single omnipotent God who created the entire universe – and He's evil. But nobody in history has had the stomach for such a belief.

Dualistic religions flourished for more than a thousand years. Sometime between 1500 BC and 1000 BC a prophet named Zoroaster (Zarathustra) was active somewhere in Central Asia. His creed passed from generation to generation until it became the most important of dualistic religions – Zoroastrianism. Zoroastrians saw the world as a cosmic battle between the good god Ahura Mazda and the evil god Angra Mainyu. Humans had to help the good god in this battle. Zoroastrianism was an important religion during the Achaemenid Persian Empire (550–330 BC) and later became the official religion of the Sassanid Persian Empire (AD 224–651). It exerted a major influence on almost all subsequent Middle Eastern and Central Asian religions, and it inspired a number of other dualist religions, such as Gnosticism and Manichaeism.

一神論解釋秩序，但卻感到神秘的邪惡。二元論解釋邪惡，但對秩序感到困惑。有一種邏輯方法可以解決這個謎題：認為有一個創造整個宇宙的全能神 - 他是邪惡的。但在歷史上沒有人能夠接受這樣的信仰。二元宗教興盛了一千多年。在公元前1500年至1000年之間，有一位名叫祖萊斯特（Zarathustra）的先知在中亞某處活躍。他的信仰代代相傳，直到成為二元宗教中最重要的一種 - 祆教。祆教認為世界是一場善神阿胡拉·馬茲達和惡神安格拉·邁尼尤之間的宇宙大戰。人類必須幫助善神打贏這場戰爭。祆教是阿契美尼德波斯帝國（公元550-330年）的一個重要宗教，後來成為薩珊波斯帝國（公元224-651年）的官方宗教。它對幾乎所有後來的中東和中亞宗教產生了重大影響，並激發了許多其他的二元宗教，如諾斯替主義和摩尼教。

During the third and fourth centuries AD, the Manichaean creed spread from China to North Africa, and for a moment it appeared that it would beat Christianity to achieve dominance in the Roman Empire. Yet the Manichaeans lost the soul of Rome to the Christians, the Zoroastrian

Sassanid Empire was overrun by the monotheistic Muslims, and the dualist wave subsided. Today only a handful of dualist communities survive in India and the Middle East.

Nevertheless, the rising tide of monotheism did not really wipe out dualism. Jewish, Christian and Muslim monotheism absorbed numerous dualist beliefs and practices, and some of the most basic ideas of what we call ‘monotheism’ are, in fact, dualist in origin and spirit. Countless Christians, Muslims and Jews believe in a powerful evil force – like the one Christians call the Devil or Satan – who can act independently, fight against the good God, and wreak havoc without God’s permission.

公元三到四世紀期间，摩尼教从中国传到北非，曾一度超越基督教成为罗马帝国的主流信仰。然而，摩尼教失去了罗马的灵魂，被基督教赶超，祆教萨珊帝国被一神论的穆斯林攻陷，双主义思潮下降。今天，仅有少数双主义社群在印度和中东存活。尽管如此，一神论的浪潮并没有真正消灭双主义。犹太教、基督教和伊斯兰教吸收了众多的双主义信仰和实践，而我们所谓的“一神论”最基本的观念之一实际上起源于双主义思想和精神。数不清的基督徒、穆斯林和犹太人相信存在一股强大的邪恶力量——就像基督教中所称的魔鬼或撒旦——它可以独立行动，与善良的上帝对抗，毁坏一切而不必获得上帝的许可。

How can a monotheist adhere to such a dualistic belief (which, by the way, is nowhere to be found in the Old Testament)? Logically, it is impossible. Either you believe in a single omnipotent God or you believe in two opposing powers, neither of which is omnipotent. Still, humans have a wonderful capacity to believe in contradictions. So it should not come as a surprise that millions of pious Christians, Muslims and Jews manage to believe at one and the same time in an omnipotent God and an independent Devil. Countless Christians, Muslims and Jews have gone so far as to imagine that the good God even needs our help in its struggle against the Devil, which inspired among other things the call for jihads and crusades.

Another key dualistic concept, particularly in Gnosticism and Manichaeanism, was the sharp distinction between body and soul, between matter and spirit. Gnostics and Manichaeans argued that the good god created the spirit and the soul, whereas matter and bodies are the creation of the evil

god. Man, according to this view, serves as a battleground between the good soul and the evil body. From a monotheistic perspective, this is nonsense – why distinguish so sharply between body and soul, or matter and spirit? And why argue that body and matter are evil? After all, everything was created by the same good God. But monotheists could not help but be captivated by dualist dichotomies, precisely because they helped them address the problem of evil. So such oppositions eventually became cornerstones of Christian and Muslim thought. Belief in heaven (the realm of the good god) and hell (the realm of the evil god) was also dualist in origin. There is no trace of this belief in the Old Testament, which also never claims that the souls of people continue to live after the death of the body.

一神論者如何堅守這樣的二元信仰呢？（順帶一提，這種信仰在舊約中根本找不到。）從邏輯上講，這是不可能的。你要么相信唯一全能的神，要么相信兩個對立的力量，而兩者都不全能。然而，人類有一種奇妙的容忍矛盾的能力。因此，數以百萬計的虔誠基督徒、穆斯林和猶太人往往能夠同時相信全能的上帝和獨立的魔鬼。無數基督徒、穆斯林和猶太人甚至認為，善良的上帝甚至需要我們的幫助來對抗魔鬼，這啟發了聖戰和十字軍東征的呼聲。另一個重要的二元概念，特別是在諾斯替主義和摩尼教中，是身體和靈魂、物質和精神之間的鮮明區別。諾斯替主義和摩尼教主張，善良的神創造了精神和靈魂，而物質和身體則是邪惡的神創造的。在這種觀點中，人類是一個善良靈魂和邪惡身體之間的戰場。從一神論的角度來看，這是荒謬的——為什麼要如此鮮明地區分身體和靈魂，或物質和精神呢？為什麼要說身體和物質是邪惡的？畢竟，一切都是同一個善良的神創造的。但一神論者無法免俗地被雙重二元對立所吸引，因為它們有助於解決邪惡問題。因此，這些對立最終成為基督教和伊斯蘭教思想的基石。相信天堂（善良神的領域）和地獄（邪惡神的領域）也是二元的起源。這種信仰在舊約中毫無痕跡，也從未聲稱人的靈魂在身體死亡後繼續生活。

In fact, monotheism, as it has played out in history, is a kaleidoscope of monotheist, dualist, polytheist and animist legacies, jumbling together under a single divine umbrella. The average Christian believes in the monotheist God, but also in the dualist Devil, in polytheist saints, and in animist ghosts. Scholars of religion have a name for this simultaneous avowal of different and even contradictory ideas and the combination of 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.

事实上，单一神论在历史上的发展是一种包括单一神、二元论、多神和精灵教的万花筒混合体，全部在一个神圣的伞下交织在一起。普通基督徒信仰单一神，但也信仰二元论的恶魔、多神的圣徒和精灵鬼魂。宗教学家称这种不同乃至相互矛盾的观念，以及来自不同渠道的仪式和实践的混合为“同化主义”。事实上，同化主义可能是全球最伟大的世界宗教。到目前为止，我们所讨论的所有宗教都共享一个重要特征：它们都聚焦于对神和其他超自然实体的信仰。对于西方人而言，这似乎是显而易见的，因为他们主要熟悉单一神和多神信仰。然而，事实上，世界宗教史并不仅仅是神的历史。公元前第一千年，一种全新的宗教开始在非洲和亚洲广泛传播。新来者，例如印度的耆那教和佛教、中国的道教和儒教以及地中海盆地的斯多icism、犬儒主义和伊壁鸠鲁主义，以对神的漠视为特点。

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 have two million want 10 million. Even the rich and famous are rarely satisfied. They too are haunted by ceaseless cares and worries, until sickness, old age and death put a bitter end to them. Everything that one has accumulated vanishes like smoke. Life is a pointless rat race. But how to escape it?

這些信仰主張，統治世界的超人類秩序是自然法則的產物，而不是神的意願和妄想。一些自然法則的宗教仍然主張存在神，但他們的神像人類、動物和植物一樣受自然規律支配。神在生態系統中有其地位，就像大象和豪豬一樣，但他們不能改變自然法則，就像大象不能一樣。其中最重要的古老自然法則宗教之一，佛教，是一個典範。佛教最重要的人物不是神，而是人類--悉達多·高塔瑪。根據佛教傳統，高塔瑪是公元前500年左右領有喜瑪拉雅山小王國的王子。年輕的王子深深被周圍的苦難所感染。他看到，男人、女人、孩子和老人，都不僅受到偶爾發生的災難，如戰爭和瘟疫的影響，而且還受到焦慮、挫折和不滿的折磨，這些似乎是人類條件不可分割的一部分。人們追求財富和權力，獲得知識和財產，生兒育女，建造房屋和宮殿。然而，不論他們取得了什麼，他們永遠不會滿足。生活在貧窮中的人夢想著財富，擁有一百萬的人想要兩百萬，擁有兩百萬的人想要一千萬。即使富有和著名的人很少感到滿足。他們也被不斷的煩惱和擔憂所困擾，直到疾病、年老和死亡像苦澀的結局一樣結束他們的生命。所有積累的東西都如煙霧般消失。生活就像毫無意義的競鼠之亂。但如何逃脫？

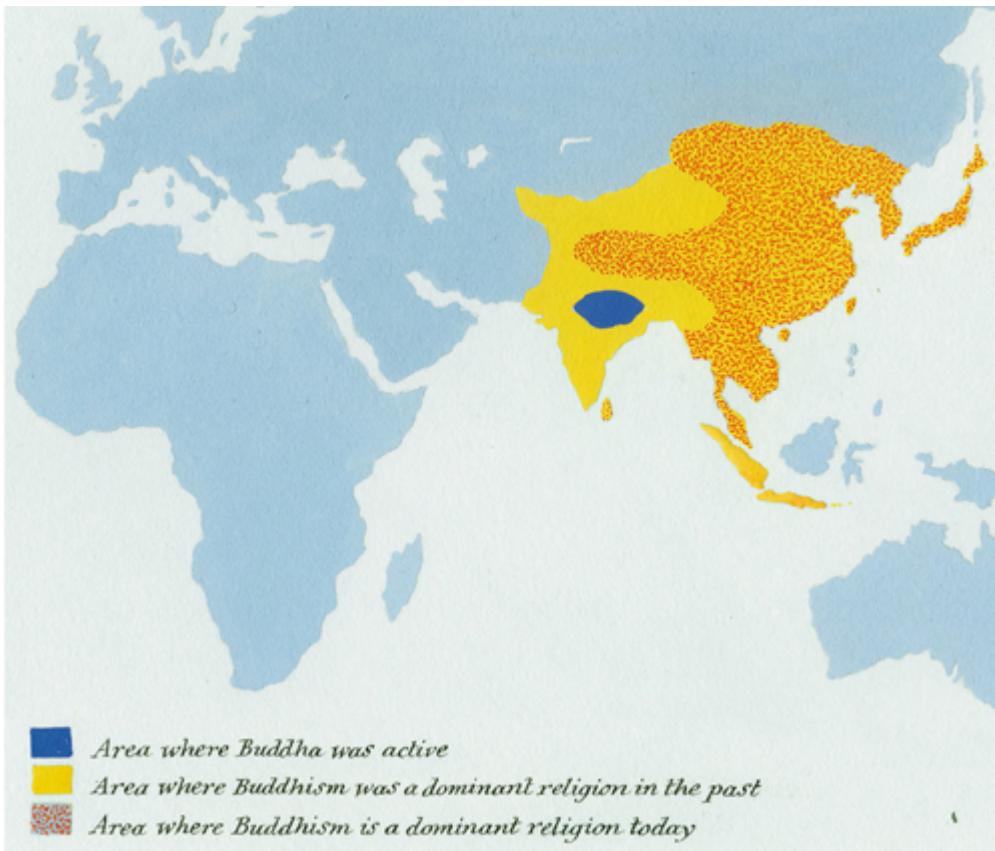
At the age of twenty-nine Gautama slipped away from his palace in the middle of the night, leaving behind his family and possessions. He travelled

as a homeless vagabond throughout northern India, searching for a way out of suffering. He visited ashrams and sat at the feet of gurus but nothing liberated him entirely – some dissatisfaction always remained. He did not despair. He resolved to investigate suffering on his own until he found a method for complete liberation. He spent six years meditating on the essence, causes and cures for human anguish. In the end he came to the realisation that suffering is not caused by ill fortune, by social injustice, or by divine whims. Rather, suffering is caused by the behaviour patterns of one's own mind.

Gautama's insight was that no matter what the mind experiences, it usually reacts with craving, and craving always involves dissatisfaction. When the mind experiences something distasteful it craves to be rid of the irritation. When the mind experiences something pleasant, it craves that the pleasure will remain and will intensify. Therefore, the mind is always dissatisfied and restless. This is very clear when we experience unpleasant things, such as pain. As long as the pain continues, we are dissatisfied and do all we can to avoid it. Yet even when we experience pleasant things we are never content. We either fear that the pleasure might disappear, or we hope that it will intensify. People dream for years about finding love but are rarely satisfied when they find it. Some become anxious that their partner will leave; others feel that they have settled cheaply, and could have found someone better. And we all know people who manage to do both.

在29歲時，高德夫人在深夜悄然離開皇宮，把家人和財產留在身後。他在印度北部成為一名無家可歸的流浪漢，尋找擺脫痛苦的方法。他參觀了修行處，跟隨大師的足跡，但總是感到不盡人意。儘管如此，他沒有灰心。他決定自己調查痛苦，直到找到一個完全自由的方法。他花了六年的時間，冥想人類苦痛的本質、成因和治療方法。最終他意識到，痛苦不是由厄運、社會不公或神的心術造成的，而是由自己的心智行為模式造成的。高德夫人獲得的領悟是，無論心智經歷什麼，它通常都會以渴望作出反應，而渴望總是包含不滿。當心智經歷到令人不快的事情時，它渴望擺脫這種煩擾。當心智經歷到令人愉悅的事情時，它渴望這種愉愽能夠持續並加強。因此，心智總是不滿和不安寧。當我們面臨令人不快的事情，例如疼痛時，這一點是非常清楚的。只要疼痛持續下去，我們就會不滿意並盡力避免它。然而，即使我們經歷了令人愉悅的事情，我們也從不感到滿足。我們或者害怕愉愽會消失，或者希望它會加強。人們夢想多年才找到愛情，但當他

們找到時，很少感到滿足。有些人擔心他們的伴侶會離開，其他人則感覺自己找了便宜，本來可以找到更好的人。我們都知道有些人兩者都做到了。



Map 6. The Spread of Buddhism .

Great gods can send us rain, social institutions can provide justice and good health care, and lucky coincidences can turn us into millionaires, but none of them can change our basic mental patterns. Hence even the greatest kings are doomed to live in angst, constantly fleeing grief and anguish, forever chasing after greater pleasures.

Gautama found that there was a way to exit this vicious circle. If, when the mind experiences something pleasant or unpleasant, it simply understands things as they are, then there is no suffering. If you experience sadness without craving that the sadness go away, you continue to feel sadness but you do not suffer from it. There can actually be richness in the sadness. If you

experience joy without craving that the joy linger and intensify, you continue to feel joy without losing your peace of mind.

地圖6：佛教的傳播。偉大的神能給我們送來雨水，社會制度能提供公義與良好的保健，幸運的機會能讓我們成為百萬富翁，但這些都無法改變我們的基本心理模式。因此，即使是最偉大的國王也注定要生活在焦慮中，不斷逃避悲傷和痛苦，永遠追逐更大的快樂。高德發現了一種逃離這個惡性循環的方法。如果當心靈體驗到愉快或不愉快的事情時，它只是簡單地理解事物真相，那麼就不會有痛苦。如果你在不渴望悲傷消失的情況下體驗悲傷，你會繼續感受到悲傷，但你不會因此而痛苦。悲傷中實際上可能存在豐富性。如果你在不渴望快樂停留和加強的情況下體驗快樂，你會在不失去內心平靜的情況下繼續感受到快樂。

But how do you get the mind to accept things as they are, without craving? To accept sadness as sadness, joy as joy, pain as pain? Gautama developed a set of meditation techniques that train the mind to experience reality as it is, without craving. These practices train the mind to focus all its attention on the question, ‘What am I experiencing now?’ rather than on ‘What would I rather be experiencing?’ It is difficult to achieve this state of mind, but not impossible.

Gautama grounded these meditation techniques in a set of ethical rules meant to make it easier for people to focus on actual experience and to avoid falling into cravings and fantasies. He instructed his followers to avoid killing, promiscuous sex and theft, since such acts necessarily stoke the fire of craving (for power, for sensual pleasure, or for wealth). When the flames are completely extinguished, craving is replaced by a state of perfect contentment and serenity, known as nirvana (the literal meaning of which is ‘extinguishing the fire’). Those who have attained nirvana are fully liberated from all suffering. They experience reality with the utmost clarity, free of fantasies and delusions. While they will most likely still encounter unpleasantness and pain, such experiences cause them no misery. A person who does not crave cannot suffer.

然而，如何讓心靈接受事情的本來面貌，不帶有渴望呢？如何接受悲傷、喜悅和痛苦呢？高童夷發展了一套冥想技巧，訓練心靈以不渴望

的方式體驗現實。這些訓練讓心靈專注於「我現在經歷了什麼？」這個問題，而不是「我想經歷什麼？」。儘管這種心態難以達成，但卻是可行的。高童夷在這些冥想技巧的基礎上建立了一套倫理規範，旨在讓人們更容易地專注於實際經驗，並避免陷入渴望和幻想中。他指示他的追隨者避免殺戮、淫亂和偷竊，因為這些行為必然激起渴望之火（對權力、感官享受或財富的渴望）。當火焰完全熄滅時，渴望便被完美滿足和平靜的狀態所取代，這種狀態被稱為涅槃（其字面含義是「熄滅的火焰」）。那些達到涅槃的人完全解脫了所有的痛苦。他們以最大的清晰度體驗現實，沒有幻想和錯覺。儘管他們仍會遇到不愉快和痛苦，但這些經驗不會讓他們感到悲慘。一個不渴望的人是不會痛苦的。

According to Buddhist tradition, Gautama himself attained nirvana and was fully liberated from suffering. Henceforth he was known as 'Buddha', which means 'The Enlightened One'. Buddha spent the rest of his life explaining his discoveries to others so that everyone could be freed from suffering. He encapsulated his teachings in a single law: suffering arises from craving; the only way to be fully liberated from suffering is to be fully liberated from craving; and the only way to be liberated from craving is to train the mind to experience reality as it is.

This law, known as *dharma* or *dhamma*, is seen by Buddhists as a universal law of nature. That 'suffering arises from craving' is always and everywhere true, just as in modern physics E always equals mc^2 . Buddhists are people who believe in this law and make it the fulcrum of all their activities. Belief in gods, on the other hand, is of minor importance to them. The first principle of monotheist religions is 'God exists. What does He want from me?' The first principle of Buddhism is 'Suffering exists. How do I escape it?'

根據佛教傳統，釋迦牟尼自己證悟涅槃，完全從痛苦中解脫出來。從此，他被稱為“佛”，意思是“覺者”。佛陀餘生都在向他人講解他的發現，以便讓每個人都能擺脫苦難。他把自己的教義總結為一個法則：“痛苦源於渴望，完全從痛苦中解脫的唯一途徑是完全從渴望中解脫出來，而從渴望中解放的唯一方式是訓練頭腦體驗現實。”這個法則被佛教徒視為自然的普世法則，就像現代物理學中的 E 總是等於 mc^2 一樣普遍適用。佛教徒是相信這個法則並將其作為所有活動的支點的人。另一方面，對他們來說，對神的信仰並不重要。一神論宗教

的第一原則是“上帝存在。他想要我做什麼？”，而佛教的第一原則是“痛苦存在。我如何逃脫？”

Buddhism does not deny the existence of gods – they are described as powerful beings who can bring rains and victories – but they have no influence on the law that suffering arises from craving. If the mind of a person is free of all craving, no god can make him miserable. Conversely, once craving arises in a person's mind, all the gods in the universe cannot save him from suffering.

Yet much like the monotheist religions, premodern natural-law religions such as Buddhism never really rid themselves of the worship of gods. Buddhism told people that they should aim for the ultimate goal of complete liberation from suffering, rather than for stops along the way such as economic prosperity and political power. However, 99 per cent of Buddhists did not attain nirvana, and even if they hoped to do so in some future lifetime, they devoted most of their present lives to the pursuit of mundane achievements. So they continued to worship various gods, such as the Hindu gods in India, the Bon gods in Tibet, and the Shinto gods in Japan.

佛教並不否認神的存在 - 祂們被描述為能帶來雨和勝利的強大存在 - 但是祂們對“苦痛源於渴望”的法則沒有影響。如果一個人的心中沒有渴望，沒有神能使他不快樂。相反的，一旦渴望在一個人的心中出現，宇宙中的所有神都不能使他免於痛苦。然而，類似於一神教的宗教，先前的自然法則宗教（如佛教）從未真正擺脫崇拜神的習慣。佛教告訴人們，他們應該追求從苦難中完全解脫的最終目標，而不是追求經濟繁榮和政治權力等過程中的停留點。然而，99%的佛教徒沒有達到涅槃，即使他們希望在未來的某個生命中實現涅槃，他們仍將大部分現在的生命用於追求世俗成就。因此，他們繼續崇拜各種神，如印度的印度教神、西藏的波恩教神和日本的神道教神。

Moreover, as time went by several Buddhist sects developed pantheons of Buddhas and bodhisattvas. These are human and non-human beings with the capacity to achieve full liberation from suffering but who forego this liberation out of compassion, in order to help the countless beings still trapped in the cycle of misery. Instead of worshipping gods, many Buddhists began worshipping these enlightened beings, asking them for help not only in

attaining nirvana, but also in dealing with mundane problems. Thus we find many Buddhas and bodhisattvas throughout East Asia who spend their time bringing rain, stopping plagues, and even winning bloody wars – in exchange for prayers, colourful flowers, fragrant incense and gifts of rice and candy.

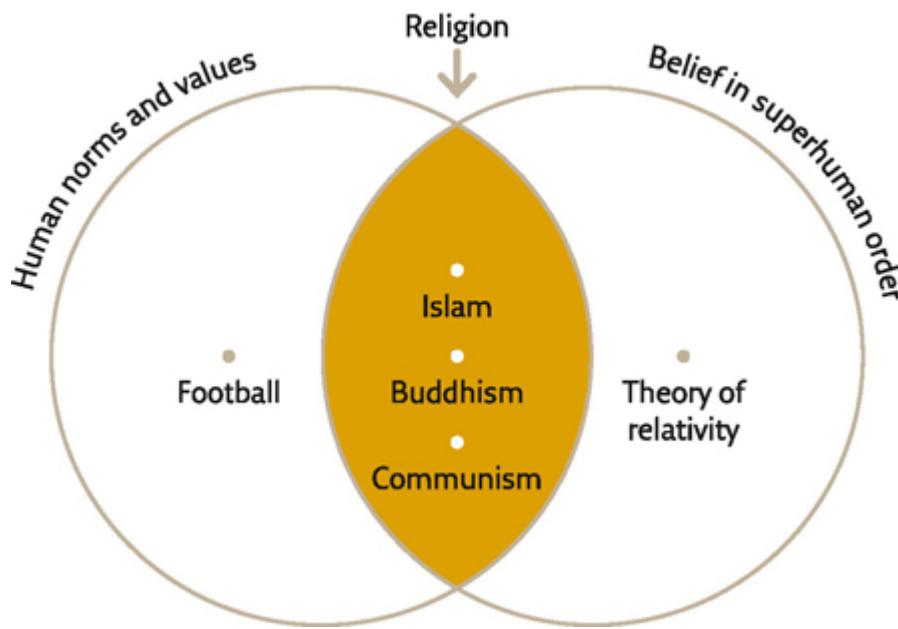
The Worship of Man

The last 300 years are often depicted as an age of growing secularism, in which religions have increasingly lost their importance. If we are talking about theist religions, this is largely correct. But if we take into consideration natural-law religions, then modernity turns out to be an age of intense religious fervour, unparalleled missionary efforts, and the bloodiest wars of religion in history. The modern age has witnessed the rise of a number of new natural-law religions, such as liberalism, Communism, capitalism, nationalism and Nazism. These creeds do not like to be called religions, and refer to themselves as ideologies. But this is just a semantic exercise. If a religion is a system of human norms and values that is founded on belief in a superhuman order, then Soviet Communism was no less a religion than Islam.

此外，隨著時間的推移，幾個佛教教派發展出許多諸佛諸菩薩的神祇。這些神祇是有能力從苦難中得到完全解脫的人類和非人類存在，但是出於慈悲，他們放棄了這種解脫，以幫助還被困在苦難循環中的無數眾生。許多佛教徒開始敬奉這些開悟的存在，不僅向他們祈求達到涅槃的幫助，而且還希望得到解決凡俗問題的幫助。因此，我們在東亞可以看到許多佛陀和菩薩，他們花費時間為大地帶來雨水、阻止瘟疫，甚至贏得血腥戰爭——作為祈禱、彩色鮮花、芳香香料和米糖等禮物的交換。過去的300年經常被描繪為一個日益世俗化、宗教越來越不重要的時代。如果我們談論有神論的宗教，這基本上是正確的。但是如果我們考慮自然法則的宗教，那麼現代就是一個充滿宗教狂熱、前所未有的傳教行動和最血腥的宗教戰爭的時代。現代見證了一些新的自然法則宗教的興起，例如自由主義、共產主義、資本主義、民族主義和納粹主義。這些信仰不喜歡被稱為宗教，而是自稱為意識形態。但這只是一個語義上的演練。如果宗教是一個基於對超人秩序的信仰而建立的人類規範和價值體系，則蘇聯共產主義和伊斯蘭教一樣都是一種宗教。

Islam is of course different from Communism, because Islam sees the superhuman order governing the world as the edict of an omnipotent creator god, whereas Soviet Communism did not believe in gods. But Buddhism too gives short shrift to gods, and yet we commonly classify it as a religion. Like Buddhists, Communists believed in a superhuman order of natural and immutable laws that should guide human actions. Whereas Buddhists believe that the law of nature was discovered by Siddhartha Gautama, Communists believed that the law of nature was discovered by Karl Marx, Friedrich Engels and Vladimir Ilyich Lenin. The similarity does not end there. Like other religions, Communism too has its holy scripts and prophetic books, such as Marx's *Das Kapital*, which foretold that history would soon end with the inevitable victory of the proletariat. Communism had its holidays and festivals, such as the First of May and the anniversary of the October Revolution. It had theologians adept at Marxist dialectics, and every unit in the Soviet army had a chaplain, called a commissar, who monitored the piety of soldiers and officers. Communism had martyrs, holy wars and heresies, such as Trotskyism. Soviet Communism was a fanatical and missionary religion. A devout Communist could not be a Christian or a Buddhist, and was expected to spread the gospel of Marx and Lenin even at the price of his or her life.

伊斯蘭教當然與共產主義不同，因為伊斯蘭教認為支配世界的超人類秩序是全能的創造者神的敕令，而蘇聯共產主義不相信神。但佛教也輕視神靈，然而我們通常將它歸為宗教。像佛教徒一樣，共產主義者相信自然和不可變的超人類秩序，應該指導人類行為。而佛教徒相信自然的法則是由悉達多·高達摩發現的，共產主義者則認為自然的法則是由卡爾·馬克思、弗利德里希·恩格斯和弗拉基米爾·伊里奇·列寧發現的。相似之處不在此止。像其他宗教一樣，共產主義也有其神聖的文獻和預言性的書籍，例如馬克思的《資本論》，預言歷史很快將以無可避免的無產階級勝利來結束。共產主義有自己的節日和慶祝活動，例如五一勞動節和十月革命紀念日。共產主義有精通馬克思主義辯證法的神學家，蘇聯軍隊中的每個單位都有一個監督士兵和軍官虔誠度的教士，稱為委員。共產主義有烈士、聖戰和異端邪說，例如托洛茨基主義。蘇聯共產主義是一個著迷和傳教的宗教。一個虔誠的共產黨人不能是基督教徒或佛教徒，並且期望他或她在任何代價下傳播馬克思和列寧的福音。



Religion is a system of human norms and values that is founded on belief in a superhuman order. The theory of relativity is not a religion, because (at least so far) there are no human norms and values that are founded on it. Football is not a religion because nobody argues that its rules reflect superhuman edicts. Islam, Buddhism and Communism are all religions, because all are systems of human norms and values that are founded on belief in a superhuman order. (Note the difference between ‘superhuman’ and ‘supernatural’. The Buddhist law of nature and the Marxist laws of history are superhuman, since they were not legislated by humans. Yet they are not supernatural.)

Some readers may feel very uncomfortable with this line of reasoning. If it makes you feel better, you are free to go on calling Communism an ideology rather than a religion. It makes no difference. We can divide creeds into god-centred religions and godless ideologies that claim to be based on natural laws. But then, to be consistent, we would need to catalogue at least some Buddhist, Daoist and Stoic sects as ideologies rather than religions. Conversely, we should note that belief in gods persists within many modern ideologies, and that some of them, most notably liberalism, make little sense without this belief.

宗教是一個基於對超人秩序的信仰而建立的人類規範和價值觀系統。相對論不是宗教，因為（至少目前為止）沒有基於它的人類規範和價

值觀。足球也不是宗教，因為沒有人主張其規則反映超自然的法令。伊斯蘭教、佛教和共產主義都是宗教，因為它們都是基於對超人秩序的信仰而建立的人類規範和價值觀系統。（要注意“超人”和“超自然”的區別。佛教的自然法則和馬克思主義的歷史法則是超人的，因為它們不是由人類立法的。然而，它們並不是超自然的。）一些讀者可能對這種論證方法感到非常不舒服。如果這讓您感覺更好，您可以繼續稱共產主義為意識形態，而不是宗教。這沒有任何區別。我們可以將信仰分為以神為中心的宗教和聲稱基於自然法則的無神論意識形態。但是，為了保持一致，我們至少需要將一些佛教、道教和斯多伊學派歸為意識形態而不是宗教。相反，我們應該注意到，在許多現代意識形態中，對神的信仰仍然存在，其中一些，尤其是自由主義，沒有這種信仰是毫無意義的。

*

It would be impossible to survey here the history of all the new modern creeds, especially because there are no clear boundaries between them. They are no less syncretic than monotheism and popular Buddhism. Just as a Buddhist could worship Hindu deities, and just as a monotheist could believe in the existence of Satan, so the typical American nowadays is simultaneously a nationalist (she believes in the existence of an American nation with a special role to play in history), a free-market capitalist (she believes that open competition and the pursuit of self-interest are the best ways to create a prosperous society), and a liberal humanist (she believes that humans have been endowed by their creator with certain inalienable rights). Nationalism will be discussed in [Chapter 18](#). Capitalism – the most successful of the modern religions – gets a whole chapter, [Chapter 16](#), which expounds its principal beliefs and rituals. In the remaining pages of this chapter I will address the humanist religions.

在此，我們無法調查所有新現代信仰的歷史，特別是因為它們之間沒有明確的界限。它們不比一神論和普遍佛教信仰更缺乏綜合性。就像佛教徒可以崇拜印度教的神明，一神論者可以相信撒但的存在，如今典型的美國人同時是民族主義者（她相信存在一個擁有特殊歷史使命的美國國家），自由市場資本主義者（她相信公開競爭和追求自身利益是創造繁榮社會的最佳途徑）和自由人道主義者（她相信人類授予了某些不可剝奪的權利）。民族主義將在第18章中討論。現代宗教中

最成功的資本主義得到了一整章，即第16章，陳述了它的主要信仰和儀式。在本章的其餘部分，我將討論人道主義宗教。

Theist religions focus on the worship of gods. Humanist religions worship humanity, or more correctly, *Homo sapiens*. Humanism is a belief that *Homo sapiens* has a unique and sacred nature, which is fundamentally different from the nature of all other animals and of all other phenomena. Humanists believe that the unique nature of *Homo sapiens* is the most important thing in the world, and it determines the meaning of everything that happens in the universe. The supreme good is the good of *Homo sapiens*. The rest of the world and all other beings exist solely for the benefit of this species.

All humanists worship humanity, but they do not agree on its definition. Humanism has split into three rival sects that fight over the exact definition of ‘humanity’, just as rival Christian sects fought over the exact definition of God. Today, the most important humanist sect is liberal humanism, which believes that ‘humanity’ is a quality of individual humans, and that the liberty of individuals is therefore sacrosanct. According to liberals, the sacred nature of humanity resides within each and every individual *Homo sapiens*. The inner core of individual humans gives meaning to the world, and is the source for all ethical and political authority. If we encounter an ethical or political dilemma, we should look inside and listen to our inner voice – the voice of humanity. The chief commandments of liberal humanism are meant to protect the liberty of this inner voice against intrusion or harm. These commandments are collectively known as ‘human rights’.

有神論宗教著重崇拜神明。人本主義宗教則是崇拜人性，或更準確地說，崇拜智人。人本主義是一種信仰，認為智人有獨特而神聖的本質，徹底不同於所有其他動物和現象的本質。人本主義者相信，智人的獨特本質是世界上最 important 的事情，它決定了宇宙中所有事件的意義。至高的善是智人的利益。世界上其他的所有事物和其他生物都僅僅是為了這一物種的利益而存在。所有的人本主義者都崇拜人性，但他們對其定義並不一致。人本主義已分為三派敵對的教派，他們為了“人性”的確切定義而互相爭鬥，就像敵對的基督教教派為了“神”的確切定義而戰。今天，最重要的人本主義派別是自由人本主義，它認為“人性”是個別人類的品質，因此個人自由是不可侵犯的。根據自由派的觀點，人性的神聖本質存在每一個智人的內心深處。個別人的核

心賦予了世界意義，並是所有倫理和政治權威的來源。如果我們遇到倫理或政治困境，應該往內看，聆聽我們內心的聲音——即人性的聲音。自由人本主義的首要戒律旨在保護這種內在聲音的自由不受侵犯或傷害。這些戒律被統稱為“人權”。

This, for example, is why liberals object to torture and the death penalty. In early modern Europe, murderers were thought to violate and destabilise the cosmic order. To bring the cosmos back to balance, it was necessary to torture and publicly execute the criminal, so that everyone could see the order re-established. Attending gruesome executions was a favourite pastime for Londoners and Parisians in the era of Shakespeare and Molière. In today's Europe, murder is seen as a violation of the sacred nature of humanity. In order to restore order, present-day Europeans do not torture and execute criminals. Instead, they punish a murderer in what they see as the most 'humane' way possible, thus safeguarding and even rebuilding his human sanctity. By honouring the human nature of the murderer, everyone is reminded of the sanctity of humanity, and order is restored. By defending the murderer, we right what the murderer has wronged.

例如，這就是為什麼自由派反對酷刑和死刑的原因。在早期現代歐洲，殺人犯被認為是違反和破壞宇宙秩序的。為了重新平衡宇宙，有必要折磨和公開處決罪犯，以便每個人都能看到秩序得到恢復。在莎士比亞和莫里哀時代，參加恐怖的執行是倫敦人和巴黎人的最愛娛樂活動。在今天的歐洲，殺人被看作是對人性神聖本質的侵犯。為了恢復秩序，現代歐洲人不使用酷刑和處決罪犯。相反，他們以他們認為最“人道”的方式懲罰殺人犯，從而保護甚至重建他的人性神聖性。通過尊重殺人犯的人性，每個人都被提醒人性的神聖性，秩序得到了恢復。通過保護殺人犯，我們可以彌補他們對錯誤的行為。

Even though liberal humanism sanctifies humans, it does not deny the existence of God, and is, in fact, founded on monotheist beliefs. The liberal belief in the free and sacred nature of each individual is a direct legacy of the traditional Christian belief in free and eternal individual souls. Without recourse to eternal souls and a Creator God, it becomes embarrassingly difficult for liberals to explain what is so special about individual Sapiens.

Another important sect is socialist humanism. Socialists believe that 'humanity' is collective rather than individualistic. They hold as sacred not the inner voice of each individual, but the species *Homo sapiens* as a whole. Whereas liberal humanism seeks as much freedom as possible for individual humans, socialist humanism seeks equality between all humans. According to socialists, inequality is the worst blasphemy against the sanctity of humanity, because it privileges peripheral qualities of humans over their universal essence. For example, when the rich are privileged over the poor, it means that we value money more than the universal essence of all humans, which is the same for rich and poor alike.

自由人道主義雖然尊重人類，但並不否定上帝的存在，實際上是建基於一神教信仰之上。自由人道主義相信每個人的自由和神聖，是傳統基督教信仰中自由而永恆的靈魂的直接傳承。如果沒有永恆的靈魂和造物主上帝，自由人道主義者將極其尷尬地難以解釋人類智人是何等特別。另一個重要的派別是社會人道主義。社會主義者認為「人類」是集體的而不是個人主義的。他們尊崇的不是每個人內在的聲音，而是整個智人種作為一個整體的神聖。然而自由人道主義追求的是給予個體更多自由，而社會人道主義則是追求所有人之間的平等。根據社會主義者的觀點，不平等是對人類的神聖最嚴重的褻瀆，因為它偏重人的周邊特質，而不是他們的普遍本質。例如，當富人得到優待而窮人受到壓迫的時候，這意味著我們重視金錢勝過於所有人類的普遍本質，無論他們是富裕還是貧困。

Like liberal humanism, socialist humanism is built on monotheist foundations. The idea that all humans are equal is a revamped version of the monotheist conviction that all souls are equal before God. The only humanist sect that has actually broken loose from traditional monotheism is evolutionary humanism, whose most famous representatives are the Nazis. What distinguished the Nazis from other humanist sects was a different definition of 'humanity', one deeply influenced by the theory of evolution. In contrast to other humanists, the Nazis believed that humankind is not something universal and eternal, but rather a mutable species that can evolve or degenerate. Man can evolve into superman, or degenerate into a subhuman.

The main ambition of the Nazis was to protect humankind from degeneration and encourage its progressive evolution. This is why the Nazis said that the Aryan race, the most advanced form of humanity, had to be protected and fostered, while degenerate kinds of *Homo sapiens* like Jews, Roma, homosexuals and the mentally ill had to be quarantined and even exterminated. The Nazis explained that *Homo sapiens* itself appeared when one ‘superior’ population of ancient humans evolved, whereas ‘inferior’ populations such as the Neanderthals became extinct. These different populations were at first no more than different races, but developed independently along their own evolutionary paths. This might well happen again. According to the Nazis, *Homo sapiens* had already divided into several distinct races, each with its own unique qualities. One of these races, the Aryan race, had the finest qualities – rationalism, beauty, integrity, diligence. The Aryan race therefore had the potential to turn man into superman. Other races, such as Jews and blacks, were today’s Neanderthals, possessing inferior qualities. If allowed to breed, and in particular to intermarry with Aryans, they would adulterate all human populations and doom *Homo sapiens* to extinction.

社會主義人道主義和自由人道主義一樣，是建立在一神論的基礎上。所有人類平等的觀念，是一種重新改良過的一神論信仰，即上帝眼中所有靈魂平等的信仰。唯一真正脫離傳統一神論的人道主義派系是演化人道主義，其最著名的代表是納粹。納粹與其他人道主義派系的區別在於對“人性”的定義存在明顯區別，那是深受演化論影響的結果。與其他人道主義不同，納粹認為人類不是普遍和永不變化的，而是一個可變的物種，可以進化或退化。人類可以進化為超人，也可以退化為次等人類。納粹的主要目標是保護人類不受退化，促進其逐步進化。這就是為什麼納粹說雅利安種族是最先進的人類形式，必須得到保護和培育，而像猶太人、羅姆人、同性戀和精神病患者等退化的人類類型必須被隔離甚至被消滅的原因。納粹解釋，當一個“優秀”的古代人類族群進化後，人類本身就出現了，而像尼安德特人這樣的“劣等”族群就滅絕了。這些不同的族群起初不過是不同的種族，但卻沿著獨立的進化軌跡發展。這可能會再次發生。根據納粹的說法，人類已經分裂成幾個不同的種族，每個種族都有自己獨特的特質。其中一個種族，雅利安種族，擁有最優秀的特質，包括理性主義、美麗、誠實和勤奮。因此，雅利安種族有潛力讓人類變成超人。其他種族，如猶

太人和黑人，是今天的尼安德特人，擁有次等品質。如果讓它們繁殖，特別是與雅利安人通婚，它們就會污染所有人類的族群，注定將人類推向滅絕。

Biologists have since debunked Nazi racial theory. In particular, genetic research conducted after 1945 has demonstrated that the differences between the various human lineages are far smaller than the Nazis postulated. But these conclusions are relatively new. Given the state of scientific knowledge in 1933, Nazi beliefs were hardly outside the pale. The existence of different human races, the superiority of the white race, and the need to protect and cultivate this superior race were widely held beliefs among most Western elites. Scholars in the most prestigious Western universities, using the orthodox scientific methods of the day, published studies that allegedly proved that members of the white race were more intelligent, more ethical and more skilled than Africans or Indians. Politicians in Washington, London and Canberra took it for granted that it was their job to prevent the adulteration and degeneration of the white race, by, for example, restricting immigration from China or even Italy to ‘Aryan’ countries such as the USA and Australia.

生物學家自納粹種族理論以來，已經揭示其錯誤。特別是，1945年後進行的基因研究表明，各種人類祖先之間的差異遠小於納粹所假設的。但這些結論相對較為新穎。考慮到1933年的科學知識水平，納粹的信仰並未超出範圍。存在不同的人類種族，白人種族的優越性以及需要保護和培養這一優越種族，在大多數西方精英中是普遍存在的信念。最負盛名的西方大學學者，使用當時正統的科學方法，發表研究證明，白人種族的成員比非洲人或印度人更聰明，更有道德和更有技能。華盛頓，倫敦和堪培拉的政治家預設的是，防止白人種族的混雜和惡化是他們的工作，例如限制從中國甚至義大利移民到“雅利安”國家，如美國和澳大利亞。

Humanist Religions – Religions that Worship Humanity

Liberal humanism

Socialist humanism

Evolutionary humanism

Homo sapiens has a unique and sacred nature that is fundamentally different from the nature of all other beings and phenomena. The supreme good is the good of humanity.

‘Humanity’ is individualistic and resides within each individual *Homo sapiens*.

The supreme commandment is to protect the inner core and freedom of each individual *Homo sapiens*.

‘Humanity’ is collective and resides within the species *Homo sapiens* as a whole.

The supreme commandment is to protect equality within the species *Homo sapiens*.

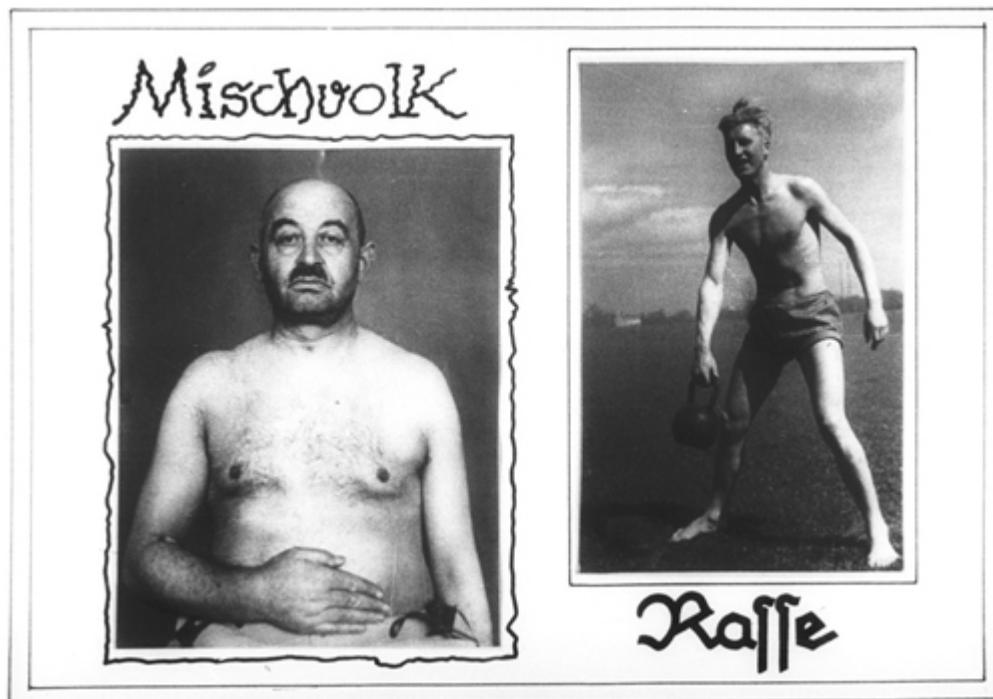
‘Humanity’ is a mutable species. Humans might degenerate into subhumans or evolve into superhumans.

The supreme commandment is to protect humankind from degenerating into subhumans, and to encourage its evolution into superhumans.

These positions did not change simply because new scientific research was published. Sociological and political developments were far more powerful engines of change. In this sense, Hitler dug not just his own grave but that of racism in general. When he launched World War Two, he compelled his enemies to make clear distinctions between ‘us’ and ‘them’. Afterwards, precisely because Nazi ideology was so racist, racism became discredited in the West. But the change took time. White supremacy remained a mainstream ideology in American politics at least until the 1960s. The White Australia policy which restricted immigration of non-white people to Australia remained in force until 1973. Aboriginal Australians did not receive equal political rights until the 1960s, and most were prevented from voting in elections because they were deemed unfit to function as citizens.

這些立場不會因為新的科學研究發表而改變。社會和政治的發展才是真正的動力源。在這方面，希特勒不僅自食其果，也讓種族主義摧毀自己。在他發動二戰時，迫使他的敵人區分「我們」和「他們」。後來，由於納粹意識形態極其種族主義，種族主義在西方變得不受信任。但這種轉變需要時間。白人至上主義至少一直是美國政治的主流意識形態，直到1960年代。限制非白人移民到澳大利亞的「白澳政

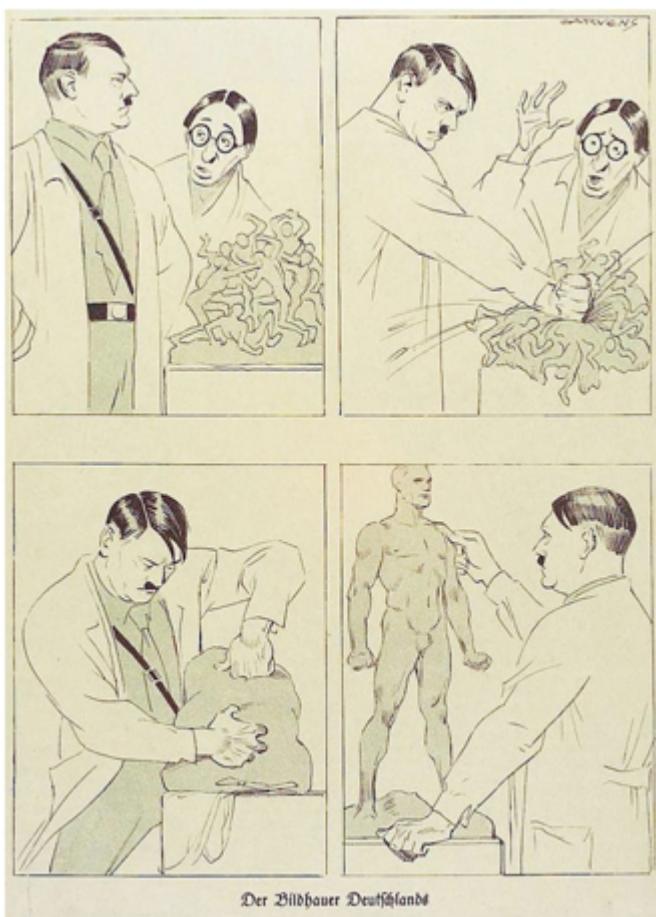
策」一直持續到1973年。直到1960年代，澳洲原住民才得到平等的政治權利，大多數原住民因被認為無法履行公民義務而被禁止投票。



30. A Nazi propaganda poster showing on the right a ‘racially pure Aryan’ and on the left a ‘cross-breed’. Nazi admiration for the human body is evident, as is their fear that the lower races might pollute humanity and cause its degeneration .

The Nazis did not loathe humanity. They fought liberal humanism, human rights and Communism precisely because they admired humanity and believed in the great potential of the human species. But following the logic of Darwinian evolution, they argued that natural selection must be allowed to weed out unfit individuals and leave only the fittest to survive and reproduce. By succouring the weak, liberalism and Communism not only allowed unfit individuals to survive, they actually gave them the opportunity to reproduce, thereby undermining natural selection. In such a world, the fittest humans would inevitably drown in a sea of unfit degenerates. Humankind would become less and less fit with each passing generation – which could lead to its extinction.

30. 一張納粹宣傳海報，在右邊展示「種族純正的雅利安人」，左邊則是「雜種」。納粹對人體崇拜明顯可見，同時也擔心低人種可能會污染人類並導致其退化。納粹並不厭惡人類。他們反對自由人道主義、人權和共產主義，正是因為他們崇拜人類並相信人類物種的巨大潛力。但根據達爾文進化論的邏輯，他們主張必須將自然選擇作用於淘汰不適者，只留下最適者生存和繁殖。自由主義和共產主義通過扶助弱者，不僅讓不適者生存下來，還讓他們有繁殖的機會，從而破壞了自然選擇。在這樣的世界裡，適者必將在不適的退化者中被淹沒。隨著時間的推移，人類會變得越來越不適應，進而可能導致滅絕。



31. A Nazi cartoon of 1933. Hitler is presented as a sculptor who creates the superman. A bespectacled liberal intellectual is appalled by the violence needed to create the superman. (Note also the erotic glorification of the human body.)

A 1942 German biology textbook explains in the chapter ‘The Laws of Nature and Mankind’ that the supreme law of nature is that all beings are locked in a remorseless struggle for survival. After describing how plants struggle for territory, how beetles struggle to find mates and so forth, the textbook concludes that:

The battle for existence is hard and unforgiving, but is the only way to maintain life. This struggle eliminates everything that is unfit for life, and selects everything that is able to survive ... These natural laws are incontrovertible; living creatures demonstrate them by their very survival. They are unforgiving. Those who resist them will be wiped out. Biology not only tells us about animals and plants, but also shows us the laws we must follow in our lives, and steels our wills to live and fight according to these laws. The meaning of life is struggle. Woe to him who sins against these laws.

31. 1933年納粹政權的漫畫。希特勒被描繪成一個創造超人的雕塑家。一位戴眼鏡的自由主義知識份子對創造超人所需的暴力感到震驚。

（請注意肉體的美化也是很重要的）1942年的德國生物學課本在“自然法則和人類”的章節中解釋，自然界的最高法則是一切生物都在不懈地爭取生存。在描述了植物如何為領土而戰、甲蟲如何為尋找配偶而戰等之後，課本得出結論：生存之戰是艱難和無情的，但這是維持生命的唯一方式。這場鬥爭淘汰了一切不适合生存的物種，選擇了一切能夠生存的物種.....這些自然法則是不容置疑的；生物的生存自身就是對這些法則最好的證明。它們是無情的。那些抵抗自然法則的人必將被消滅。生物學不僅告訴我們關於動植物的知識，還向我們展示了生活中必須遵循的法則，鞏固了我們按照這些法則生活和戰鬥的意志。生命的意義就是鬥爭。違反這些法則的人必定會倒霉。

Then follows a quotation from *Mein Kampf*: ‘The person who attempts to fight the iron logic of nature thereby fights the principles he must thank for his life as a human being. To fight against nature is to bring about one’s own destruction.’³

At the dawn of the third millennium, the future of evolutionary humanism is unclear. For sixty years after the end of the war against Hitler it was taboo to link humanism with evolution and to advocate using biological methods to

upgrade' *Homo sapiens* . But today such projects are back in vogue. No one speaks about exterminating lower races or inferior people, but many contemplate using our increasing knowledge of human biology to create superhumans.

At the same time, a huge gulf is opening between the tenets of liberal humanism and the latest findings of the life sciences, a gulf we cannot ignore much longer. Our liberal political and judicial systems are founded on the belief that every individual has a sacred inner nature, indivisible and immutable, which gives meaning to the world, and which is the source of all ethical and political authority. This is a reincarnation of the traditional Christian belief in a free and eternal soul that resides within each individual. Yet over the last 200 years, the life sciences have thoroughly undermined this belief. Scientists studying the inner workings of the human organism have found no soul there. They increasingly argue that human behaviour is determined by hormones, genes and synapses, rather than by free will – the same forces that determine the behaviour of chimpanzees, wolves, and ants. Our judicial and political systems largely try to sweep such inconvenient discoveries under the carpet. But in all frankness, how long can we maintain the wall separating the department of biology from the departments of law and political science?

隨後引用自『我的奮鬥』的一句話：“嘗試去對抗自然鐵則的人，就是去對抗使他成為人類而感恩的原則。對抗自然並意味著引發自己的毀滅。”³ 進入第三千年，進化人文主義的未來不明確。在二戰戰勝希特勒後60年，將人文主義與進化聯繫起來，並提倡使用生物學方法來升級 *Homo sapiens* 的想法一直被視為禁忌。但是今天，這些項目正在重新流行。沒有人談論消滅低等種族或下等人，但很多人正在考慮使用我們對人類生物學的增長知識來創造超人。同時，自由人文主義的原則與生命科學最新發現之間存在著巨大的分歧，我們不能再忽視這一點。我們的自由政治和司法體系源於這樣的信念：每個人都有一個神聖的內在本質，不可分割和不可改變，這賦予了世界意義，也是所有倫理和政治權威的來源。這是傳統基督教信仰的轉世，在每個人內心居住一個自由和永恆的靈魂。然而，在過去的200年裡，生命科學已經徹底瓦解了這種信仰。研究人類有機體內部運作的科學家發現，在那裡找不到靈魂。他們越來越認為，人類行為是由荷爾蒙，基因和突觸決定的，而不是自由意志——這些力量決定了黑猩猩，狼和螞蟻的行

為。我們的司法和政治體系大多嘗試將這些令人不便的發現壓制掉。但是老實說，我們能維持多久將生物學部門和法律和政治科學部門分開的牆呢？

13

The Secret of Success

COMMERCE, EMPIRES AND UNIVERSAL religions eventually brought virtually every Sapiens on every continent into the global world we live in today. Not that this process of expansion and unification was linear or without interruptions. Looking at the bigger picture, though, the transition from many small cultures to a few large cultures and finally to a single global society was probably an inevitable result of the dynamics of human history.

But saying that a global society is inevitable is not the same as saying that the end result had to be the particular kind of global society we now have. We can certainly imagine other outcomes. Why is English so widespread today, and not Danish? Why are there about 2 billion Christians and 1.25 billion Muslims, but only 150,000 Zoroastrians and no Manichaeans? If we could go back in time to 10,000 years ago and set the process going again, time after time, would we always see the rise of monotheism and the decline of dualism?

商業、帝國和普世宗教最終將幾乎每個大陸上的智人帶入了我們今天所處的全球世界。儘管這種擴張和統一的過程並非線性或沒有中斷。不過，從更大的視角來看，從許多小文化到少數大文化，最終到單一全球社會的轉變，可能是人類歷史動態的不可避免結果。但說世界性社會是不可避免的，並不等於說最終結果必須是我們現在擁有的特定類型的全球社會。我們當然可以想象其他結果。為什麼英語如此普及，而不是丹麥語？為什麼有大約20億基督徒和12.5億穆斯林，但只有15萬拜火教徒和沒有摩尼教徒？如果我們可以回到一萬年前，再一次啟動這個過程，一次又一次，我們會總是看到一神論的崛起和二元論的衰落嗎？

We can't do such an experiment, so we don't really know. But an examination of two crucial characteristics of history can provide us with some clues.

1. The Hindsight Fallacy

Every point in history is a crossroads. A single travelled road leads from the past to the present, but myriad paths fork off into the future. Some of those paths are wider, smoother and better marked, and are thus more likely to be taken, but sometimes history – or the people who make history – takes unexpected turns.

At the beginning of the fourth century AD, the Roman Empire faced a wide horizon of religious possibilities. It could have stuck to its traditional and variegated polytheism. But its emperor, Constantine, looking back on a fractious century of civil war, seems to have thought that a single religion with a clear doctrine could help unify his ethnically diverse realm. He could have chosen any of a number of contemporary cults to be his national faith – Manichaeism, Mithraism, the cults of Isis or Cybele, Zoroastrianism, Judaism and even Buddhism were all available options. Why did he opt for Jesus? Was there something in Christian theology that attracted him personally, or perhaps an aspect of the faith that made him think it would be easier to use for his purposes? Did he have a religious experience, or did some of his advisers suggest that the Christians were quickly gaining adherents and that it would be best to jump on that wagon? Historians can speculate, but not provide any definitive answer. They can describe *how* Christianity took over the Roman Empire, but they cannot explain *why* this particular possibility was realised.

我們無法進行這樣的實驗，因此我們其實不知道。但是，對歷史的兩個關鍵特徵的檢查可以為我們提供一些線索。歷史上的每一個時刻都是一個十字路口。一條旅行的道路從過去通向現在，但是無數的路徑分叉通向未來。其中一些路徑更寬，更平穩，更明確標記，因此更有可能被選擇，但有時歷史 - 或者製造歷史的人 - 會采取出人意料的轉折。在公元四世紀初，羅馬帝國面臨著廣闊的宗教可能性。它本可以堅持其傳統和多樣化的多神論。但是，其皇帝康士坦丁回顧了一個充滿內戰的世紀，似乎認為一個有明確教義的單一宗教可以幫助統一他這個種族多樣化的領域。他本可以選擇任何一個當代邪教為他的國教 - 例如摩尼教、密斯拉教、伊西斯或塞貝勒的邪教、拜火教、猶太教甚至佛教都是可行的選擇。他為什麼選擇了耶穌？是基督教神學中有

什麼吸引他個人的東西，還是信仰中有某些方面使他認為更容易用於他的目的？他是否有宗教體驗，還是一些顧問建議他基督徒正快速增加，最好跟上這輛車？歷史學家可以推測，但不能提供任何明確的答案。他們可以描述基督教如何征服了羅馬帝國，但他們無法解釋為什麼會實現這種特定的可能性。

What is the difference between describing ‘how’ and explaining ‘why’? To describe ‘how’ means to reconstruct the series of specific events that led from one point to another. To explain ‘why’ means to find causal connections that account for the occurrence of this particular series of events to the exclusion of all others.

Some scholars do indeed provide deterministic explanations of events such as the rise of Christianity. They attempt to reduce human history to the workings of biological, ecological or economic forces. They argue that there was something about the geography, genetics or economy of the Roman Mediterranean that made the rise of a monotheist religion inevitable. Yet most historians tend to be sceptical of such deterministic theories. This is one of the distinguishing marks of history as an academic discipline – the better you know a particular historical period, the *harder* it becomes to explain why things happened one way and not another. Those who have only a superficial knowledge of a certain period tend to focus only on the possibility that was eventually realised. They offer a just-so story to explain with hindsight why that outcome was inevitable. Those more deeply informed about the period are much more cognisant of the roads not taken.

「如何描述」和「為何解釋」有何區別？描述「如何」意味著重構從一個點到另一個點的一系列具體事件。解釋「為什麼」意味著找到因果關係，解釋這個特定事件序列的發生與其他事件序列無關。有些學者確實對事件提供必然性的解釋，例如基督教的興起。他們試圖將人類歷史歸納為生物、生態或經濟力量的運作。他們認為，在羅馬地中海的地理、基因或經濟上存在某些因素，使一神教的興起不可避免。但是，大多數歷史學家對這些必然論理論持懷疑態度。這是歷史作為一門學問的一個區分標誌——你對一個特定的歷史時期了解得越多，解釋為什麼事情發生一種方式而不是另一種方式就越困難。只對某個時期有膚淺了解的人往往只關注最終實現的可能性。他們提供一個隨

口說出的故事，用後見之明解釋為什麼那個結果是不可避免的。對該時期有更深入了解的人更能認識到未走的路。

In fact, the people who knew the period best – those alive at the time – were the most clueless of all. For the average Roman in Constantine's time, the future was a fog. It is an iron rule of history that what looks inevitable in hindsight was far from obvious at the time. Today is no different. Are we out of the global economic crisis, or is the worst still to come? Will China continue growing until it becomes the leading superpower? Will the United States lose its hegemony? Is the upsurge of monotheistic fundamentalism the wave of the future or a local whirlpool of little long-term significance? Are we heading towards ecological disaster or technological paradise? There are good arguments to be made for all of these outcomes, but no way of knowing for sure. In a few decades, people will look back and think that the answers to all of these questions were obvious.

實際上，那些最熟悉那個時代的人 - 那些當時還活著的人 - 最無知。對於常治時期的普通羅馬人來說，未來是一片迷霧。歷史的鐵則是，事後看來必然的事，在當時卻顯得顯而易見。今天也是如此。我們已經走出全球經濟危機了嗎？還是最壞的情況尚未到來？中國會繼續增長，直到成為領先的超級大國嗎？美國會失去霸權嗎？一神教基本主義的興起是未來的浪潮還是局部無長遠影響的漩渦？我們是否正走向生態災難還是技術天堂？對於所有這些結果都有好的論證，但沒有確定的方法。幾十年後，人們會回顧並認為所有這些問題的答案都是顯而易見的。

It is particularly important to stress that possibilities which seem very unlikely to contemporaries often get realised. When Constantine assumed the throne in 306, Christianity was little more than an esoteric Eastern sect. If you were to suggest then that it was about to become the Roman state religion, you'd have been laughed out of the room just as you would be today if you were to suggest that by the year 2050 Hare Krishna would be the state religion of the USA. In October 1913, the Bolsheviks were a small radical Russian faction. No reasonable person would have predicted that within a mere four years they would take over the country. In AD 600, the notion that a band of desert-dwelling Arabs would soon conquer an expanse stretching from the Atlantic Ocean to India was even more preposterous. Indeed, had

the Byzantine army been able to repel the initial onslaught, Islam would probably have remained an obscure cult of which only a handful of cognoscenti were aware. Scholars would then have a very easy job explaining why a faith based on a revelation to a middle-aged Meccan merchant could never have caught on.

值得強調的是，對當代人來說看來極不可能的事情往往最終會實現。306年君士坦丁登基時，基督教只不過是一個神秘的東方教派。如果你當時建議它將成為羅馬國教，你會被當時的人們嘲笑，就像今天你如果建議到2050年，哈雷克勒斯會成為美國的國教，也會遭到嘲笑一樣。1913年10月，布爾什維克只是一個小型激進派系。沒有理智的人會預測，在短短四年內他們會掌握國家。公元600年，認為一群居住在沙漠中的阿拉伯人將很快征服從大西洋到印度的領土，這更是荒謬的。事實上，如果拜占庭軍隊能夠擊退初次攻擊，伊斯蘭教可能仍然是一個只有少數內行人知道的默默無聞的教派。學者們隨後將很容易解釋，為什麼一個基於對一位中年麥加商人的啟示的信仰永遠不可能流行起來。

Not that everything is possible. Geographical, biological and economic forces create constraints. Yet these constraints leave ample room for surprising developments, which do not seem bound by any deterministic laws.

This conclusion disappoints many people, who prefer history to be deterministic. Determinism is appealing because it implies that our world and our beliefs are a natural and inevitable product of history. It is natural and inevitable that we live in nation states, organise our economy along capitalist principles, and fervently believe in human rights. To acknowledge that history is not deterministic is to acknowledge that it is just a coincidence that most people today believe in nationalism, capitalism and human rights.

History cannot be explained deterministically and it cannot be predicted because it is chaotic. So many forces are at work and their interactions are so complex that extremely small variations in the strength of the forces and the way they interact produce huge differences in outcomes. Not only that, but history is what is called a ‘level two’ chaotic system. Chaotic systems come in two shapes. Level one chaos is chaos that does not react to predictions

about it. The weather, for example, is a level one chaotic system. Though it is influenced by myriad factors, we can build computer models that take more and more of them into consideration, and produce better and better weather forecasts.

不是所有事情都可能。地理、生物和經濟力量造成了限制。儘管如此，這些限制為令人驚訝的發展留下了充分的空間，這些發展似乎沒有受到任何決定性的法則的約束。這個結論讓許多人感到失望，他們更喜歡歷史是決定論的。決定論是有吸引力的，因為它意味著我們的世界和信仰是歷史的自然並且必然的產物。我們生活在民族國家中，以資本主義原則組織我們的經濟，並熱切地相信人權是自然而然的和不可避免的。承認歷史不是決定論的，就意味著承認今天大多數人相信民族主義、資本主義和人權只是巧合。歷史不能被決定性地解釋和預測，因為它是混沌的。有太多的力量在起作用，它們的相互作用是如此複雜，即使是力量的微小變化和它們交互的方式也會產生巨大的差異。不僅如此，歷史是所謂的“二級”混沌系統。混沌系統分為兩種：一級混沌是不受關於它的預測影響的混沌。例如，天氣就是一個一級混沌系統。儘管它受到無數因素的影響，我們可以建立越來越多的計算機模型，考慮到更多的因素，並生成越來越好的天氣預報。

Level two chaos is chaos that reacts to predictions about it, and therefore can never be predicted accurately. Markets, for example, are a level two chaotic system. What will happen if we develop a computer program that forecasts with 100 per cent accuracy the price of oil tomorrow? The price of oil will immediately react to the forecast, which would consequently fail to materialise. If the current price of oil is \$90 a barrel, and the infallible computer program predicts that tomorrow it will be \$100, traders will rush to buy oil so that they can profit from the predicted price rise. As a result, the price will shoot up to \$100 a barrel today rather than tomorrow. Then what will happen tomorrow? Nobody knows.

Politics, too, is a second-order chaotic system. Many people criticise Sovietologists for failing to predict the 1989 revolutions and castigate Middle East experts for not anticipating the Arab Spring revolutions of 2011. This is unfair. Revolutions are, by definition, unpredictable. A predictable revolution never erupts.

二級混沌是對預測做出反應的混沌，因此永遠無法準確預測。例如，市場就是一個二級混沌系統。如果我們開發一個可以100%準確預測明天油價的電腦程式，那會發生什麼？油價將立即對預測做出反應，因此預測將會落空。如果當前的油價是每桶90美元，而萬無一失的電腦程式預測明天的油價是100美元，交易員將匆忙買進石油，以便從預測的價格上漲中獲利。結果，價格將在今天上漲到每桶100美元，而不是明天。那麼明天會發生什麼？沒有人知道。政治也是一個二階混沌系統。許多人批評蘇聯學家未能預測1989年的革命，並指責中東專家沒有預見2011年的阿拉伯之春。這是不公平的。革命本質上是不可預測的。可預測的革命從未爆發過。

Why not? Imagine that it's 2010 and some genius political scientists in cahoots with a computer wizard have developed an infallible algorithm that, incorporated into an attractive interface, can be marketed as a revolution predictor. They offer their services to President Hosni Mubarak of Egypt and, in return for a generous down payment, tell Mubarak that according to their forecasts a revolution would certainly break out in Egypt during the course of the following year. How would Mubarak react? Most likely, he would immediately lower taxes, distribute billions of dollars in handouts to the citizenry – and also beef up his secret police force, just in case. The pre-emptive measures work. The year comes and goes and, surprise, there is no revolution. Mubarak demands his money back. ‘Your algorithm is worthless!’ he shouts at the scientists. ‘In the end I could have built another palace instead of giving all that money away!’ ‘But the reason the revolution didn't happen is because we predicted it,’ the scientists say in their defence. ‘Prophets who predict things that don't happen?’ Mubarak remarks as he motions his guards to grab them. ‘I could have picked up a dozen of those for next to nothing in the Cairo marketplace.’

為什麼不呢？想像一下，現在是2010年，一些天才的政治科學家與電腦魔法師合作，開發了一個萬無一失的算法，融入了一個吸引人的界面，可以作為革命預測器進行市場銷售。他們向埃及總統穆巴拉克提供他們的服務，作為慷慨的頭期款，告訴穆巴拉克根據他們的預測，埃及在接下來的一年內肯定會爆發一場革命。穆巴拉克會如何反應？最有可能的是，他會立即降低稅收，向公民分發數十億美元的救濟金，並增強他的秘密警察力量，以防萬一。預防性措施起作用了。一年來來去去，出乎意料的是，沒有革命發生。穆巴拉克要求退還他的

錢。他對科學家們大聲嚷嚷：“你們的算法一文不值！最終我本可以建造另一座宮殿，而不是把所有錢都給了你們！”“但革命沒有發生的原因是因為我們預測了它，”科學家們為自己辯護道。“預測事情沒有發生的先知？”穆巴拉克說著，示意他的警衛抓住他們。“我可以在開羅市場以幾乎不花錢的代價找到一打這樣的人。”

So why study history? Unlike physics or economics, history is not a means for making accurate predictions. We study history not to know the future but to widen our horizons, to understand that our present situation is neither natural nor inevitable, and that we consequently have many more possibilities before us than we imagine. For example, studying how Europeans came to dominate Africans enables us to realise that there is nothing natural or inevitable about the racial hierarchy, and that the world might well be arranged differently.

2. Blind Clio

We cannot explain the choices that history makes, but we can say something very important about them: history's choices are not made for the benefit of humans. There is absolutely no proof that human well-being inevitably improves as history rolls along. There is no proof that cultures that are beneficial to humans must inexorably succeed and spread, while less beneficial cultures disappear. There is no proof that Christianity was a better choice than Manichaeism, or that the Arab Empire was more beneficial than that of the Sassanid Persians.

為什麼要研究歷史？與物理學或經濟學不同，歷史不是為了做出準確的預測。我們學習歷史，不是為了知道未來，而是要擴展自己的視野，了解我們目前的情況既非自然也非命中注定，因此我們擁有的可能性比我們想像的要多得多。例如，研究歐洲人如何支配非洲人使我們能夠意識到種族等級制度並非自然或不可避免的，而且世界可能會有不同的排列方式。我們無法解釋歷史所做出的選擇，但我們可以關於它們說出一些非常重要的事情：歷史的選擇並非為人類的利益而做出的。絕對沒有證據表明隨著歷史的發展，人類福祉會不斷提高。也沒有證據表明對人類有益的文化必然會成功傳播和普及，而不那麼有

益的文化就會消失。沒有證據表明基督教比摩尼教更好，或阿拉伯帝國比薩珊波斯帝國更有益。

There is no proof that history is working for the benefit of humans because we lack an objective scale on which to measure such benefit. Different cultures define the good differently, and we have no objective yardstick by which to judge between them. The victors, of course, always believe that their definition is correct. But why should we believe the victors? Christians believe that the victory of Christianity over Manichaeism was beneficial to humankind, but if we do not accept the Christian world view then there is no reason to agree with them. Muslims believe that the fall of the Sassanid Empire into Muslim hands was beneficial to humankind. But these benefits are evident only if we accept the Muslim world view. It may well be that we'd all be better off if Christianity and Islam had been forgotten or defeated.

沒有證據顯示歷史是為了人類的利益而運轉，因為我們缺乏客觀的標準來衡量這些好處。不同的文化對善的定義也不相同，因此我們沒有客觀的尺度可以判斷這些定義是否正確。當然，勝利者總是相信他們的定義是正確的。但是為什麼我們要相信勝利者呢？基督教徒相信基督教戰勝了摩尼教對人類有益，但是如果我們不接受基督教的世界觀，就沒有理由同意他們的觀點。穆斯林認為薩珊王朝轉入穆斯林之手是對人類有益的，但這些好處只有在我們接受穆斯林的世界觀時才會顯現。也許，如果基督教和伊斯蘭教已經被遺忘或被擊敗，我們都會更好。

Ever more scholars see cultures as a kind of mental infection or parasite, with humans as its unwitting host. Organic parasites, such as viruses, live inside the body of their hosts. They multiply and spread from one host to the other, feeding off their hosts, weakening them, and sometimes even killing them. As long as the hosts live long enough to pass along the parasite, it cares little about the condition of its host. In just this fashion, cultural ideas live inside the minds of humans. They multiply and spread from one host to another, occasionally weakening the hosts and sometimes even killing them. A cultural idea – such as belief in Christian heaven above the clouds or Communist paradise here on earth – can compel a human to dedicate his or her life to spreading that idea, even at the price of death. The human dies, but

the idea spreads. According to this approach, cultures are not conspiracies concocted by some people in order to take advantage of others (as Marxists tend to think). Rather, cultures are mental parasites that emerge accidentally, and thereafter take advantage of all people infected by them.

越來越多的學者認為文化是一種心理感染或寄生物，人類是其不知情的宿主。有機寄生物，如病毒，生活在宿主的身體內。它們繁殖並從一個宿主傳播到另一個宿主，以宿主為食，削弱它們，有時甚至殺死它們。只要宿主活得足夠長以傳遞寄生物，它就不會關心它的宿主狀況。文化觀念也是如此，在人類的心中存在。它們從一個宿主繁殖和傳播到另一個宿主，有時會削弱宿主，甚至殺死它們。文化觀念，例如基督教天堂在雲端上的信仰或共產主義天堂在地球上，可以迫使人們把自己的一生奉獻給傳播這個觀念，甚至以死為代價。人死了，但這個觀念卻傳播開來。根據這種方法，文化不是一些人為了利用其他人而編造的陰謀（如馬克思主義者傾向於想像的那樣）。相反，文化是意外產生的心理寄生物，隨後利用所有感染它們的人。

This approach is sometimes called memetics. It assumes that, just as organic evolution is based on the replication of organic information units called ‘genes’, so cultural evolution is based on the replication of cultural information units called ‘memes’. ¹Successful cultures are those that excel in reproducing their memes, irrespective of the costs and benefits to their human hosts.

Most scholars in the humanities disdain memetics, seeing it as an amateurish attempt to explain cultural processes with crude biological analogies. But many of these same scholars adhere to memetics’ twin sister – postmodernism. Postmodernist thinkers speak about discourses rather than memes as the building blocks of culture. Yet they too see cultures as propagating themselves with little regard for the benefit of humankind. For example, postmodernist thinkers describe nationalism as a deadly plague that spread throughout the world in the nineteenth and twentieth centuries, causing wars, oppression, hate and genocide. The moment people in one country were infected with it, those in neighbouring countries were also likely to catch the virus. The nationalist virus presented itself as being beneficial for humans, yet it has been beneficial mainly to itself.

這種方法有時被稱為模因論。它假設，就像有機進化基於被稱為“基因”的有機信息單元的復制一樣，文化進化則基於被稱為“模因”的文化信息單元的復制。成功的文化是那些在復制自己的模因方面表現出色的文化，不論對它們的人類宿主的成本和利益如何。人文學者中大多數人都不屑於模因論，認為這是一種用生物學上的粗糙比喻嘗試解釋文化進程的業餘行徑。但許多同樣的學者奉行模因論的姊妹派 - 後現代主義。後現代思想家談論的是話語而不是模因，是文化的構成要素。然而，他們也認為文化自我傳承，對人類的利益幾乎不做考慮。例如，後現代思想家把民族主義描繪成19世紀和20世紀遍布全球、引起戰爭、壓迫、仇恨和種族滅絕的致命瘟疫。當一個國家的人民被感染時，鄰國的人民也很可能感染。民族主義病毒表現出來是對人類有益的，但它主要對自己有益。

Similar arguments are common in the social sciences, under the aegis of game theory. Game theory explains how in multi-player systems, views and behaviour patterns that harm *all* players nevertheless manage to take root and spread. Arms races are a famous example. Many arms races bankrupt all those who take part in them, without really changing the military balance of power. When Pakistan buys advanced aeroplanes, India responds in kind. When India develops nuclear bombs, Pakistan follows suit. When Pakistan enlarges its navy, India counters. At the end of the process, the balance of power may remain much as it was, but meanwhile billions of dollars that could have been invested in education or health are spent on weapons. Yet the arms race dynamic is hard to resist. ‘Arms racing’ is a pattern of behaviour that spreads itself like a virus from one country to another, harming everyone, but benefiting itself, under the evolutionary criteria of survival and reproduction. (Keep in mind that an arms race, like a gene, has no awareness – it does not consciously seek to survive and reproduce. Its spread is the unintended result of a powerful dynamic.)

類似的論點在社會科學中很常見，屬於博弈論範疇。博弈論解釋了在多人系統中，傷害所有玩家的觀點和行為模式仍然能夠扎根和擴散。軍備競賽就是一個著名的例子。許多軍備競賽都會讓參與其中的所有人破產，卻無法真正改變軍事力量平衡。當巴基斯坦購買先進戰機時，印度會做出同樣的回應。當印度開發核彈時，巴基斯坦也會跟隨。當巴基斯坦擴大其海軍規模時，印度會做出反制。最終，力量平衡可能仍然保持原樣，但與此同時，本應用於教育或健康投資的數十

億美元卻花費在武器上。然而，軍備競賽的動力很難抵制。「軍備競賽」是一種行為模式，從一個國家擴散到另一個國家，傷害每個人，但在生存和繁殖的演化標準下獲益。（請記住，軍備競賽就像一個基因，沒有意識-它不會有意識地尋求生存和繁殖。它的擴散是強大動力的非故意結果。）

No matter what you call it – game theory, postmodernism or memetics – the dynamics of history are not directed towards enhancing human well-being. There is no basis for thinking that the most successful cultures in history are necessarily the best ones for *Homo sapiens*. Like evolution, history disregards the happiness of individual organisms. And individual humans, for their part, are usually far too ignorant and weak to influence the course of history to their own advantage.

History proceeds from one junction to the next, choosing for some mysterious reason to follow first this path, then another. Around AD 1500, history made its most momentous choice, changing not only the fate of humankind, but arguably the fate of all life on earth. We call it the Scientific Revolution. It began in western Europe, a large peninsula on the western tip of Afro-Asia, which up till then played no important role in history. Why did the Scientific Revolution begin there of all places, and not in China or India? Why did it begin at the midpoint of the second millennium AD rather than two centuries before or three centuries later? We don't know. Scholars have proposed dozens of theories, but none of them is particularly convincing.

無論您稱其為博弈理論、後現代主義或文化基因學，歷史的動力並非指向增強人類福祉。沒有什麼依據認為史上最成功的文化必然是對 *Homo sapiens* 最有利的。就像演化一樣，歷史忽視了個體生命的幸福。而個人，通常並不足夠聰明和強大，能夠影響歷史的軌跡以求得自己的利益。歷史從一個轉折到另一個，選擇某種神秘的原因，先走這條路，後走另一條路。約在西元1500年，歷史做出了最為重大的選擇，不僅改變了人類的命運，也可以說是改變了地球上所有生命的命運。我們稱之為科學革命。它始於西歐，一塊大陸，位於Afro-Asia的西端，直到那時在歷史上並不扮演任何重要角色。為什麼科學革命恰好始於那個地方，而不是中國或印度？為什麼在公元第二千年的中期開始，而不是兩個世紀前或三個世紀後？我們不知道。學者提出了數十種理論，但其中沒有一種特別令人信服。

History has a very wide horizon of possibilities, and many possibilities are never realised. It is conceivable to imagine history going on for generations upon generations while bypassing the Scientific Revolution, just as it is conceivable to imagine history without Christianity, without a Roman Empire, and without gold coins.

歷史有非常廣泛的可能性，而許多可能永遠不會實現。我們可以想象歷史在幾代人的時間中繼續發展，但沒有經歷科學革命，就像我們可以想象沒有基督教、沒有羅馬帝國和沒有黃金硬幣的歷史一樣。

Part Four

The Scientific Revolution



32. Alamogordo, 16 July 1945, 05:29:53. Eight seconds after the first atomic bomb was detonated. The nuclear physicist Robert Oppenheimer, upon seeing the explosion, quoted from the Bhagavadgita: ‘Now I am become Death, the destroyer of worlds.’

32. 阿拉莫戈多，1945年7月16日，05:29:53。首颗原子弹爆炸八秒后。核物理学家罗伯特·奥本海默看到爆炸后，引用了《巴格瓦德·吉达》中的话：“现在我成为死亡，世界的毁灭者。”

The Discovery of Ignorance

WERE, SAY, A SPANISH PEASANT TO HAVE fallen asleep in AD 1000 and woken up 500 years later, to the din of Columbus' sailors boarding the *Niña*, *Pinta* and *Santa María*, the world would have seemed to him quite familiar. Despite many changes in technology, manners and political boundaries, this medieval Rip Van Winkle would have felt at home. But had one of Columbus' sailors fallen into a similar slumber and woken up to the ringtone of a twenty-first-century iPhone, he would have found himself in a world strange beyond comprehension. 'Is this heaven?' he might well have asked himself. 'Or perhaps – hell?'

The last 500 years have witnessed a phenomenal and unprecedented growth in human power. In the year 1500, there were about 500 million *Homo sapiens* in the entire world. Today, there are 7 billion.¹ The total value of goods and services produced by humankind in the year 1500 is estimated at \$250 billion, in today's dollars.² Nowadays the value of a year of human production is close to \$60 trillion.³ In 1500, humanity consumed about 13 trillion calories of energy per day. Today, we consume 1,500 trillion calories a day.⁴ (Take a second look at those figures – human population has increased fourteen-fold, production 240-fold, and energy consumption 115-fold.)

如果一位西班牙農民在1000年睡著了，然後500年後在哥倫布的水手登上尼娜號、品塔號和聖瑪麗亞號時醒來，他會發現世界對他來說是相當熟悉的。儘管科技、風俗和政治界線發生了許多變化，但這位中世紀的睡美人還是會感到自在。但是，如果哥倫布的其中一個水手陷入類似的沉睡中，然後被21世紀iPhone的鈴聲叫醒，他會發現自己置身於一個無法理解的陌生世界。「這是天堂嗎？」他可能會問自己。

「或者，也許——是地獄？」過去的500年見證了人類權力的巨大和前所未有的增長。在1500年，全世界約有5億智人。今天，人口已達到

70億。1 1500年全人類生產的財貨和服務的總價值估計為今天的2500億美元。2如今，人類每年生產價值接近60萬億美元。3在1500年，人類每天消耗約13萬億卡路里的能量。今天，我們每天消耗1,500萬億卡路里。4（請再看一眼這些數字——人口增長了14倍，生產增長了240倍，能量消耗增長了115倍。）

Suppose a single modern battleship got transported back to Columbus' time. In a matter of seconds it could make driftwood out of the *Niña*, *Pinta* and *Santa María* and then sink the navies of every great world power of the time without sustaining a scratch. Five modern freighters could have taken onboard all the cargo borne by the whole world's merchant fleets.⁵ A modern computer could easily store every word and number in all the codex books and scrolls in every single medieval library with room to spare. Any large bank today holds more money than all the world's premodern kingdoms put together.⁶

In 1500, few cities had more than 100,000 inhabitants. Most buildings were constructed of mud, wood and straw; a three-storey building was a skyscraper. The streets were rutted dirt tracks, dusty in summer and muddy in winter, plied by pedestrians, horses, goats, chickens and a few carts. The most common urban noises were human and animal voices, along with the occasional hammer and saw. At sunset, the cityscape went black, with only an occasional candle or torch flickering in the gloom. If an inhabitant of such a city could see modern Tokyo, New York or Mumbai, what would she think?

假設一艘現代戰艦被傳送到哥倫布時代，僅需幾秒鐘，它就可以將尼娜號、聖瑪利亞號和皮尼塔號變成漂木，並沉沒當時世界各大強國的海軍，而自己卻完好無損。五艘現代貨輪可以裝載所有世界商船運輸的貨物。現代計算機輕鬆地可以存儲每個中世紀圖書館中卷軸和密碼書中的所有文字和數字，還有多餘的空間。現代大銀行持有的資金比所有世界前現代王國的財富總和還多。在1500年，很少有城市有超過10萬人口，大多數建築是由泥土、木材和稻草建造的。一座三層樓高的建築是摩天大樓。街道是坑坑洼洼的泥土小路，夏天灰塵飛揚，冬天泥濘不堪，行人、馬匹、山羊、雞和少量的馬車在其間穿梭。最常見的城市噪音是人聲和動物聲，偶爾有錘和鋸的聲音。日落時分，城

市景觀變黑，只有偶爾閃爍的蠟燭或火把在陰暗中顫動。如果一個城市居民能看到現代的東京、紐約或孟買，她會怎麼想？

Prior to the sixteenth century, no human had circumnavigated the earth. This changed in 1522, when Magellan's expedition returned to Spain after a journey of 72,000 kilometres. It took three years and cost the lives of almost all the crew members, Magellan included. In 1873, Jules Verne could imagine that Phileas Fogg, a wealthy British adventurer, might just be able to make it around the world in eighty days. Today anyone with a middle-class income can safely and easily circumnavigate the globe in just forty-eight hours.

In 1500, humans were confined to the earth's surface. They could build towers and climb mountains, but the sky was reserved for birds, angels and deities. On 20 July 1969 humans landed on the moon. This was not merely a historical achievement, but an evolutionary and even cosmic feat. During the previous 4 billion years of evolution, no organism managed even to leave the earth's atmosphere, and certainly none left a foot or tentacle print on the moon.

在16世紀以前，沒有人曾環遊過地球。這在1522年發生了改變，當時馬哲倫的探險隊完成了一個長達72,000公里的旅程後返回西班牙。這次旅行耗費了三年的時間，並且幾乎所有的船員都失去了性命，包括馬哲倫在內。1873年，朱爾斯·凡爾納可以想像富有的英國冒險家費利亞斯·福格可能在80天內環遊世界。如今，任何有中產階級收入的人只需48小時就可以安全輕鬆地環遊世界。在1500年，人類被限制在地球表面。他們可以建造塔樓和攀登山峰，但天空是為鳥類、天使和神明保留的。1969年7月20日，人類登陸月球。這不僅是一個歷史性的成就，還是一項進化甚至是宇宙的壯舉。在過去的40億年進化中，沒有任何生物成功離開地球的大氣層，當然也沒有在月球上留下了腳印或觸手印。

For most of history, humans knew nothing about 99.99 per cent of the organisms on the planet – namely, the microorganisms. This was not because they were of no concern to us. Each of us bears billions of one-celled creatures within us, and not just as free-riders. They are our best friends, and deadliest enemies. Some of them digest our food and clean our guts, while

others cause illnesses and epidemics. Yet it was only in 1674 that a human eye first saw a microorganism, when Anton van Leeuwenhoek took a peek through his home-made microscope and was startled to see an entire world of tiny creatures milling about in a drop of water. During the subsequent 300 years, humans have made the acquaintance of a huge number of microscopic species. We've managed to defeat most of the deadliest contagious diseases they cause, and have harnessed microorganisms in the service of medicine and industry. Today we engineer bacteria to produce medications, manufacture biofuel and kill parasites.

在大部分的歷史長河中，人類對於地球上99.99%的生物——微生物——毫不知情。這不是因為微生物對我們無關緊要，事實上，我們每個人體內都有數十億的單細胞生物，而他們不只是搭便車客，有些微生物負責消化我們的食物及清理腸道，而有些則造成疾病及流行病。不過，直到1674年，人類才第一次透過安東·范·李文虎克自製顯微鏡，看到微生物的全貌，驚覺一滴水裡竟然有無數微小生物的世界。在隨後的300年中，人類認識了大量的微生物物種，也擊敗了多數致命傳染病的源頭，並且將微生物運用在醫學及工業上。如今我們能利用細菌製造藥品，生產生物燃料及殺滅寄生蟲。

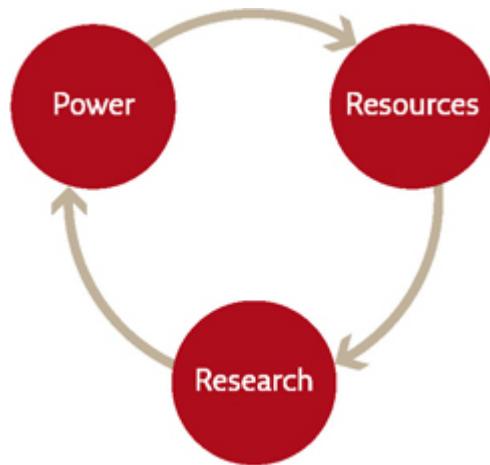
But the single most remarkable and defining moment of the past 500 years came at 05:29:45 on 16 July 1945. At that precise second, American scientists detonated the first atomic bomb at Alamogordo, New Mexico. From that point onward, humankind had the capability not only to change the course of history, but to end it.

The historical process that led to Alamogordo and to the moon is known as the Scientific Revolution. During this revolution humankind has obtained enormous new powers by investing resources in scientific research. It is a revolution because, until about AD 1500, humans the world over doubted their ability to obtain new medical, military and economic powers. While government and wealthy patrons allocated funds to education and scholarship, the aim was, in general, to preserve existing capabilities rather than acquire new ones. The typical premodern ruler gave money to priests, philosophers and poets in the hope that they would legitimise his rule and maintain the social order. He did not expect them to discover new medications, invent new weapons or stimulate economic growth.

過去500年中最令人驚嘆和具有劃時代意義的一刻發生在1945年7月16日的05:29:45。在那個精確的時刻，美國科學家在新墨西哥州的阿拉莫戈多，引爆了第一個原子彈。從那時起，人類不僅有能力改變歷史的進程，而且有能力結束它。過去的這個歷史進程被稱為科學革命，其中人類通過投資科學研究獲得了巨大的新能力。這是一場革命，因為直到公元1500年左右，全世界的人們都懷疑自己獲得新的醫療、軍事和經濟力量的能力。雖然政府和富有的贊助人為教育和學術項目分配資源，但一般來說，目的是為了保持現有的能力，而不是獲得新的能力。典型的前現代統治者給予祭司、哲學家和詩人資金，希望他們能為他的統治合法化，維護社會秩序。他並不期望他們發現新的藥物，發明新的武器或刺激經濟增長。

During the last five centuries, humans increasingly came to believe that they could increase their capabilities by investing in scientific research. This wasn't just blind faith – it was repeatedly proven empirically. The more proofs there were, the more resources wealthy people and governments 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.

在過去五個世紀中，人類逐漸相信通過投資科學研究可以增強自身能力。這不僅僅是盲目的信仰，而是一再被實證證明的。證據越多，富有的人們和政府就會投入更多的資源到科學領域。如果沒有這些投資，我們永遠無法在月球上行走、研發微生物，也無法分裂原子。例如，美國政府近幾十年已經將數十億美元撥款用於核物理學研究。這些研究所產生的知識使核電站的建造成為可能，它為美國工業提供了廉價電力，這些工業繳納稅款給美國政府，美國政府使用其中一部分稅款再投資核物理學研究。



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.

科學革命的反饋迴路。科學進步需要的不僅僅是研究，還需要依賴科學，政治和經濟的互動支持。政治和經濟機構提供資源，如果沒有這些資源，科學研究幾乎是不可能的。反過來，科學研究提供新的能力，用於獲取新資源，其中一些再投資於研究。為什麼現代人類逐漸相信自己通過研究可以獲得新能力？是什麼鍛造了科學，政治和經濟之間的聯繫？本章將探討現代科學的獨特性質，以提供部分答案。接下來的兩章將探究科學，歐洲帝國和資本主義經濟之間的聯盟形成。

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.

b. The centrality of observation and mathematics . Having admitted ignorance, modern science aims to obtain new knowledge. It does so by gathering observations and then using mathematical tools to connect these observations into comprehensive theories.

人们自认知革命以来一直寻求了解宇宙。我们的祖先花费了大量时间和精力来尝试发现统御自然界的规律。但是，现代科学与以往的所有知识传统不同，它有三个关键方面的不同： a. 承认无知。现代科学基于拉丁语的*ignoramus*：“我们不知道”。它假设我们并不知道一切。更为关键的是，它承认我们认为已经知道的东西在我们获得新知识时可能被证明错误。没有任何概念、观念或理论是至高无上且不容置疑的。 b. 观察和数学的重要性。承认无知之后，现代科学旨在获取新知识。它通过收集观察结果，然后使用数学工具将这些观察结果连接成完整的理论。

c. The acquisition of new powers . Modern science is not content with creating theories. It uses these theories in order to acquire new powers, and in particular to develop new technologies.

The Scientific Revolution has not been a revolution of knowledge. It has been above all a revolution of ignorance. The great discovery that launched the Scientific Revolution was the discovery that humans do not know the answers to their most important questions.

Premodern traditions of knowledge such as Islam, Christianity, Buddhism and Confucianism asserted that everything that is important to know about the

world was already known. The great gods, or the one almighty God, or the wise people of the past possessed all-encompassing wisdom, which they revealed to us in scriptures and oral traditions. Ordinary mortals gained knowledge by delving into these ancient texts and traditions and understanding them properly. It was inconceivable that the Bible, the Qur'an or the Vedas were missing out on a crucial secret of the universe – a secret that might yet be discovered by flesh-and-blood creatures.

c. 獲得新力量。現代科學不僅僅是建立理論。它利用這些理論來獲得新力量，特別是發展新技術。科學革命不是一場知識革命，而是一場無知的革命。科學革命的開端是發現人類並不知道他們最重要問題的答案。伊斯蘭教、基督教、佛教和儒家等前現代的知識傳統認為人們對世界的一切重要了解都已經獲得。偉大的神明、萬能的上帝或是古代智者擁有包羅萬象的智慧，他們透過經文和口耳相傳傳達給人類。普通人透過研讀這些古代文本和傳統並正確理解它們得到知識。聖經、古蘭經或吠陀經缺失宇宙的重要秘密是難以想象的 - 這樣的秘密或許能被肉體生物發現。

Ancient traditions of knowledge admitted only two kinds of ignorance. First, an *individual* might be ignorant of something important. To obtain the necessary knowledge, all he needed to do was ask somebody wiser. There was no need to discover something that nobody yet knew. For example, if a peasant in some thirteenth-century Yorkshire village wanted to know how the human race originated, he assumed that Christian tradition held the definitive answer. All he had to do was ask the local priest.

Second, an *entire tradition* might be ignorant of *unimportant* things. By definition, whatever the great gods or the wise people of the past did not bother to tell us was unimportant. For example, if our Yorkshire peasant wanted to know how spiders weave their webs, it was pointless to ask the priest, because there was no answer to this question in any of the Christian Scriptures. That did not mean, however, that Christianity was deficient. Rather, it meant that understanding how spiders weave their webs was unimportant. After all, God knew perfectly well how spiders do it. If this were a vital piece of information, necessary for human prosperity and salvation, God would have included a comprehensive explanation in the Bible.

古代的知識傳統只承認兩種無知。第一種，個體可能無知於一些重要事情，要獲取必要的知識，只需要問一些比自己更明智的人。沒有必要發現還沒有人知道的東西。例如，如果十三世紀某個約克郡村莊的農民想知道人類是如何起源的，他假設基督教傳統持有最終的答案，只要問當地的牧師就可以得到答案。第二種，整個傳統可能無知於無關緊要的事情。按照定義，偉大的神祇或過去的賢人沒有告訴我們的東西都是無關緊要的。例如，如果我們的約克郡農民想知道蜘蛛如何編織它們的網，問牧師是沒有意義的，因為在任何基督教經文中都沒有這個問題的答案。然而，這並不意味著基督教有缺陷。相反，它意味著理解蜘蛛如何編織它們的網是不重要的。畢竟，上帝非常清楚蜘蛛是如何做到的。如果這是必要的信息，對人類的繁榮和救贖是必要的，上帝就會在聖經中包含一個全面的解釋。

Christianity did not forbid people to study spiders. But spider scholars – if there were any in medieval Europe – had to accept their peripheral role in society and the irrelevance of their findings to the eternal truths of Christianity. No matter what a scholar might discover about spiders or butterflies or Galapagos finches, that knowledge was little more than trivia, with no bearing on the fundamental truths of society, politics and economics.

In fact, things were never quite that simple. In every age, even the most pious and conservative, there were people who argued that there were *important* things of which their *entire tradition* was ignorant. Yet such people were usually marginalised or persecuted – or else they founded a new tradition and began arguing that *they* knew everything there is to know. For example, the prophet Muhammad began his religious career by condemning his fellow Arabs for living in ignorance of the divine truth. Yet Muhammad himself very quickly began to argue that *he* knew the full truth, and his followers began calling him ‘The Seal of the Prophets’. Henceforth, there was no need of revelations beyond those given to Muhammad.

基督教並未禁止人們研究蜘蛛。然而，如果中世紀的歐洲有蜘蛛學者，他們必須接受自己在社會中的邊緣地位和他們的發現對基督教的永恆真理的無關聯性。無論學者發現了什麼有關蜘蛛、蝴蝶或加拉帕戈斯雀的知識，那都只是些微不足道的膚淺知識，對社會、政治和經濟的基本真理沒有任何關聯。事實上，事情從來不是那麼簡單。在每個時代，即使是最虔誠和保守的人，都會有人主張有重要的事情是他

們整個傳統不知道的。然而，這樣的人通常被邊緣化或迫害，否則他們就創立了一個新的傳統，開始主張他們知道所有的一切。例如，先知穆罕默德開始他的宗教生涯，譴責他的同胞阿拉伯人對神的真理一無所知。但很快，穆罕默德自己就開始主張自己知道全部真理，他的追隨者開始稱他為“先知的印章”。從那時起，穆罕默德以外的啟示是不需要的。

Modern-day science is a unique tradition of knowledge, inasmuch as it openly admits *collective ignorance* regarding *the most important questions*. Darwin never argued that he was ‘The Seal of the Biologists’, and that he had solved the riddle of life once and for all. After centuries of extensive scientific research, biologists admit that they still don’t have any good explanation for how brains produce consciousness. Physicists admit that they don’t know what caused the Big Bang, or how to reconcile quantum mechanics with the theory of general relativity.

In other cases, competing scientific theories are vociferously debated on the basis of constantly emerging new evidence. A prime example is the debates about how best to run the economy. Though individual economists may claim that their method is the best, orthodoxy changes with every financial crisis and stock-exchange bubble, and it is generally accepted that the final word on economics is yet to be said.

現代科學是一種獨特的知識傳統，因為它公開承認對最重要的問題存在集體無知。達爾文從未宣稱自己是“生物學家的印章”，也從未解決了有關生命之謎的問題。經過數百年的廣泛科學研究之後，生物學家承認他們仍然沒有對大腦如何產生意識有任何良好的解釋。物理學家承認他們不知道是什麼引起了大爆炸，或如何將量子力學與廣義相對論相結合。在其他情況下，基於不斷出現的新證據，科學家們競相辯論競爭性的科學理論。一個典型的例子是關於如何最好地運行經濟的辯論。儘管個別經濟學家可能聲稱他們的方法是最好的，但正統派經濟學隨著每次金融危機和股市泡沫的出現而改變，普遍認為經濟學的最終判斷尚未到來。

In still other cases, particular theories are supported so consistently by the available evidence, that all alternatives have long since fallen by the wayside. Such theories are accepted as true – yet everyone agrees that were

new evidence to emerge that contradicts the theory, it would have to be revised or discarded. Good examples of these are the plate tectonics theory and the theory of evolution.

The willingness to admit ignorance has made modern science more dynamic, supple and inquisitive than any previous tradition of knowledge. This has hugely expanded our capacity to understand how the world works and our ability to invent new technologies. But it presents us with a serious problem that most of our ancestors did not have to cope with. Our current assumption that we do not know everything, and that even the knowledge we possess is tentative, extends to the shared myths that enable millions of strangers to cooperate effectively. If the evidence shows that many of those myths are doubtful, how can we hold society together? How can our communities, countries and international system function?

在其他一些情況下，某些理論的證據在可用證據中得到如此一致的支持，以至於所有替代方案早已被淘汰。這些理論被接受為真實 - 然而，每個人都同意，如果新的證據出現與理論相矛盾，那麼它就必須被修訂或丟棄。這些的好例子是板塊構造理論和進化論。坦承自己的無知已使現代科學比以往任何知識傳統更具動態性，更能適應、更好奇。這大大擴展了我們理解世界運作方式及發明新技術的能力。但它也讓我們面臨了一個嚴重的問題，這是我們的祖先大多不必應對的。我們目前的假設是我們不知道一切，而我們擁有的甚至是暫時的知識，包括讓數百萬陌生人有效合作的共同神話。如果證據顯示許多這些神話是值得懷疑的，我們該如何維持社會團結？我們的社區、國家和國際體系該如何運作？

All modern attempts to stabilise the sociopolitical order have had no choice but to rely on either of two unscientific methods:

a . Take a scientific theory, and in opposition to common scientific practices, *declare that it is a final and absolute truth* . This was the method used by Nazis (who claimed that their racial policies were the corollaries of biological facts) and Communists (who claimed that Marx and Lenin had divined absolute economic truths that could never be refuted).

b . Leave science out of it and live in accordance with *a non-scientific absolute truth* . This has been the strategy of liberal humanism, which is built on a dogmatic belief in the unique worth and rights of human beings – a doctrine which has embarrassingly little in common with the scientific study of *Homo sapiens* .

所有現代穩定社會政治秩序嘗試都不得不依賴其中兩個不科學的方法之一： a. 採用科學理論，並反對一般科學實踐，宣稱它是最終和絕對的真理。這是納粹使用的方法（他們聲稱其種族政策是生物事實的推論）和共產主義者使用的方法（他們聲稱馬克思和列寧已經預見了永遠無法被反駁的絕對經濟真理）。 b. 離開科學，並根據非科學的絕對真理生活。這是自由人道主義的策略，它建立在對人類獨特價值和權利的教條信仰之上-這種教義在對智人的科學研究中非常少見，而且非常令人尷尬。

But that shouldn't surprise us. Even science itself has to rely on religious and ideological beliefs to justify and finance its research.

Modern culture has nevertheless been willing to embrace *ignorance* to a much greater degree than has any previous culture. One of the things that has made it possible for modern social orders to hold together is the spread of an almost religious belief in technology and in the methods of scientific research, which have replaced to some extent the belief in absolute truths.

The Scientific Dogma

Modern science has no dogma. Yet it has a common core of research methods, which are all based on collecting empirical observations – those we can observe with at least one of our senses – and putting them together with the help of mathematical tools.

People throughout history collected empirical observations, but the importance of these observations was usually limited. Why waste precious resources obtaining new observations when we already have all the answers we need? But as modern people came to admit that they did not know the answers to some very important questions, they found it necessary to look for *completely new knowledge*. Consequently, the dominant modern research

method takes for granted the insufficiency of old knowledge. Instead of studying old traditions, emphasis is now placed on new observations and experiments. When present observation collides with past tradition, we give precedence to the observation. Of course, physicists analysing the spectra of distant galaxies, archaeologists analysing the finds from a Bronze Age city, and political scientists studying the emergence of capitalism do not disregard tradition. They start by studying what the wise people of the past have said and written. But from their first year in college, aspiring physicists, archaeologists and political scientists are taught that it is their mission to go beyond what Einstein, Heinrich Schliemann and Max Weber ever knew.

但這不應該讓我們感到驚訝。即使科學本身也必須依賴宗教和意識形態信仰來證明和資助其研究。現代文化相對於任何以前的文化都更願意擁抱無知。現代社會為維持穩定所推崇的影響因素之一，就是對科技和科學研究方法的一種近乎宗教般的信仰，這種信仰在一定程度上取代了對絕對真理的信仰。現代科學沒有任何教條。然而，它有一個共同的核心研究方法，這些方法都是基於收集經驗觀察 - 我們可以用至少一個感官觀察到的東西 - 並通過數學工具予以整合。歷史上的人們收集經驗觀察，但這些觀察的重要性通常是有限的。為什麼要浪費寶貴的資源去獲取新的觀察結果，當我們已經擁有所有我們需要的答案呢？但是，隨著現代人承認他們對一些非常重要的問題不知道答案，他們發現有必要尋找全新的知識。因此，佔主導地位的現代研究方法基於對舊知識的不足之處進行探索。現在，強調新觀察和實驗，而非研究舊傳統。當當前觀察與過去傳統發生衝突時，我們傾向於優先考慮觀察結果。當然，分析遠距離星系光譜的物理學家、分析青銅時代城市發現物的考古學家和研究資本主義崛起的政治學家並不會忽視傳統。他們開始研究先人的智慧和文件。但是，從大學一年級開始，有抱負的物理學家、考古學家和政治學家就被教導，他們的使命是超越愛因斯坦，海因里希·施利曼和韋伯所知道的一切。

Mere observations, however, are not knowledge. In order to understand the universe, we need to connect observations into comprehensive theories. Earlier traditions usually formulated their theories in terms of stories. Modern science uses mathematics.

There are very few equations, graphs and calculations in the Bible, the Qur'an, the Vedas or the Confucian classics. When traditional mythologies

and scriptures laid down general laws, these were presented in narrative rather than mathematical form. Thus a fundamental principle of Manichaean religion asserted that the world is a battleground between good and evil. An evil force created matter, while a good force created spirit. Humans are caught between these two forces, and should choose good over evil. Yet the prophet Mani made no attempt to offer a mathematical formula that could be used to predict human choices by quantifying the respective strength of these two forces. He never calculated that ‘the force acting on a man is equal to the acceleration of his spirit divided by the mass of his body’.

觀察本身並不等同於知識。為了了解宇宙，我們需要將觀察連結成完整的理論。傳統的觀念通常通過故事來表達其理論，而現代科學則使用數學。聖經、古蘭經、吠陀經或論語中幾乎沒有方程式、圖形和計算。當傳統神話和經文設立一般法則時，這些法則通常是通過敘述而不是數學形式來呈現的。因此，摩尼教的一個基本原則宣稱世界是善惡之間的戰場。邪惡的力量創造了物質，而善良的力量創造了靈魂。人類被困在這兩種力量之間，應該選擇善良而不是邪惡。但是，先知摩尼從未嘗試提供一個可以通過量化這兩種力量的相對強度來預測人類選擇的數學公式。他從來沒有計算出“作用於人的力等於他的靈魂加速度除以身體質量”。

This is exactly what scientists seek to accomplish. In 1687, Isaac Newton published *The Mathematical Principles of Natural Philosophy*, arguably the most important book in modern history. Newton presented a general theory of movement and change. The greatness of Newton’s theory was its ability to explain and predict the movements of all bodies in the universe, from falling apples to shooting stars, using three very simple mathematical laws:

$$1. \sum \vec{F} = 0$$

$$2. \sum \vec{F} = m\vec{a}$$

$$3. \vec{F}_{1,2} = -\vec{F}_{2,1}$$

Henceforth, anyone who wished to understand and predict the movement of a cannonball or a planet simply had to make measurements of the object's mass, direction and acceleration, and the forces acting on it. By inserting these numbers into Newton's equations, the future position of the object could be predicted. It worked like magic. Only around the end of the nineteenth century did scientists come across a few observations that did not fit well with Newton's laws, and these led to the next revolutions in physics – the theory of relativity and quantum mechanics.

這正是科學家所追求的。1687年，艾薩克·牛頓出版了《自然哲學的數學原理》，這可能是現代史上最重要的書籍。牛頓提出了運動和變化的一般理論。牛頓理論的偉大之處在於它能夠使用三個非常簡單的數學法則來解釋和預測宇宙中所有物體的運動，從落下的蘋果到流星。因此，任何希望了解和預測炮彈或行星運動的人只需測量物體的質量、方向和加速度以及作用於物體上的力量。通過將這些數字插入牛頓的方程式中，可以預測物體的未來位置。它像魔法一樣發揮作用。直到19世紀末，科學家才遇到了一些觀察結果，這些結果與牛頓的法則不太吻合，這導致了物理學的下一個革命-相對論和量子力學。

Newton showed that the book of nature is written in the language of mathematics. Some chapters (for example) boil down to a clear-cut equation; but scholars who attempted to reduce biology, economics and psychology to neat Newtonian equations have discovered that these fields have a level of complexity that makes such an aspiration futile. This did not mean, however, that they gave up on mathematics. A new branch of mathematics was developed over the last 200 years to deal with the more complex aspects of reality: statistics.

In 1744, two Presbyterian clergymen in Scotland, Alexander Webster and Robert Wallace, decided to set up a life-insurance fund that would provide pensions for the widows and orphans of dead clergymen. They proposed that each of their church's ministers would pay a small portion of his income into the fund, which would invest the money. If a minister died, his widow would receive dividends on the fund's profits. This would allow her to live comfortably for the rest of her life. But to determine how much the ministers had to pay in so that the fund would have enough money to live up to its obligations, Webster and Wallace had to be able to predict how many

ministers would die each year, how many widows and orphans they would leave behind, and by how many years the widows would outlive their husbands.

牛頓表明自然的書寫是用數學語言撰寫的。一些章節（例如）歸納為明確的方程；但試圖將生物學、經濟學和心理學歸納為整齊的牛頓方程式的學者們發現，這些領域具有無法實現這種渴望的復雜程度。然而，這並不意味著他們放棄了數學。過去200年開發出了一個新的數學分支，以應對現實更復雜的方面：統計學 1744年，蘇格蘭的兩位長老會牧師亞歷山大·韋伯斯特和羅伯特·華萊士決定成立一個壽險基金，為死亡的牧師的寡婦和孤兒提供退休金。他們建議教堂的每位牧師都要支付他的一小部分收入到這個基金中，這個基金會進行投資。如果一位牧師去世，他的寡婦將會收到基金收益的紅利。這將允許她在餘生中過上舒適的生活。但是，為了確定牧師們需要支付多少錢，以便該基金有足夠的錢來達到其義務，韋伯斯特和華萊士必須能夠預測每年會有多少牧師死亡，他們將會留下多少寡婦和孤兒，以及寡婦會比他們的丈夫多活多少年。

Take note of what the two churchmen did not do. They did not pray to God to reveal the answer. Nor did they search for an answer in the Holy Scriptures or among the works of ancient theologians. Nor did they enter into an abstract philosophical disputation. Being Scots, they were practical types. So they contacted a professor of mathematics from the University of Edinburgh, Colin Maclaurin. The three of them collected data on the ages at which people died and used these to calculate how many ministers were likely to pass away in any given year.

Their work was founded on several recent breakthroughs in the fields of statistics and probability. One of these was Jacob Bernoulli's Law of Large Numbers. Bernoulli had codified the principle that while it might be difficult to predict with certainty a single event, such as the death of a particular person, it was possible to predict with great accuracy the average outcome of many similar events. That is, while Maclaurin could not use maths to predict whether Webster and Wallace would die next year, he could, given enough data, tell Webster and Wallace how many Presbyterian ministers in Scotland would almost certainly die next year. Fortunately, they had ready-made data that they could use. Actuary tables published fifty years previously by

Edmond Halley proved particularly useful. Halley had analysed records of 1,238 births and 1,174 deaths that he obtained from the city of Breslau, Germany. Halley's tables made it possible to see that, for example, a twenty-year-old person has a 1:100 chance of dying in a given year, but a fifty-year-old person has a 1:39 chance.

請注意兩位教士所沒有做的事情。他們沒有向上帝祈求揭示答案，也沒有在聖經或古代神學家的著作中尋找答案。他們也沒有進入抽象的哲學爭論。作為蘇格蘭人，他們是實際的人。因此，他們聯繫了愛丁堡大學的數學教授科林·麥克勞林。他們三人收集了人們死亡時的年齡數據，並用這些數據計算出任何一年可能會有多少牧師去世。他們的工作建立在統計學和概率學領域的幾項最近突破性成果上。其中之一是雅各布·伯努利的大數定理。伯努利總結出一個原則，即雖然可能很難確定單一事件（例如某個人的死亡事件）的預測，但是可以以很高的準確性預測許多類似事件的平均結果。換言之，麥克勞林不能用數學來預測韋伯斯特和華萊士明年是否會死亡，但是，如果有足夠的數據，他可以告訴他們明年蘇格蘭長老會有多少牧師幾乎肯定會死亡。幸運的是，他們有現成的數據可以使用。埃德蒙·哈雷五十年前發表的保險精算表尤其有用。哈雷分析了他從德國不萊梅市獲得的1238例出生和1174例死亡記錄。哈雷的表格讓人們能夠看到，例如二十歲的人在一年內死亡的機率是1: 100，但五十歲的人在一年內死亡的機率是1: 39。

Processing these numbers, Webster and Wallace concluded that, on average, there would be 930 living Scottish Presbyterian ministers at any given moment, and an average of twenty-seven ministers would die each year, eighteen of whom would be survived by widows. Five of those who did not leave widows would leave orphaned children, and two of those survived by widows would also be outlived by children from previous marriages who had not yet reached the age of sixteen. They further computed how much time was likely to go by before the widows' death or remarriage (in both these eventualities, payment of the pension would cease). These figures enabled Webster and Wallace to determine how much money the ministers who joined their fund had to pay in order to provide for their loved ones. By contributing £2 12 s . 2 d . a year, a minister could guarantee that his widowed wife would receive at least £10 a year – a hefty sum in those days. If he thought that was not enough he could choose to pay in more, up to a level of £6 11 s .

3 d . a year – which would guarantee his widow the even more handsome sum of £25 a year.

韋伯斯特和華萊士對這些數字進行處理後，得出平均每時刻會有930名蘇格蘭長老會牧師在世，每年平均有27名牧師去世，其中18人的遺孀會持續生活。其中5人沒有留下寡婦，但有孤兒，而其中有2人的遺孀也會被前婚姻的未滿16歲的孩子活過去。他們進一步計算了遺孀可能去世或再婚前的時間（在這兩種情況下，撥付養老金將停止）。這些數字使韋伯斯特和華萊士能夠確定那些加入他們基金的牧師需要支付多少錢以供養他們的家人。每年捐贈2英鎊12先令2便士，一位牧師就可以保證他的寡婦每年至少會收到10英鎊的生活費 - 在當時來說是一筆不小的金額。如果他認為這不夠，他可以選擇支付更多，最高可支付6英鎊11先令3便士，這樣可以保證他的遺孀每年會獲得更豐厚的25英鎊。

According to their calculations, by the year 1765 the Fund for a Provision for the Widows and Children of the Ministers of the Church of Scotland would have capital totalling £58,348. Their calculations proved amazingly accurate. When that year arrived, the fund's capital stood at £58,347 – just £1 less than the prediction! This was even better than the prophecies of Habakkuk, Jeremiah or St John. Today, Webster and Wallace's fund, known simply as Scottish Widows, is one of the largest pension and insurance companies in the world. With assets worth £100 billion, it insures not only Scottish widows, but anyone willing to buy its policies. [7](#)

Probability calculations such as those used by the two Scottish ministers became the foundation not merely of actuarial science, which is central to the pension and insurance business, but also of the science of demography (founded by another clergyman, the Anglican Robert Malthus). Demography in its turn was the cornerstone on which Charles Darwin (who almost became an Anglican pastor) built his theory of evolution. While there are no equations that predict what kind of organism will evolve under a specific set of conditions, geneticists use probability calculations to compute the likelihood that a particular mutation will spread in a given population. Similar probabilistic models have become central to economics, sociology, psychology, political science and the other social and natural sciences. Even

physics eventually supplemented Newton's classical equations with the probability clouds of quantum mechanics.

據其計算，到1765年，蘇格蘭教會牧師寡婦和孤兒資助基金的資金總額將達到58,348英鎊。他們的計算驚人地準確了。當那一年來臨時，該基金的資本總額為58,347英鎊，僅比預測少了1英鎊！這甚至比哈巴谷書、耶利米書或聖約翰的預言更好。今天，韋伯斯特和華萊士的基金，即蘇格蘭寡婦，是世界上最大的退休金和保險公司之一。擁有價值1000億英鎊的資產，它不僅保險給蘇格蘭的寡婦，還保險給願意購買其保單的任何人。類似那兩位蘇格蘭牧師使用的概率計算，不僅成為了退休金和保險業務的中心——精算科學的基礎，而且還成為了人口統計科學（由另一位牧師英國國教牧師羅伯特·馬爾薩斯創立）的基礎。而人口統計學則成為了查爾斯·達爾文（他幾乎成為一名英國國教牧師）建立進化論的基石。儘管沒有方程式可以預測在特定條件下將會出現什麼樣的生物體，但遺傳學家使用概率計算來計算特定突變在給定人群中擴散的可能性。類似的概率模型已成為經濟學、社會學、心理學、政治科學和其他社會和自然科學的核心。即使物理學也最終補充了牛頓的經典方程式，加上了量子力學的概率雲。

We need merely look at the history of education to realise how far this process has taken us. Throughout most of history, mathematics was an esoteric field that even educated people rarely studied seriously. In medieval Europe, logic, grammar and rhetoric formed the educational core, while the teaching of mathematics seldom went beyond simple arithmetic and geometry. Nobody studied statistics. The undisputed monarch of all sciences was theology.

Today few students study rhetoric; logic is restricted to philosophy departments, and theology to seminaries. But more and more students are motivated – or forced – to study mathematics. There is an irresistible drift towards the exact sciences – defined as ‘exact’ by their use of mathematical tools. Even fields of study that were traditionally part of the humanities, such as the study of human language (linguistics) and the human psyche (psychology), rely increasingly on mathematics and seek to present themselves as exact sciences. Statistics courses are now part of the basic requirements not just in physics and biology, but also in psychology, sociology, economics and political science.

看教育的歷史就能發現這個過程到了何種程度。在大多數歷史時期，數學是一個異教徒的領域，即使是有學識的人也很少認真學習。在中世紀的歐洲，邏輯、文法和修辭形成了教育核心，而數學的教學很少超越簡單的算術和幾何學。沒有人學習統計學。所有科學中無可爭議的君主就是神學。今天，幾乎沒有學生學習修辭學，邏輯被限制在哲學系，神學被限制在修院。但越來越多的學生被動或主動地學習數學。不可抗拒地朝著精確科學的方向漂移，其定義是通過數學工具來實現。即使是傳統上屬於人文學科的研究，如人類語言學和人類心理學，也越來越依賴數學並試圖呈現自己為精確科學。統計學課程現在不僅是物理學和生物學的基本要求，也是心理學、社會學、經濟學和政治學的基本要求。

In the course catalogue of the psychology department at my own university, the first required course in the curriculum is 'Introduction to Statistics and Methodology in Psychological Research'. Second-year psychology students must take 'Statistical Methods in Psychological Research'. Confucius, Buddha, Jesus and Muhammad would have been bewildered if you told them that in order to understand the human mind and cure its illnesses you must first study statistics.

Knowledge is Power

Most people have a hard time digesting modern science because its mathematical language is difficult for our minds to grasp, and its findings often contradict common sense. Out of the 7 billion people in the world, how many really understand quantum mechanics, cell biology or macroeconomics? Science nevertheless enjoys immense prestige because of the new powers it gives us. Presidents and generals may not understand nuclear physics, but they have a good grasp of what nuclear bombs can do.

在我自己的大學心理學系課程目錄中，課程首先要求修讀「心理學研究中的統計與方法學入門」。大二心理學生則需修讀「心理學研究的統計方法」。孔子、佛陀、耶穌和穆罕默德若聽到你說想要理解人類思想並治癒其疾病必須先學習統計學，他們會感到困惑不解。大多數人很難理解現代科學，因為其數學語言對我們的腦海極其抽象，其研究發現經常與常識相悖。在全世界的70億人中，有多少人真正了解量

子力學、細胞生物學或宏觀經濟學？然而，科學擁有巨大的威望，因為它賦予了我們新的力量。總統和將軍可能不了解核物理學，但他們對核彈能做些什麼有很好的掌握。

In 1620 Francis Bacon published a scientific manifesto titled *The New Instrument*. In it he argued that ‘knowledge is power’. The real test of ‘knowledge’ is not whether it is true, but whether it empowers us. Scientists usually assume that no theory is 100 per cent correct. Consequently, truth is a poor test for knowledge. The real test is utility. A theory that enables us to do new things constitutes knowledge.

Over the centuries, science has offered us many new tools. Some are mental tools, such as those used to predict death rates and economic growth. Even more important are technological tools. The connection forged between science and technology is so strong that today people tend to confuse the two. We often think that it is impossible to develop new technologies without scientific research, and that there is little point in research if it does not result in new technologies.

在1620年，弗朗西斯·培根發表了一份名為《新工具》的科學宣言。他在其中論述：「知識就是力量」。真正測試「知識」的方式並非它是否正確，而是能否讓人們更有權能。科學家經常假設沒有哪一個理論是100%正確。因此，真理是一個較差的知識測試方法。真正的測試方式是實用性。一個能讓我們做到新事物的理論，就代表這是一種知識。多個世紀以來，科學帶給我們許多新工具。有些是精神工具，例如用來預測死亡率和經濟增長等的工具。更重要的是技術工具。科技與科學之間的聯繫非常密切，以至於今天人們往往混淆這兩者。我們經常認為如果沒有科學研究，就不可能發展新技術，而且如果研究不導致新技術的出現，那麼研究也沒有太大的意義。

In fact, the relationship between science and technology is a very recent phenomenon. Prior to 1500, science and technology were totally separate fields. When Bacon connected the two in the early seventeenth century, it was a revolutionary idea. During the seventeenth and eighteenth centuries this relationship tightened, but the knot was tied only in the nineteenth century. Even in 1800, most rulers who wanted a strong army, and most business

magnates who wanted a successful business, did not bother to finance research in physics, biology or economics.

I don't mean to claim that there is no exception to this rule. A good historian can find precedent for everything. But an even better historian knows when these precedents are but curiosities that cloud the big picture. Generally speaking, most premodern rulers and business people did not finance research about the nature of the universe in order to develop new technologies, and most thinkers did not try to translate their findings into technological gadgets. Rulers financed educational institutions whose mandate was to spread traditional knowledge for the purpose of buttressing the existing order.

事實上，科學與技術之間的關係是一個非常近代的現象。在 1500 年之前，科學和技術是完全獨立的領域。當培根在十七世紀初將這兩者聯繫起來時，這是一個革命性的想法。在十七和十八世紀，這種關係變得更加緊密，但結合的扣子直到十九世紀才被打結。即使在 1800 年，大多數想要擁有強大軍隊的統治者和想要成功企業的商業巨頭，也不會煩惱要資助物理、生物或經濟學上的研究。我的意思不是要宣稱這個規則沒有例外。好的歷史學家可以找到每一件事的先例。但更好的歷史學家知道這些前例僅是混淆事情的稀奇古怪之物。一般而言，大多數現代前統治者和商人並沒有資助關於宇宙本質的研究，以發展新技術，而大多數思想家也沒有試圖將他們的發現轉化為技術設備。統治者資助教育機構的使命是傳播傳統知識，以支撐現有秩序。

Here and there people did develop new technologies, but these were usually created by uneducated craftsmen using trial and error, not by scholars pursuing systematic scientific research. Cart manufacturers built the same carts from the same materials year in year out. They did not set aside a percentage of their annual profits in order to research and develop new cart models. Cart design occasionally improved, but it was usually thanks to the ingenuity of some local carpenter who never set foot in a university and did not even know how to read.

This was true of the public as well as the private sector. Whereas modern states call in their scientists to provide solutions in almost every area of national policy, from energy to health to waste disposal, ancient kingdoms

seldom did so. The contrast between then and now is most pronounced in weaponry. When outgoing President Dwight Eisenhower warned in 1961 of the growing power of the military-industrial complex, he left out a part of the equation. He should have alerted his country to the military-industrial-scientific complex, because today's wars are scientific productions. The world's military forces initiate, fund and steer a large part of humanity's scientific research and technological development.

人們偶爾會開發新技術，但這通常是由未受教育的工匠通過試錯法創造的，而不是由追求系統性科學研究的學者創造的。馬車製造商年復一年地用相同的材料建造同樣的馬車。他們沒有留出年度利潤的一定比例來研究和開發新的馬車模型。馬車設計偶爾有所改進，但通常是由於當地一些木匠的獨創性，他們從未踏入過大學，甚至不知道如何閱讀。這對公共和私營部門都是真實的。現代國家在幾乎每一個國家政策領域都要請來科學家提供解決方案，從能源到健康到廢物處置。然而，古代王國很少這樣做。當現在的戰爭成為科學製品時，這種對比在武器方面最為明顯。當時任美國總統艾森豪威爾在1961年警告不斷增長的軍事-工業聯合體時，他省略了公式的一部分。他應該讓國家警惕軍事-工業-科學聯合體，因為如今的戰爭是科學的產物。世界各地的軍隊發起、資助和指導著人類大部分的科學研究和技術發展。

When World War One bogged down into interminable trench warfare, both sides called in the scientists to break the deadlock and save the nation. The men in white answered the call, and out of the laboratories rolled a constant stream of new wonder-weapons: combat aircraft, poison gas, tanks, submarines and ever more efficient machine guns, artillery pieces, rifles and bombs.



33. German V-2 rocket ready to launch. It didn't defeat the Allies, but it kept the Germans hoping for a technological miracle until the very last days of the war .

Science played an even larger role in World War Two. By late 1944 Germany was losing the war and defeat was imminent. A year earlier, the Germans' allies, the Italians, had toppled Mussolini and surrendered to the Allies. But Germany kept fighting on, even though the British, American and Soviet armies were closing in. One reason German soldiers and civilians thought not all was lost was that they believed German scientists were about to turn the tide with so-called miracle weapons such as the V-2 rocket and jet-powered aircraft.

第一次世界大戰陷入了漫長的戰壕戰，雙方都召集了科學家來打破僵局並拯救國家。白衣人回應了呼喚，實驗室裡不斷滾動出新奇武器：戰鬥飛機、毒氣、坦克、潛艇和越來越高效的機槍、火炮、步槍和炸彈。33.德國V-2火箭準備發射。它沒有擊敗同盟國，但它讓德國人在戰爭的最後幾天仍然抱著科技奇蹟的希望。科學在第二次世界大戰中扮演了更大的角色。到1944年末，德國正在輸掉戰爭，失敗即將來臨。一年前，德國的盟友意大利推翻了墨索里尼並向同盟國投降。但德國仍在繼續戰鬥，即使英美和蘇聯軍隊正在逼近。一個原因是，德

國士兵和平民認為，他們的科學家即將通過所謂的奇蹟武器（例如V-2火箭和噴氣動力飛機）扭轉局勢。

While the Germans were working on rockets and jets, the American Manhattan Project successfully developed atomic bombs. By the time the bomb was ready, in early August 1945, Germany had already surrendered, but Japan was fighting on. American forces were poised to invade its home islands. The Japanese vowed to resist the invasion and fight to the death, and there was every reason to believe that it was no idle threat. American generals told President Harry S. Truman that an invasion of Japan would cost the lives of a million American soldiers and would extend the war well into 1946. Truman decided to use the new bomb. Two weeks and two atom bombs later, Japan surrendered unconditionally and the war was over.

But science is not just about offensive weapons. It plays a major role in our defences as well. Today many Americans believe that the solution to terrorism is technological rather than political. Just give millions more to the nanotechnology industry, they believe, and the United States could send bionic spy-flies into every Afghan cave, Yemenite redoubt and North African encampment. Once that's done, Osama Bin Laden's heirs will not be able to make a cup of coffee without a CIA spy-fly passing this vital information back to headquarters in Langley. Allocate millions more to brain research, and every airport could be equipped with ultra-sophisticated FMRI scanners that could immediately recognise angry and hateful thoughts in people's brains. Will it really work? Who knows. Is it wise to develop bionic flies and thought-reading scanners? Not necessarily. Be that as it may, as you read these lines, the US Department of Defense is transferring millions of dollars to nanotechnology and brain laboratories for work on these and other such ideas.

當德國致力於火箭和噴氣機的研發時，美國曼哈頓計劃成功開發出原子彈。到了1945年8月初，當這個炸彈準備好了時，德國已經投降了，但日本仍在繼續戰鬥。美國軍隊已在準備入侵其本土。日本人發誓會抵抗入侵並且誓死奮鬥，而且有足夠的理由相信這並非空口說白話。美國將領告訴總統哈利·S·杜魯門，入侵日本將會造成一百萬美國士兵喪生，而且戰爭會一直延續到1946年。杜魯門決定使用新炸彈。兩週後，投下兩枚原子彈後，日本無條件投降，戰爭結束了。但科學不僅

僅是關於進攻武器。它在我們的防禦中也扮演重要角色。如今，許多美國人相信，解決恐怖主義的辦法是技術而非政治。他們相信只要再給納米技術行業數百萬美元，美國就能派出仿生間諜蒼蠅進入阿富汗的每個山洞、也門的每個據點和北非的每個營地。一旦做到了這一點，奧薩瑪·賓·拉登的繼承人就無法沖煮一杯咖啡，而不被中央情報局派出的間諜蒼蠅將這個重要信息傳回蘭利總部。再分配數百萬美元進行大腦研究，每個機場都可以配備超尖端的FMRI掃描儀，可以立即辨識人腦中的憤怒和仇恨思想。這是否真的有效呢？誰知道呢。開發仿生蒼蠅和思想感應掃描器是否明智呢？未必。儘管如此，當你閱讀這些文字時，美國國防部正在將數百萬美元轉移到納米技術和神經科學實驗室，用於這些和其他類似的想法的研究中。

This obsession with military technology – from tanks to atom bombs to spyflies – is a surprisingly recent phenomenon. Up until the nineteenth century, the vast majority of military revolutions were the product of organisational rather than technological changes. When alien civilisations met for the first time, technological gaps sometimes played an important role. But even in such cases, few thought of deliberately creating or enlarging such gaps. Most empires did not rise thanks to technological wizardry, and their rulers did not give much thought to technological improvement. The Arabs did not defeat the Sassanid Empire thanks to superior bows or swords, the Seljuks had no technological advantage over the Byzantines, and the Mongols did not conquer China with the help of some ingenious new weapon. In fact, in all these cases the vanquished enjoyed superior military and civilian technology.

從坦克到原子弹到間諜蒼蠅這樣的軍事科技狂熱是一個出乎意料的近代現象。直到19世紀，大多數軍事革命都是組織性變化的產物。當外星文明第一次相遇時，技術差距有時扮演了重要角色。但即使在這些情況下，很少有人想到故意創造或擴大這樣的差距。大多數帝國並非依靠技術魔法崛起，其統治者並沒有多想技術的提高。阿拉伯人不是因為弓箭或劍的優勢擊敗了薩珊帝國，塞爾柱人與拜占庭人沒有技術優勢，蒙古人也沒有借助某些新穎的武器征服了中國。事實上，在所有這些情況下，被征服者都擁有優越的軍事和民用技術。

The Roman army is a particularly good example. It was the best army of its day, yet technologically speaking, Rome had no edge over Carthage, Macedonia or the Seleucid Empire. Its advantage rested on efficient

organisation, iron discipline and huge manpower reserves. The Roman army never set up a research and development department, and its weapons remained more or less the same for centuries on end. If the legions of Scipio Aemilianus – the general who levelled Carthage and defeated the Numantians in the second century BC – had suddenly popped up 500 years later in the age of Constantine the Great, Scipio would have had a fair chance of beating Constantine. Now imagine what would happen to a general from a few centuries back – say Napoleon – if he led his troops against a modern armoured brigade. Napoleon was a brilliant tactician, and his men were crack professionals, but their skills would be useless in the face of modern weaponry.

羅馬軍隊是一個特別好的例子。它是當時最好的軍隊，然而就技術而言，羅馬在卡塞爾、馬其頓或塞琉古帝國方面並沒有什麼優勢。它的優勢在於高效的組織、鐵的紀律和巨大的人力儲備。羅馬軍隊從未設置過研發部門，它的武器在數個世紀內基本上保持不變。如果斯基皮奧·埃米利亞努斯（在公元前二世紀征服卡塞爾和擊敗努曼提亞人的將軍）的軍隊突然出現在君士坦丁大帝時代的500年後，他有很大的機會擊敗君士坦丁。現在想象一下，如果幾個世紀前的拿破崙將軍領著他的軍隊對抗現代裝甲旅會怎樣，他們的技能在現代武器面前毫無用處，儘管拿破崙是一個卓越的戰術家，他的士兵也是經驗豐富的專業人士。

As in Rome, so also in ancient China: most generals and philosophers did not think it their duty to develop new weapons. The most important military invention in the history of China was gunpowder. Yet to the best of our knowledge, gunpowder was invented accidentally, by Daoist alchemists searching for the elixir of life. Gunpowder's subsequent career is even more telling. One might have thought that the Daoist alchemists would have made China master of the world. In fact, the Chinese used the new compound mainly for firecrackers. Even as the Song Empire collapsed in the face of a Mongol invasion, no emperor set up a medieval Manhattan Project to save the empire by inventing a doomsday weapon. Only in the fifteenth century – about 600 years after the invention of gunpowder – did cannons become a decisive factor on Afro-Asian battlefields. Why did it take so long for the deadly potential of this substance to be put to military use? Because it

appeared at a time when neither kings, scholars, nor merchants thought that new military technology could save them or make them rich.

就像在羅馬一樣，在古代中國，大多數將領和哲學家並不認為開發新武器是他們的職責。中國歷史上最重要的軍事發明就是火藥。然而據我們所知，火藥是由尋找長生不老藥的道士煉金師意外發明的。火藥的後續發展更能說明問題。人們本以為道士煉金師將使中國成為世界的主宰。事實上，中國人主要用這種新物質製造鞭炮。即使在宋朝面臨蒙古入侵而崩潰的時候，也沒有一個皇帝成立類似中世紀曼哈頓計劃的組織，通過發明一種末日武器來拯救帝國。直到十五世紀，也就是火藥發明後大約600年，大炮才成為非洲和亞洲戰場上決定性的因素。為什麼這種物質的致命潛力要花那麼長的時間才能被用於軍事上？因為當它出現時，無論是國王、學者還是商人都沒有認為新的軍事技術能夠拯救他們或使他們致富。

The situation began to change in the fifteenth and sixteenth centuries, but another 200 years went by before most rulers evinced any interest in financing the research and development of new weapons. Logistics and strategy continued to have far greater impact on the outcome of wars than technology. The Napoleonic military machine that crushed the armies of the European powers at Austerlitz (1805) was armed with more or less the same weaponry that the army of Louis XVI had used. Napoleon himself, despite being an artilleryman, had little interest in new weapons, even though scientists and inventors tried to persuade him to fund the development of flying machines, submarines and rockets.

Science, industry and military technology intertwined only with the advent of the capitalist system and the Industrial Revolution. Once this relationship was established, however, it quickly transformed the world.

在十五和十六世紀，情況開始改變，但在大多數統治者有興趣投資研究和開發新武器之前，還需要200年的時間。物流和策略對戰爭結果的影響，仍比科技更為重要。拿破崙的軍事機器在奧斯特利茨戰役(1805)中擊敗了歐洲諸國軍隊，但使用的武器與路易十六的軍隊幾乎相同。拿破崙本人雖是炮兵，但對新武器沒有太多興趣，即使科學家和發明家嘗試說服他資助飛行器、潛艇和火箭的研發。科學、工業和

軍事技術直到資本主義和工業革命的到來才交織在一起。然而，一旦建立了這種關係，它很快就改變了世界。

The Ideal of Progress

Until the Scientific Revolution most human cultures did not believe in progress. They thought the golden age was in the past, and that the world was stagnant, if not deteriorating. Strict adherence to the wisdom of the ages might perhaps bring back the good old times, and human ingenuity might conceivably improve this or that facet of daily life. However, it was considered impossible for human know-how to overcome the world's fundamental problems. If even Muhammad, Jesus, Buddha and Confucius – who knew everything there is to know – were unable to abolish famine, disease, poverty and war from the world, how could we expect to do so?

Many faiths believed that some day a messiah would appear and end all wars, famines and even death itself. But the notion that humankind could do so by discovering new knowledge and inventing new tools was worse than ludicrous – it was hubris. The story of the Tower of Babel, the story of Icarus, the story of the Golem and countless other myths taught people that any attempt to go beyond human limitations would inevitably lead to disappointment and disaster.

在科學革命之前，大多數人類文化並不相信進步。他們認為黃金時代已經過去，世界停滯不前，甚至可能在惡化。嚴格遵循古人智慧或許可以帶回美好的時光，人類的機智或許可以改善日常生活的某些方面。然而，人類的聰明才智不可能克服世界的根本問題。即使是穆罕默德、耶穌、佛陀和孔子——這些充滿智慧的人——都無法從世界上消除飢荒、疾病、貧困和戰爭，我們如何能期望做到呢？許多信仰認為，總有一天，彌賽亞會出現，結束一切戰爭、飢荒，甚至連死亡本身也能被終結。但是，通過發現新知識和發明新工具來實現人類這個目標，不僅荒謬，而且是傲慢自大的表現。巴別塔的故事、伊卡洛斯的故事、哥倫布制造的人偶的故事以及其他無數的神話都告訴人們，任何超越人類自身限制的嘗試都必然會導致失望和災難。

When modern culture admitted that there were many important things that it still did not know, and when that admission of ignorance was married to the idea that scientific discoveries could give us new powers, people began suspecting that real progress might be possible after all. As science began to solve one unsolvable problem after another, many became convinced that humankind could overcome any and every problem by acquiring and applying new knowledge. Poverty, sickness, wars, famines, old age and death itself were not the inevitable fate of humankind. They were simply the fruits of our ignorance.



34. Benjamin Franklin disarming the gods .

A famous example is lightning. Many cultures believed that lightning was the hammer of an angry god, used to punish sinners. In the middle of the eighteenth century, in one of the most celebrated experiments in scientific history, Benjamin Franklin flew a kite during a lightning storm to test the hypothesis that lightning is simply an electric current. Franklins empirical observations, coupled with his knowledge about the qualities of electrical energy, enabled him to invent the lightning rod and disarm the gods.

現代文化承認仍有許多重要的事情不知道，當這種認知融合科學發現可以賦予我們新力量的想法時，人們開始懷疑真正的進步可能成為現實。隨著科學開始一個接一個解決不可解決的問題，許多人相信，人類可以通過獲得和應用新知識克服任何問題。貧困、疾病、戰爭、飢荒、老年和死亡本身不是人類不可避免的命運。它們只是我們無知的結果。34. 富蘭克林解除天神的武裝一個著名的例子是閃電。許多文化認為閃電是生氣的神的錘，用來懲罰罪人。在18世紀中葉，本傑明·富蘭克林在一次雷雨中放風箏，測試閃電只是一種電流的假設，是科學史上最著名的實驗之一。富蘭克林的實驗觀察和對電能量質量的了解使他發明了避雷針，解除了上帝的武裝。

Poverty is another case in point. Many cultures have viewed poverty as an inescapable part of this imperfect world. According to the New Testament, shortly before the crucifixion a woman anointed Christ with precious oil worth 300 denarii. Jesus' disciples scolded the woman for wasting such a huge sum of money instead of giving it to the poor, but Jesus defended her, saying that 'The poor you will always have with you, and you can help them any time you want. But you will not always have me' (Mark 14:7). Today, fewer and fewer people, including fewer and fewer Christians, agree with Jesus on this matter. Poverty is increasingly seen as a technical problem amenable to intervention. It's common wisdom that policies based on the latest findings in agronomy, economics, medicine and sociology can eliminate poverty.

貧窮是另一個例子。許多文化都認為貧窮是這個不完美世界無法逃避的部分。根據新約聖經，在耶穌被釘十字架之前，一個女人拿起價值三百個「銀錢」的珍貴油膏塗抹在耶穌身上。耶穌的門徒責備這個女人花這麼大的一筆錢，而不是給予窮人，但耶穌為她辯護，說：“常有窮人和你們同在，凡要，你們隨時可以幫助他們；只是我不常與你們同在”（馬可福音14: 7）。如今，越來越少的人，包括越來越少的基督徒在這個問題上同意耶穌的看法。貧窮越來越被認為是一個可干預的技術問題。普遍認為，基於最新的農藝、經濟學、醫學和社會學發現的政策可以消除貧窮。

And indeed, many parts of the world have already been freed from the worst forms of deprivation. Throughout history, societies have suffered from two kinds of poverty: social poverty, which withholds from some people the

opportunities available to others; and biological poverty, which puts the very lives of individuals at risk due to lack of food and shelter. Perhaps social poverty can never be eradicated, but in many countries around the world biological poverty is a thing of the past.

Until recently, most people hovered very close to the biological poverty line, below which a person lacks enough calories to sustain life for long. Even small miscalculations or misfortunes could easily push people below that line, into starvation. Natural disasters and man-made calamities often plunged entire populations over the abyss, causing the death of millions. Today most of the world's people have a safety net stretched below them. Individuals are protected from personal misfortune by insurance, state-sponsored social security and a plethora of local and international NGOs. When calamity strikes an entire region, worldwide relief efforts are usually successful in preventing the worst. People still suffer from numerous degradations, humiliations and poverty-related illnesses, but in most countries nobody is starving to death. In fact, in many societies more people are in danger of dying from obesity than from starvation.

世界上許多地區已經擺脫了最嚴重的貧困。在歷史上，社會一直遭受著兩種貧困：社會貧困，使有些人無法享有其他人可以得到的機會；以及生物貧困，由於缺乏食物和住所而使個人的生命處於危險之中。也許社會貧困永遠無法消除，但在世界上許多國家，生物貧困已經成為過去的事情。直到最近，大多數人都非常接近生物貧困線以下，這意味著一個人缺乏足夠的營養來維持長期生存。即使是小小的錯誤或不幸，也很容易讓人們跌破這條線，陷入饑餓之中。自然災害和人為災難常常讓整個人口陷入深淵，造成數百萬人死亡。如今，世界上大多數人都有一個攔阻他們墜落的安全網。人們通過保險、政府贊助的社會保障和眾多的本地和國際NGO受到個人不幸的保護。當災難襲擊整個地區時，全球性的救援努力通常能夠成功地防止最壞情況的發生。人們仍然受到許多貧困相關的侮辱、慚愧和疾病的折磨，但在大多數國家，沒有人會餓死。事實上，在許多社會中，更多的人面臨的危險是由於肥胖而非饑餓導致的死亡。

The Gilgamesh Project

Of all mankind's ostensibly insoluble problems, one has remained the most vexing, interesting and important: the problem of death itself. Before the late modern era, most religions and ideologies took it for granted that death was our inevitable fate. Moreover, most faiths turned death into the main source of meaning in life. Try to imagine Islam, Christianity or the ancient Egyptian religion in a world without death. These creeds taught people that they must come to terms with death and pin their hopes on the afterlife, rather than seek to overcome death and live for ever here on earth. The best minds were busy giving meaning to death, not trying to escape it.

That is the theme of the most ancient myth to come down to us – the Gilgamesh myth of ancient Sumer. Its hero is the strongest and most capable man in the world, King Gilgamesh of Uruk, who could defeat anyone in battle. One day, Gilgamesh's best friend, Enkidu, died. Gilgamesh sat by the body and observed it for many days, until he saw a worm dropping out of his friend's nostril. At that moment Gilgamesh was gripped by a terrible horror, and he resolved that he himself would never die. He would somehow find a way to defeat death. Gilgamesh then undertook a journey to the end of the universe, killing lions, battling scorpion-men and finding his way into the underworld. There he shattered the stone giants of Urshanabi and the ferryman of the river of the dead, and found Utnapishtim, the last survivor of the primordial flood. Yet Gilgamesh failed in his quest. He returned home empty-handed, as mortal as ever, but with one new piece of wisdom. When the gods created man, Gilgamesh had learned, they set death as man's inevitable destiny, and man must learn to live with it.

在所有看似無法解決的問題中，有一個問題一直是最令人困擾、有趣和重要的：死亡本身的問題。在現代以前，大多數宗教和意識形態都視死亡為我們不可避免的命運。此外，大多數信仰將死亡轉化為生命中的主要意義來源。試想一下伊斯蘭教、基督教或古埃及宗教在一個沒有死亡的世界中的情況。這些信仰教導人們必須接受死亡，把希望寄托在來世，而不是試圖克服死亡，想要在地球上永生。最優秀的思想家忙於賦予死亡意義，而不是試圖逃避它。這是最古老的神話中最主題的內容，《吉爾伽美什史詩》源自古蘇美爾。它的主人公是世界上最強大和最能幹的男人，烏魯克國王吉爾伽美什，他可以擊敗任何人。有一天，吉爾伽美什最好的朋友恩基杜死了。吉爾伽美什坐在屍體旁觀察了許多天，直到他看到一條蟲從朋友的鼻孔裡爬了出來。在

那一刻，吉爾伽美什被一種可怕的恐懼所籠罩，他決定自己永遠不會死。他會想辦法戰勝死亡。吉爾伽美什接著展開了一次旅程，殺死獅子、與蝎子人作戰，進入了地獄。在那裡，他粉碎了烏爾沙納比的石巨人和死亡河上的渡船人，找到了泛濫大洪水最後的倖存者烏特那比斯帝姆。然而，吉爾伽美什的尋求失敗了。他空手而歸，仍然是凡人，但學到了一條新的智慧。吉爾伽美什學到，當神創造人類時，他們設定了死亡為人類不可避免的命運，人類必須學會與之共處。

Disciples of progress do not share this defeatist attitude. For men of science, death is not an inevitable destiny, but merely a technical problem. People die not because the gods decreed it, but due to various technical failures – a heart attack, cancer, an infection. And every technical problem has a technical solution. If the heart flutters, it can be stimulated by a pacemaker or replaced by a new heart. If cancer rampages, it can be killed with drugs or radiation. If bacteria proliferate, they can be subdued with antibiotics. True, at present we cannot solve all technical problems. But we are working on them. Our best minds are not wasting their time trying to give meaning to death. Instead, they are busy investigating the physiological, hormonal and genetic systems responsible for disease and old age. They are developing new medicines, revolutionary treatments and artificial organs that will lengthen our lives and might one day vanquish the Grim Reaper himself.

進步的信徒並不認同這種失敗主義的態度。對於科學家而言，死亡不是必然的命運，而僅是一個技術問題。人們死亡不是因為神明如此安排，而是由於各種技術故障 - 心臟病、癌症、感染等等。每個技術問題都有技術解決方案。如果心臟出現跳動，可以通過起搏器刺激或換新心臟來解決。如果癌細胞猖獗，可以使用藥物或放射線治療擊敗它。如果細菌繁殖，可以用抗生素控制。當然，目前我們無法解決所有技術問題。但我們正在繼續研究。我們最好的頭腦不浪費時間試圖賦予死亡意義，而是忙於研究導致疾病和老年的生理、荷爾蒙和基因系統。他們正在開發新藥、革命性治療和人造器官，這將延長我們的生命，並有望有一天擊敗死神本人。

Until recently, you would not have heard scientists, or anyone else, speak so bluntly. ‘Defeat death?! What nonsense! We are only trying to cure cancer, tuberculosis and Alzheimer’s disease,’ they insisted. People avoided the issue of death because the goal seemed too elusive. Why create unreasonable

expectations? We're now at a point, however, where we can be frank about it. The leading project of the Scientific Revolution is to give humankind eternal life. Even if killing death seems a distant goal, we have already achieved things that were inconceivable a few centuries ago. In 1199, King Richard the Lionheart was struck by an arrow in his left shoulder. Today we'd say he incurred a minor injury. But in 1199, in the absence of antibiotics and effective sterilisation methods, this minor flesh wound turned infected and gangrene set in. The only way to stop the spread of gangrene in twelfth-century Europe was to cut off the infected limb, impossible when the infection was in a shoulder. The gangrene spread through the Lionheart's body and no one could help the king. He died in great agony two weeks later.

直到最近，你不會聽到科學家或其他任何人如此直言不諱。「打敗死亡？太荒唐了！我們只是想治愈癌症、結核病和老年痴呆症，」他們堅持著。人們避免討論死亡，因為這個目標似乎太遙不可及。為什麼要創造不合理的期望呢？現在，我們已經到了可以坦率談論這件事的地步。科學革命的主要項目是讓人類享有永恆的生命。即使殺死死亡似乎是一個遙遠的目標，我們已經實現了在幾個世紀前無法想像的事情。1199年，獅心王理查被一箭射中了左肩。今天，我們會說他只是遭受了輕傷。但在沒有抗生素和有效的消毒方法的1199年，這個小小的傷口變成了感染，產生了壞疽。在十二世紀歐洲，防止壞疽蔓延的唯一辦法是切除受感染的肢體，但如果感染發生在肩膀，這是不可能的。壞疽在獅心王的身體中擴散，沒有人能幫助國王。他在兩個星期之後痛苦地去世了。

As recently as the nineteenth century, the best doctors still did not know how to prevent infection and stop the putrefaction of tissues. In field hospitals doctors routinely cut off the hands and legs of soldiers who received even minor limb injuries, fearing gangrene. These amputations, as well as all other medical procedures (such as tooth extraction), were done without any anaesthetics. The first anaesthetics – ether, chloroform and morphine – entered regular usage in Western medicine only in the middle of the nineteenth century. Before the advent of chloroform, four soldiers had to hold down a wounded comrade while the doctor sawed off the injured limb. On the morning after the battle of Waterloo (1815), heaps of sawn-off hands and legs could be seen adjacent to the field hospitals. In those days, carpenters and butchers who enlisted to the army were often sent to serve in the medical

corps, because surgery required little more than knowing your way with knives and saws.

直到19世紀，最優秀的醫生仍然不知道如何預防感染和阻止組織腐爛。在野戰醫院中，醫生經常為接受即使是輕微的肢體傷害的士兵切斷手腳，以免引起壞死。這些截肢以及所有其他醫療程序（例如拔牙）均在沒有任何麻醉劑的情況下進行。第一批麻醉劑——乙醚、氯仿和嗎啡——直到19世紀中葉才在西方醫學中開始使用。在氯仿問世之前，四名士兵不得不壓住一名受傷的戰友，而醫生則在鋸斷受傷的肢體時執刀。在滑鐵盧戰役（1815年）的第二天早晨，可以看到許多斷手斷腳的堆積物與野戰醫院相鄰。在那些日子裡，木匠和屠夫通常被徵召入伍服役醫療隊，因為手術只需要稍微熟悉刀具即可。

In the two centuries since Waterloo, things have changed beyond recognition. Pills, injections and sophisticated operations save us from a spate of illnesses and injuries that once dealt an inescapable death sentence. They also protect us against countless daily aches and ailments, which premodern people simply accepted as part of life. The average life expectancy jumped from around twenty-five to forty years, to around sixty-seven in the entire world, and to around eighty years in the developed world. ⁸

Death suffered its worst setbacks in the arena of child mortality. Until the twentieth century, between a quarter and a third of the children of agricultural societies never reached adulthood. Most succumbed to childhood diseases such as diphtheria, measles and smallpox. In seventeenth-century England, 150 out of every 1,000 newborns died during their first year, and a third of all children were dead before they reached fifteen. ⁹ Today, only five out of 1,000 English babies die during their first year, and only seven out of 1,000 die before age fifteen. ¹⁰

自滑銳之戰以來的兩個世紀，一切都已經發生了翻天覆地的變化。藥丸、注射和精密手術能夠拯救我們免受以往不可避免的死亡威脅。它們還能夠保護我們免受無數日常疼痛和疾病之苦，而這些在古代人眼中只是生活的一部分。平均壽命從約二十五歲增長到全球約六十七歲，在發達國家增長到約八十歲。死亡在兒童死亡率方面受到了最嚴重的打擊。直到二十世紀，農業社會的孩子中有四分之一到三分之一從未成年。大多數人都死於小兒病如白喉、麻疹和天花。在17世紀的

英國，每1,000名新生兒中有150人在其第一年內死亡，三分之一的兒童在15歲之前去世。如今，在英國，每1,000名嬰兒只有五名在其第一年內死亡，只有七名在15歲之前去世。

We can better grasp the full impact of these figures by setting aside statistics and telling some stories. A good example is the family of King Edward I of England (1237–1307) and his wife, Queen Eleanor (1241–90). Their children enjoyed the best conditions and the most nurturing surroundings that could be provided in medieval Europe. They lived in palaces, ate as much food as they liked, had plenty of warm clothing, well-stocked fireplaces, the cleanest water available, an army of servants and the best doctors. The sources mention sixteen children that Queen Eleanor bore between 1255 and 1284:

- 1 . An anonymous daughter, born in 1255, died at birth.
- 2 . A daughter, Catherine, died either at age one or age three.
- 3 . A daughter, Joan, died at six months.
- 4 . A son, John, died at age five.

我們可以暫時擱置統計數字，講幾個故事來更好地了解這些數字的真正影響。一個很好的例子是英國國王愛德華一世（1237-1307）和他的妻子埃莉諾皇后（1241-1290）的家庭。他們的孩子享受了中世紀歐洲所能提供的最好的條件和最優質的環境。他們住在皇宮中，食物任吃，有充足的暖和衣物、裝著最純淨的水源的壁爐，一支供應充足的僕人隊伍和最好的醫生。資料顯示，埃莉諾皇后在1255年至1284年期間共生育了十六個孩子： 1.一個匿名女兒，生於1255年，剛出生即死亡。 2.一個女兒凱瑟琳，在一歲或三歲時去世。 3.一個女兒琼，在六個月時去世。 4.一個兒子約翰，在五歲時去世。

- 5 . A son, Henry, died at age six.
- 6 . A daughter, Eleanor, died at age twenty-nine.
- 7 . An anonymous daughter died at five months.

8 . A daughter, Joan, died at age thirty-five.

9 . A son, Alphonso, died at age ten.

10 . A daughter, Margaret, died at age fifty-eight.

11 . A daughter, Berengeria, died at age two.

12 . An anonymous daughter died shortly after birth.

13 . A daughter, Mary, died at age fifty-three.

14 . An anonymous son died shortly after birth.

15 . A daughter, Elizabeth, died at age thirty-four.

16 . A son, Edward.

The youngest, Edward, was the first of the boys to survive the dangerous years of childhood, and at his fathers death he ascended the English throne as King Edward II. In other words, it took Eleanor sixteen tries to carry out the most fundamental mission of an English queen – to provide her husband with a male heir. Edward II's mother must have been a woman of exceptional patience and fortitude. Not so the woman Edward chose for his wife, Isabella of France. She had him murdered when he was forty-three. [11](#)

5. 一個六歲的兒子，亨利去世了。 6. 一個二十九歲的女兒，艾莉諾去世了。 7. 一個五個月大的匿名女兒去世了。 8. 一個三十五歲的女兒，瓊去世了。 9. 一個十歲的兒子，阿方索去世了。 10. 一個五十八歲的女兒，瑪格麗特去世了。 11. 一個兩歲的女兒，貝倫吉麗亞去世了。 12. 一個匿名女兒剛出生不久就去世了。 13. 一個五十三歲的女兒瑪麗去世了。 14. 一個匿名兒子剛出生不久就去世了。 15. 一個三十四歲的女兒伊莉莎白去世了。 16. 一個兒子愛德華。 年紀最小的愛德華是男孩中第一個度過兒童危險年齡的人，當他的父親去世時，他登基成為英國國王愛德華二世。換句話說，艾莉諾試了十六次才完成英國皇后最基本的任務 - 紿丈夫生下一個男性後嗣。愛德華二世的母親必定是

一位具有特殊耐性和勇氣的女性。然而，愛德華選擇做他妻子的伊莎貝拉不同，她在他四十三歲時下令謀殺了他。

To the best of our knowledge, Eleanor and Edward I were a healthy couple and passed no fatal hereditary illnesses on to their children. Nevertheless, ten out of the sixteen – 62 per cent – died during childhood. Only six managed to live beyond the age of eleven, and only three – just 18 per cent – lived beyond the age of forty. In addition to these births, Eleanor most likely had a number of pregnancies that ended in miscarriage. On average, Edward and Eleanor lost a child every three years, ten children one after another. It's nearly impossible for a parent today to imagine such loss.

How long will the Gilgamesh Project – the quest for immortality – take to complete? A hundred years? Five hundred years? A thousand years? When we recall how little we knew about the human body in 1900, and how much knowledge we have gained in a single century, there is cause for optimism. Genetic engineers have recently managed to double the average life expectancy of *Caenorhabditis elegans* worms.¹² Could they do the same for *Homo sapiens*? Nanotechnology experts are developing a bionic immune system composed of millions of nano-robots, who would inhabit our bodies, open blocked blood vessels, fight viruses and bacteria, eliminate cancerous cells and even reverse ageing processes.¹³ A few serious scholars suggest that by 2050, some humans will become a-mortal (not immortal, because they could still die of some accident, but a-mortal, meaning that in the absence of fatal trauma their lives could be extended indefinitely).

據我們所知，Eleanor和Edward I是一對健康的夫婦，沒有將致命的遺傳疾病傳給他們的孩子。然而，在十六個孩子中，有十個孩子，佔62%，在童年時期死去。只有六個孩子超過了十一歲，只有三個孩子（僅佔18%）超過了四十歲。除了這些誕生，Eleanor很可能經歷過多次以流產結束的懷孕。平均而言，Edward和Eleanor每三年失去一個孩子，十個孩子接連不斷地逝去。對於今天的父母來說，這種損失幾乎是無法想像的。吉爾伽美什計劃-尋求永生-需要多久才能完成？一百年？五百年？一千年？當我們回想1900年我們對人體了解多少，再看看我們在一個世紀內獲得了多少知識，這令人樂觀。基因工程師最近成功將*Caenorhabditis elegans*蟲的平均壽命加倍。¹²他們能否為 *Homo sapiens*做到同樣的事情呢？納米技術專家正在開發由數百萬個

納米機器人組成的仿生免疫系統，這些機器人將居住在我們的身體中，開放阻塞的血管，對抗病毒和細菌，消除癌細胞，甚至逆轉衰老過程。¹³一些嚴肅的學者建議，到2050年，一些人類將成為不死之身（不是不死，因為他們仍然可能死於某些意外，但是a-mortal，這意味著在沒有致命創傷的情況下，他們的壽命可以無限延長）。

Whether or not Project Gilgamesh succeeds, from a historical perspective it is fascinating to see that most late-modern religions and ideologies have already taken death and the afterlife out of the equation. Until the eighteenth century, religions considered death and its aftermath central to the meaning of life. Beginning in the eighteenth century, religions and ideologies such as liberalism, socialism and feminism lost all interest in the afterlife. What, exactly, happens to a Communist after he or she dies? What happens to a capitalist? What happens to a feminist? It is pointless to look for the answer in the writings of Marx, Adam Smith or Simone de Beauvoir. The only modern ideology that still awards death a central role is nationalism. In its more poetic and desperate moments, nationalism promises that whoever dies for the nation will forever live in its collective memory. Yet this promise is so fuzzy that even most nationalists do not really know what to make of it.

無論《吉爾伽美什計畫》是否成功，歷史角度來看，最近代的大多數宗教和意識形態已經把死亡和來世的概念排除在外，這十分有趣。在18世紀之前，宗教認為死亡及其後果對生命意義至關重要。從18世紀開始，自由主義、社會主義和女性主義等意識形態和宗教對來世失去了興趣。共產主義者死後會發生什麼？資本主義者呢？女性主義者又會怎樣？在馬克思、亞當·斯密或西蒙·波伏娃的著作中尋找答案是毫無意義的。唯一在現代仍將死亡賦予中心作用的意識形態是民族主義。在其更富詩意和絕望時刻，民族主義承諾為國捐軀者將永遠活在國家集體記憶中。然而，這個承諾是如此含糊不清，以至於大多數民族主義者都不知道如何解讀它。

The Sugar Daddy of Science

We are living in a technical age. Many are convinced that science and technology hold the answers to all our problems. We should just let the scientists and technicians go on with their work, and they will create heaven

here on earth. But science is not an enterprise that takes place on some superior moral or spiritual plane above the rest of human activity. Like all other parts of our culture, it is shaped by economic, political and religious interests.

Science is a very expensive affair. A biologist seeking to understand the human immune system requires laboratories, test tubes, chemicals and electron microscopes, not to mention lab assistants, electricians, plumbers and cleaners. An economist seeking to model credit markets must buy computers, set up giant databanks and develop complicated data-processing programs. An archaeologist who wishes to understand the behaviour of archaic hunter-gatherers must travel to distant lands, excavate ancient ruins and date fossilised bones and artefacts. All of this costs money.

我們生活在一個技術時代。許多人相信科學和技術能夠解決我們所有的問題。我們應該讓科學家和技術人員繼續他們的工作，他們就會在地球上創造天堂。但科學不是在某個高尚的道德或精神層面上進行的企業。就像我們文化的其他部分一樣，它是由經濟、政治和宗教利益塑造的。科學是一個非常昂貴的事業。一個想要瞭解人類免疫系統的生物學家需要實驗室、試管、化學藥品和電子顯微鏡，更不用說實驗室助手、電工、水暖工和清潔工了。一個想要建模信貸市場的經濟學家必須買電腦、建立巨大的數據庫並開發複雜的數據處理程序。一個想要瞭解古老的獵人採集者行為的考古學家必須去遠方旅行，挖掘古代遺跡並測定化石骨骼和手工藝品的年代。所有這一切都需要花費金錢。

During the past 500 years modern science has achieved wonders thanks largely to the willingness of governments, businesses, foundations and private donors to channel billions of dollars into scientific research. These billions have done much more to chart the universe, map the planet and catalogue the animal kingdom than did Galileo Galilei, Christopher Columbus and Charles Darwin. If these particular geniuses had never been born, their insights would probably have occurred to others. But if the proper funding were unavailable, no intellectual brilliance could have compensated for that. If Darwin had never been born, for example, we'd today attribute the theory of evolution to Alfred Russel Wallace, who came up with the idea of evolution via natural selection independently of Darwin and just a few years

later. But if the European powers had not financed geographical, zoological and botanical research around the world, neither Darwin nor Wallace would have had the necessary empirical data to develop the theory of evolution. It is likely that they would not even have tried.

在過去的 500 年中，現代科學實現了許多奇跡，這在很大程度上是因為政府、企業、基金會和私人捐助者願意將數十億美元投入科學研究。這些巨額資金不僅讓我們更加了解宇宙、地球和動物王國，而且比著名的科學家伽利略、哥倫布和達爾文所做的更具有意義。如果這些天才從未出生，他們的見解可能會被其他人想到。但如果適當的資金不可用，即使有智者的才華，也無法彌補這一點。例如，如果達爾文從未出生，我們今天會將進化論歸功於阿爾弗雷德·羅素·華萊士，他獨立想出了自然選擇進化的理論，比達爾文早了幾年。但如果歐洲強國沒有為全球地理、動物學和植物學研究提供資金支持，達爾文和華萊士都不可能有必要的實證數據來發展進化論。他們甚至可能不會嘗試。

Why did the billions start flowing from government and business coffers into labs and universities? In academic circles, many are naïve enough to believe in pure science. They believe that government and business altruistically give them money to pursue whatever research projects strike their fancy. But this hardly describes the realities of science funding.

Most scientific studies are funded because somebody believes they can help attain some political, economic or religious goal. For example, in the sixteenth century, kings and bankers channelled enormous resources to finance geographical expeditions around the world but not a penny for studying child psychology. This is because kings and bankers surmised that the discovery of new geographical knowledge would enable them to conquer new lands and set up trade empires, whereas they couldn't see any profit in understanding child psychology.

為什麼政府和企業的數十億資金開始流向實驗室和大學？在學術圈中，許多人天真地相信純科學的存在。他們認為政府和企業出於利他主義，給予他們資金，讓他們追求任何自己感興趣的研究項目。但這並不完全描述了科學資金的現實情況。大多數科學研究之所以獲得資助，是因為某些人認為它們有助於實現某些政治、經濟或宗教目標。

例如，在16世紀，國王和銀行家投入大量資源，資助探險家在世界各地進行地理探險，但卻不為研究兒童心理學投一分錢。這是因為國王和銀行家推測，新地理知識的發現將使他們能夠征服新土地並建立貿易帝國，而他們無法看到在了解兒童心理學上的任何利潤。

In the 1940s the governments of America and the Soviet Union channelled enormous resources to the study of nuclear physics rather than underwater archaeology. They surmised that studying nuclear physics would enable them to develop nuclear weapons, whereas underwater archaeology was unlikely to help win wars. Scientists themselves are not always aware of the political, economic and religious interests that control the flow of money; many scientists do, in fact, act out of pure intellectual curiosity. However, only rarely do scientists dictate the scientific agenda.

Even if we wanted to finance pure science unaffected by political, economic or religious interests, it would probably be impossible. Our resources are limited, after all. Ask a congressman to allocate an additional million dollars to the National Science Foundation for basic research, and he'll justifiably ask whether that money wouldn't be better used to fund teacher training or to give a needed tax break to a troubled factory in his district. To channel limited resources we must answer questions such as 'What is more important?' and 'What is good?' And these are not scientific questions. Science can explain what exists in the world, how things work, and what might be in the future. By definition, it has no pretensions to knowing what *should* be in the future. Only religions and ideologies seek to answer such questions.

在1940年代，美國和蘇聯政府將龐大的資源投入到核物理研究而非水下考古中。他們認為研究核物理能夠幫助他們發展核武器，而水下考古則不太可能幫助贏得戰爭。科學家並不總是意識到控制資金流動的政治、經濟和宗教利益。事實上，許多科學家僅僅出於純粹的智識好奇而行事。但是，科學家很少獨裁科學議程。即使我們想要融資不受政治、經濟或宗教利益影響的純粹科學，這也可能不可能。畢竟，我們的資源是有限的。如果要求國會議員為基礎研究增加一百萬美元的資金，他就會合理地問：這些資金是否不如用於資助師資培訓，或者給他選區的受困工廠提供所需的減稅措施呢？為了將有限的資源投入到正確的領域，我們必須回答像“什麼更重要？”和“什麼是好的？”這

樣的問題。而這些不是科學問題。科學可以解釋世界上存在的事物、事物如何運作以及未來可能會有什麼。根據定義，它不可能知道未來應該發生什麼。只有宗教和意識形態才尋求回答這些問題。

Consider the following quandary: two biologists from the same department, possessing the same professional skills, have both applied for a million-dollar grant to finance their current research projects. Professor Slughorn wants to study a disease that infects the udders of cows, causing a 10 per cent decrease in their milk production. Professor Sprout wants to study whether cows suffer mentally when they are separated from their calves. Assuming that the amount of money is limited, and that it is impossible to finance both research projects, which one should be funded?

There is no scientific answer to this question. There are only political, economic and religious answers. In today's world, it is obvious that Slughorn has a better chance of getting the money. Not because udder diseases are scientifically more interesting than bovine mentality, but because the dairy industry, which stands to benefit from the research, has more political and economic clout than the animal-rights lobby.

考虑以下难题：同一系所的两位生物学家，拥有相同的专业技能，都申请了一笔一百万美元的拨款来资助他们目前的研究项目。斯拉格霍恩教授想研究一种影响奶牛乳房的疾病，导致它们的产奶量下降10%。斯普劳特教授想研究当母牛与它们的小牛分离时它们是否会遭受精神上的折磨。假设金额有限，而且不可能资助两个研究项目，那么应该资助哪个？这个问题没有科学答案。只有政治，经济和宗教答案。在今天的世界中，显然斯拉格霍恩有更好的机会获得资金。不是因为乳房疾病在科学上比牛的心态更有趣，而是因为从中受益的乳制品行业比动物权利游说团体拥有更多的政治和经济影响力。

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.

或许在一个严格奉行印度教的社会中，牛是神圣的，或者在一个致力于动物权利的社会中，Sprout教授将有更好的机会。但只要她生活在一个把牛奶的商业潜力和人类公民的健康价值高于牛的感受的社会中，她最好写出研究提案来吸引这些假设。例如，她可以写道“抑郁症会导致乳制品产量下降。如果我们了解奶牛的心理世界，我们可以开发精神药物来改善它们的情绪，从而使牛奶的产量提高10%。我估计这是一项年全球市场价值250亿美元的乳牛精神医学药物市场。”科学无法确定自己的优先事项。它也不能确定如何处理其发现。例如，从纯粹的科学观点来看，我们应该如何处理我们对基因的不断增长的认识。我们应该利用这些知识来治愈癌症，创造一群基因工程超人，还是工程具有超大奶制品的奶牛？显然，一个自由主义政府、一个共产主义政府、一个纳粹政府和一个资本主义商业公司会为完全不同的目的利用同样的科学发现，并没有科学的理由来偏好其中任何一种用途。

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 were latched to one another, and then learn how both were hitched up to the money pump of capitalism.

簡單來說，科學研究只有在與某些宗教或意識形態聯盟中才能蓬勃發展。這種意識形態證明了研究的成本。作為交換，這種意識形態影響科學議程，決定如何處理發現。因此，為了理解人類如何到達阿拉莫戈多和月球，而不是其他任何的目的地，光查看物理學家、生物學家和社會學家的成就是不夠的。我們必須考慮形塑物理學、生物學和社會學的意識形態、政治和經濟力量，推動它們走向某些方向，而忽略其他方向。特別值得關注的是兩股力量：帝國主義和資本主義。科學、帝國和資本之間的反饋迴路可能是歷史上500年來的主要引擎。以下章節將分析它的運作方式。首先，我們將看看如何將科學和帝國的雙重渦輪結合在一起，然後了解如何將它們與資本主義的資金泵聯繫起來。

15

The Marriage of Science and Empire

HOW FAR IS THE SUN FROM THE EARTH? It's a question that intrigued many early modern astronomers, particularly after Copernicus argued that the sun, rather than the earth, is located at the centre of the universe. A number of astronomers and mathematicians tried to calculate the distance, but their methods provided widely varying results. A reliable means of making the measurement was finally proposed in the middle of the eighteenth century. Every few years, the planet Venus passes directly between the sun and the earth. The duration of the transit differs when seen from distant points on the earth's surface because of the tiny difference in the angle at which the observer sees it. If several observations of the same transit were made from different continents, simple trigonometry was all it would take to calculate our exact distance from the sun.

太陽距離地球有多遠？這是讓許多早期現代天文學家感到好奇的問題，特別是在哥白尼主張太陽而非地球位於宇宙中心之後。許多天文學家和數學家嘗試計算距離，但他們的方法結果大相逕庭。直到18世紀中葉，人們才提出了一種可靠的量測方法。每隔幾年，金星直接通過太陽和地球之間。由於觀察者看到的角度略有差異，這個通過的持續時間在地球表面的不同地點看到會有所不同。如果從不同的大陸進行了多次相同的觀測，只需要用簡單的三角學就可以計算出我們與太陽的確切距離。

Astronomers predicted that the next Venus transits would occur in 1761 and 1769. So expeditions were sent from Europe to the four corners of the world in order to observe the transits from as many distant points as possible. In 1761 scientists observed the transit from Siberia, North America, Madagascar and South Africa. As the 1769 transit approached, the European

scientific community mounted a supreme effort, and scientists were dispatched as far as northern Canada and California (which was then a wilderness). The Royal Society of London for the Improvement of Natural Knowledge concluded that this was not enough. To obtain the most accurate results it was imperative to send an astronomer all the way to the south-western Pacific Ocean.

The Royal Society resolved to send an eminent astronomer, Charles Green, to Tahiti, and spared neither effort nor money. But, since it was funding such an expensive expedition, it hardly made sense to use it to make just a single astronomical observation. Green was therefore accompanied by a team of eight other scientists from several disciplines, headed by botanists Joseph Banks and Daniel Solander. The team also included artists assigned to produce drawings of the new lands, plants, animals and peoples that the scientists would no doubt encounter. Equipped with the most advanced scientific instruments that Banks and the Royal Society could buy, the expedition was placed under the command of Captain James Cook, an experienced seaman as well as an accomplished geographer and ethnographer.

天文學家預測下次金星凌日會在1761年和1769年發生。為了觀察盡可能多的遠方，歐洲派出遠征隊到世界各地觀測凌日。1761年，科學家們在西伯利亞、北美、馬達加斯加和南非觀測了凌日。隨著1769年的凌日日漸臨近，歐洲科學界開始全力策劃，並派出科學家前往加拿大北部和加州（當時是一片荒野）。倫敦皇家學會為改進自然知識而總結了這一點。為獲得最準確的結果，必須派遣一位天文學家前往西南太平洋。倫敦皇家學會決定派遣著名天文學家查爾斯·格林前往塔希提島，不惜投入資金。但是，由於這是一個昂貴的遠征，只用來進行單一的天文觀察無意義。格林被一支由各個學科的八名科學家領導的團隊陪同，由植物學家約瑟夫·班克斯和丹尼爾·索蘭德指揮。該團隊還包括專門負責繪製科學家們毫無疑問會遇到的新土地、植物、動物和人民的繪畫家。配備了班克斯和倫敦皇家學會可以購買的最先進科學儀器，此遠征隊由經驗豐富的海員、著名地理學家和民族學家詹姆斯·庫克船長指揮。

The expedition left England in 1768, observed the Venus transit from Tahiti in 1769, reconnoitred several Pacific islands, visited Australia and New

Zealand, and returned to England in 1771. It brought back enormous quantities of astronomical, geographical, meteorological, botanical, zoological and anthropological data. Its findings made major contributions to a number of disciplines, sparked the imagination of Europeans with astonishing tales of the South Pacific, and inspired future generations of naturalists and astronomers.

One of the fields that benefited from the Cook expedition was medicine. At the time, ships that set sail to distant shores knew that more than half their crew members would die on the journey. The nemesis was not angry natives, enemy warships or homesickness. It was a mysterious ailment called scurvy. Men who came down with the disease grew lethargic and depressed, and their gums and other soft tissues bled. As the disease progressed, their teeth fell out, open sores appeared and they grew feverish, jaundiced, and lost control of their limbs. Between the sixteenth and eighteenth centuries, scurvy is estimated to have claimed the lives of about 2 million sailors. No one knew what caused it, and no matter what remedy was tried, sailors continued to die in droves. The turning point came in 1747, when a British physician, James Lind, conducted a controlled experiment on sailors who suffered from the disease. He separated them into several groups and gave each group a different treatment. One of the test groups was instructed to eat citrus fruits, a common folk remedy for scurvy. The patients in this group promptly recovered. Lind did not know what the citrus fruits had that the sailors' bodies lacked, but we now know that it is vitamin C. A typical shipboard diet at that time was notably lacking in foods that are rich in this essential nutrient. On long-range voyages sailors usually subsisted on biscuits and beef jerky, and ate almost no fruits or vegetables.

遠征隊於1768年離開英國，於1769年在塔希提觀察金星凌日，勘察了多個太平洋島嶼，拜訪了澳大利亞和新西蘭，並於1771年返回英國。遠征隊帶回了大量的天文、地理、氣象、植物、動物和人類學資料。他們的發現為許多領域做出了重大貢獻，用令人驚奇的南太平洋故事激發了歐洲人的想象力，並啟發了未來一代的自然學家和天文學家。其中一個受益於庫克遠征的領域是醫學。當時，前往遠方海岸的船隻知道，超過一半的船員會在航程中死亡。罪魁禍首不是憤怒的土著，敵方軍艦或思鄉病，而是一種神秘的疾病叫做壞血病。患上這種病的人變得無精打采和沮喪，他們的牙齦和其他軟組織出血。疾病進展

後，他們的牙齒脫落，開放的傷口出現，他們發高燒，出現黃疸，失去了肢體控制。在16至18世紀期間，據估計壞血病奪去了約200萬海員的生命。沒有人知道它的原因，無論嘗試了哪種治療方法，船員繼續大量死亡。轉折點是在1747年，當時一名英國醫生詹姆斯·林德對患有這種疾病的船員進行了對照實驗。他將他們分成幾組，給每組不同的治療。其中一個實驗組被指示食用含有維生素C的柑橘類水果，這是治療壞血病的常見民間療法。該組患者立即康復。林德不知道柑橘水果具有哪些患者缺乏的成分，但現在我們知道它是維生素C。當時的typisch船隻飲食中缺乏這種重要營養素的食物。在長途航行中，船員通常以餅乾和牛肉干為食，幾乎不吃水果或蔬菜。

The Royal Navy was not convinced by Lind's experiments, but James Cook was. He resolved to prove the doctor right. He loaded his boat with a large quantity of sauerkraut and ordered his sailors to eat lots of fresh fruits and vegetables whenever the expedition made landfall. Cook did not lose a single sailor to scurvy. In the following decades, all the world's navies adopted Cook's nautical diet, and the lives of countless sailors and passengers were saved.¹

However, the Cook expedition had another, far less benign result. Cook was not only an experienced seaman and geographer, but also a naval officer. The Royal Society financed a large part of the expedition's expenses, but the ship itself was provided by the Royal Navy. The navy also seconded eighty-five well-armed sailors and marines, and equipped the ship with artillery, muskets, gunpowder and other weaponry. Much of the information collected by the expedition – particularly the astronomical, geographical, meteorological and anthropological data – was of obvious political and military value. The discovery of an effective treatment for scurvy greatly contributed to British control of the world's oceans and its ability to send armies to the other side of the world. Cook claimed for Britain many of the islands and lands he 'discovered', most notably Australia. The Cook expedition laid the foundation for the British occupation of the south-western Pacific Ocean; for the conquest of Australia, Tasmania and New Zealand; for the settlement of millions of Europeans in the new colonies; and for the extermination of their native cultures and most of their native populations.²

皇家海軍並不信服林德的實驗成果，但詹姆斯·庫克相信他。他決定要證明這位醫生是對的。他讓自己的船載滿了大量的酸菜，每當探險隊登陸時，他命令水手們多吃新鮮水果和蔬菜。庫克沒有失去一名水手因為壞血病而死亡。接下來的幾十年裡，全世界的海軍都採用了庫克的航海飲食，數不清的水手和乘客得以保命。然而，庫克的探險還有一個遠非良性的後果。庫克不僅是一名經驗豐富的水手和地理學家，還是一名海軍軍官。皇家學會資助了探險隊的大部分開支，但船隻本身是由皇家海軍提供的。海軍還調派了85名武裝水手和海軍陸戰隊員，裝備了艦炮、火槍、火藥和其他武器。探險隊搜集的許多信息，特別是天文、地理、氣象和人類學數據，具有明顯的政治和軍事價值。對壞血病的有效治療方法的發現，大大有助於英國控制世界海洋和派遣軍隊到世界的另一端。庫克聲稱為英國贏得許多的發現的島嶼和領土，其中最著名的是澳大利亞。庫克的探險隊為英國佔領南太平洋奠定了基礎；為征服澳大利亞、塔斯馬尼亞和新西蘭；為數百萬歐洲殖民者在新殖民地的定居；以及為滅絕當地的文化和多數當地人口。

In the century following the Cook expedition, the most fertile lands of Australia and New Zealand were taken from their previous inhabitants by European settlers. The native population dropped by up to 90 per cent and the survivors were subjected to a harsh regime of racial oppression. For the Aborigines of Australia and the Maoris of New Zealand, the Cook expedition was the beginning of a catastrophe from which they have never recovered.

An even worse fate befell the natives of Tasmania. Having survived for 10,000 years in splendid isolation, they were completely wiped out, to the last man, woman and child, within a century of Cook's arrival. European settlers first drove them off the richest parts of the island, and then, coveting even the remaining wilderness, hunted them down and killed them systematically. The few survivors were hounded into an evangelical concentration camp, where well-meaning but not particularly open-minded missionaries tried to indoctrinate them in the ways of the modern world. The Tasmanians were instructed in reading and writing, Christianity and various 'productive skills' such as sewing clothes and farming. But they refused to learn. They became ever more melancholic, stopped having children, lost all interest in life, and finally chose the only escape route from the modern world of science and progress – death.

在庫克遠征之後的一個世紀裡，歐洲移民從澳大利亞和新西蘭最肥沃的土地上從前的居民手中奪走了這些土地。當地居民減少了高達90%，倖存者遭受了種族壓迫的嚴酷政策。對於澳大利亞的原住民和新西蘭的毛利人來說，庫克遠征是一個災難的開端，他們至今仍未恢復過來。塔斯馬尼亞的土著人遭遇了更慘痛的命運。他們在孤島上獨自維持了一萬年之久，但在庫克抵達的一個世紀內，他們全部被消滅殆盡，從男女老少到最後一人都被殺害。歐洲殖民者先驅逐他們離開該島最肥沃的部分，然後貪圖剩下的荒野，追捕並系統地屠殺他們。幾個倖存者被逼進了一個福音集中營，那裡有著設善意卻沒有特別開明的傳教士試圖灌輸他們現代世界的方式。塔斯馬尼亞人學習閱讀寫作、基督教和各種“生產技能”，如縫製衣服和農耕。但他們拒絕學習，變得愈來愈憂鬱，停止生育，失去對生活的興趣，最終選擇了唯一通往科學進步的現代世界之外的逃生之路-死亡。

Alas, science and progress pursued them even to the afterlife. The corpses of the last Tasmanians were seized in the name of science by anthropologists and curators. They were dissected, weighed and measured, and analysed in learned articles. The skulls and skeletons were then put on display in museums and anthropological collections. Only in 1976 did the Tasmanian Museum give up for burial the skeleton of Truganini, the last native Tasmanian, who had died a hundred years earlier. The English Royal College of Surgeons held on to samples of her skin and hair until 2002.

Was Cook's ship a scientific expedition protected by a military force or a military expedition with a few scientists tagging along? That's like asking whether your petrol tank is half empty or half full. It was both. The Scientific Revolution and modern imperialism were inseparable. People such as Captain James Cook and the botanist Joseph Banks could hardly distinguish science from empire. Nor could luckless Truganini.

唉，科學與進步甚至追隨到了死後。最後一批塔斯馬尼亞人的屍體被人類學家和策展人以科學之名抓住了。他們被解剖，稱重和測量，並在學術文章中進行了分析。頭骨和骸骨然後被放在博物館和人類學收藏中展示。直到1976年，塔斯馬尼亞博物館才放棄將去世100年的最後一位土著塔斯馬尼亞人特魯甘尼的骸骨安葬。英國皇家外科醫生協會一直保留她皮膚和頭髮的樣本直到2002年。庫克的船隻是受到軍事力量保護的科學考察隊還是一支只有少數科學家跟隨的軍事遠征隊？這

就像問您的油箱是半滿還是半空。它兩者兼備。科學革命和現代帝國主義不可分割。像詹姆斯·庫克船長和植物學家約瑟夫·班克斯這樣的人幾乎無法區分科學和帝國。不幸的特魯甘尼也是這樣。

Why Europe?

The fact that people from a large island in the northern Atlantic conquered a large island south of Australia is one of history's more bizarre occurrences. Not long before Cook's expedition, the British Isles and western Europe in general were but distant backwaters of the Mediterranean world. Little of importance ever happened there. Even the Roman Empire – the only important premodern European empire – derived most of its wealth from its North African, Balkan and Middle Eastern provinces. Rome's western European provinces were a poor Wild West, which contributed little aside from minerals and slaves. Northern Europe was so desolate and barbarous that it wasn't even worth conquering.



35. Truganini, the last native Tasmanian .

Only at the end of the fifteenth century did Europe become a hothouse of important military, political, economic and cultural developments. Between 1500 and 1750, western Europe gained momentum and became master of the 'Outer World', meaning the two American continents and the oceans. Yet even then Europe was no match for the great powers of Asia. Europeans managed to conquer America and gain supremacy at sea mainly because the Asiatic powers showed little interest in them. The early modern era was a golden age for the Ottoman Empire in the Mediterranean, the Safavid Empire in Persia, the Mughal Empire in India, and the Chinese Ming and Qing dynasties. They expanded their territories significantly and enjoyed unprecedented demographic and economic growth. In 1775 Asia accounted for 80 per cent of the world economy. The combined economies of India and

China alone represented two-thirds of global production. In comparison, Europe was an economic dwarf.³

有一件歷史上最奇怪的事情，就是來自北大西洋的大島的人們征服了澳洲南部的另一個大島。在庫克遠征之前不久，英國群島和整個西歐都是地中海世界的遙遠邊陲。那裡幾乎沒有任何重要事件發生。即使羅馬帝國 - 唯一一個重要的前現代歐洲帝國 - 多數財富也來自其北非、巴爾幹和中東省份。羅馬的西歐省份是一個窮困的野西部，除了礦物和奴隸之外幾乎沒有貢獻。北歐是如此荒涼和野蠻，甚至不值得征服。35. Truganini，最後的塔斯曼尼亞土著人。直到15世紀末，歐洲才成為重要的軍事、政治、經濟和文化發展的溫床。在1500年至1750年間，西歐逐漸壯大，成為“外部世界”的主宰，指的是兩個美洲大陸和海洋。然而，即使那時，歐洲也不是亞洲強國的對手。歐洲人之所以能征服美洲並在海上取得霸權，主要是因為亞洲大國對他們不感興趣。近現代時期是奧斯曼帝國、波斯薩非王朝、印度莫卧儒帝國和中國明清王朝的黃金時期。他們大大擴展了自己的領土，並享受了前所未有的人口和經濟增長。1775年，亞洲佔全球經濟的80%。印度和中國的經濟總量就佔全球產值的三分之二。相比之下，歐洲是一個經濟矮小的大陸。

The global centre of power shifted to Europe only between 1750 and 1850, when Europeans humiliated the Asian powers in a series of wars and conquered large parts of Asia. By 1900 Europeans firmly controlled the world's economy and most of its territory. In 1950 western Europe and the United States together accounted for more than half of global production, whereas China's portion had been reduced to 5 per cent.⁴ Under the European aegis a new global order and global culture emerged. Today all humans are, to a much greater extent than they usually want to admit, European in dress, thought and taste. They may be fiercely anti-European in their rhetoric, but almost everyone on the planet views politics, medicine, war and economics through European eyes, and listens to music written in European modes with words in European languages. Even today's burgeoning Chinese economy, which may soon regain its global primacy, is built on a European model of production and finance.

全球的權力中心僅於1750年至1850年之間轉移到歐洲，當時歐洲人在一系列戰爭中羞辱了亞洲大國並征服了亞洲的大部分地區。到了1900年，歐洲人牢固掌握了世界經濟和大部分領土。1950年時，西歐和美國的總生產量佔全球超過一半，而中國的份額已降至5%。在歐洲的保護下，一個新的全球秩序和全球文化出現了。今天，所有人都比他們通常想承認的更多地穿著歐洲式的裝束，思想和品味。他們可能在言辭上激烈反對歐洲，但幾乎全球所有人都是通過歐洲的眼光來看待政治，醫療，戰爭和經濟，並聆聽用歐洲語言寫成的音樂。即使是今天蓬勃發展的中國經濟，可能很快恢復其全球主宰地位，也是建立在歐洲生產和金融模式的基礎上。

How did the people of this frigid finger of Eurasia manage to break out of their remote corner of the globe and conquer the entire world? Europe's scientists are often given much of the credit. It's unquestionable that from 1850 onward European domination rested to a large extent on the military-industrial-scientific complex and technological wizardry. All successful late modern empires cultivated scientific research in the hope of harvesting technological innovations, and many scientists spent most of their time working on arms, medicines and machines for their imperial masters. A common saying among European soldiers facing African enemies was, 'Come what may, we have machine guns, and they don't.' Civilian technologies were no less important. Canned food fed soldiers, railroads and steamships transported soldiers and their provisions, while a new arsenal of medicines cured soldiers, sailors and locomotive engineers. These logistical advances played a more significant role in the European conquest of Africa than did the machine gun.

這個歐亞寒冷地帶的人民如何成功地突破其偏遠的角落並征服整個世界？歐洲的科學家通常被給予很多信譽。毫無疑問，從1850年開始，歐洲的統治在很大程度上依賴於軍事、工業、科學複合體和技術魔法。所有成功的近現代帝國都培育科學研究，以期獲取技術創新，許多科學家在為其皇家主人研製武器、藥品和機器的大部分時間。歐洲士兵面對非洲敵人時常說，「管它呢，我們有機槍，他們沒有。」民間技術同樣重要。罐頭食品給士兵提供營養，鐵路和蒸汽船運輸士兵和他們的物資，而新的藥物庫則治癒了士兵、水手和火車司機。這些物流進步在歐洲征服非洲方面扮演了更重要的角色，比機槍更重要。

But that wasn't the case before 1850. The military-industrial-scientific complex was still in its infancy; the technological fruits of the Scientific Revolution were unripe; and the technological gap between European, Asiatic and African powers was small. In 1770, James Cook certainly had far better technology than the Australian Aborigines, but so did the Chinese and the Ottomans. Why then was Australia explored and colonised by Captain James Cook and not by Captain Wan Zhengse or Captain Hussein Pasha? More importantly, if in 1770 Europeans had no significant technological advantage over Muslims, Indians and Chinese, how did they manage in the following century to open such a gap between themselves and the rest of the world?

Why did the military-industrial-scientific complex blossom in Europe rather than India? When Britain leaped forward, why were France, Germany and the United States quick to follow, whereas China lagged behind? When the gap between industrial and non-industrial nations became an obvious economic and political factor, why did Russia, Italy and Austria succeed in closing it, whereas Persia, Egypt and the Ottoman Empire failed? After all, the technology of the first industrial wave was relatively simple. Was it so hard for Chinese or Ottomans to engineer steam engines, manufacture machine guns and lay down railroads?

但在1850年之前，情况并非如此。军事-工业-科学复合体仍处于起步阶段；科学革命的技术成果还未成熟；欧洲、亚洲和非洲国家之间的技术差距很小。1770年，詹姆斯·库克（James Cook）当然拥有比澳大利亚原住民更好的技术，但中国和奥斯曼帝国也是如此。那么为什么澳大利亚被詹姆斯·库克船长探索和殖民，而不是万正色船长或侯赛因帕夏船长呢？更重要的是，如果在1770年，欧洲人与穆斯林、印度人和中国人没有显着的技术优势，那么他们在接下来的一个世纪是如何成功地在自己和世界其他地区之间开创出如此差距的呢？为什么军事-工业-科学复合体在欧洲蓬勃发展，而不是在印度？当英国腾飞时，为什么法国、德国和美国也紧随其后，而中国却落后了？当工业和非工业国家之间的差距成为明显的经济和政治因素时，为什么俄罗斯、意大利和奥地利能够成功地弥合这一差距，而波斯、埃及和奥斯曼帝国却失败了呢？毕竟，第一波工业技术相对简单。中国或奥斯曼人制造蒸汽机、机枪和铺设铁路是如此困难吗？

The world's first commercial railroad opened for business in 1830, in Britain. By 1850, Western nations were criss-crossed by almost 40,000 kilometres of railroads – but in the whole of Asia, Africa and Latin America there were only 4,000 kilometres of tracks. In 1880, the West boasted more than 350,000 kilometres of railroads, whereas in the rest of the world there were but 35,000 kilometres of train lines (and most of these were laid by the British in India). ⁵ The first railroad in China opened only in 1876. It was twenty-five kilometres long and built by Europeans – the Chinese government destroyed it the following year. In 1880 the Chinese Empire did not operate a single railroad. The first railroad in Persia was built only in 1888, and it connected Tehran with a Muslim holy site about ten kilometres south of the capital. It was constructed and operated by a Belgian company. In 1950, the total railway network of Persia still amounted to a meagre 2,500 kilometres, in a country seven times the size of Britain. ⁶

世界上第一條商業鐵路於1830年在英國開通。到1850年，西方國家有著接近4萬公里的鐵路網，但在整個亞洲、非洲和拉丁美洲地區，只有4,000公里的鐵路線。到1880年，西方國家鐵路線超過35萬公里，而世界上其他地方只有3.5萬公里的鐵路線（其中大部分由英國在印度建造）。中國第一條鐵路於1876年開通，全長25公里，由歐洲人建造 - 中國政府於次年摧毀了它。1880年，中國帝國還沒有運營一條鐵路。波斯的第一條鐵路是在1888年建成，它連接德黑蘭和首都南部約10公里處的一個穆斯林聖地。它是由一家比利時公司建造和運營的。到1950年，波斯鐵路網總長度僅有2,500公里，在一個比英國大七倍的國家中。

The Chinese and Persians did not lack technological inventions such as steam engines (which could be freely copied or bought). They lacked the values, myths, judicial apparatus and sociopolitical structures that took centuries to form and mature in the West and which could not be copied and internalised rapidly. France and the United States quickly followed in Britain's footsteps because the French and Americans already shared the most important British myths and social structures. The Chinese and Persians could not catch up as quickly because they thought and organised their societies differently.

This explanation sheds new light on the period from 1500 to 1850. During this era Europe did not enjoy any obvious technological, political, military or

economic advantage over the Asian powers, yet the continent built up a unique potential, whose importance suddenly became obvious around 1850. The apparent equality between Europe, China and the Muslim world in 1750 was a mirage. Imagine two builders, each busy constructing very tall towers. One builder uses wood and mud bricks, whereas the other uses steel and concrete. At first it seems that there is not much of a difference between the two methods, since both towers grow at a similar pace and reach a similar height. However, once a critical threshold is crossed, the wood and mud tower cannot stand the strain and collapses, whereas the steel and concrete tower grows storey by storey, as far as the eye can see.

中國和波斯缺乏的不是技術發明，例如蒸汽機（這些發明可以自由複製或購買）。他們缺乏的是在西方花費幾個世紀形成和成熟的價值觀、神話、司法體系和社會政治結構，這些無法快速複製和內化。法國和美國很快跟隨英國的步伐，因為法國人和美國人已經分享了最重要的英國神話和社會結構。中國人和波斯人無法像西方國家那樣快速追上，因為他們的思維方式和社會組織不同。這一解釋為1500年至1850年的時期帶來了新的解釋。在這個時代，歐洲沒有任何明顯的技術、政治、軍事或經濟優勢，然而這片大陸建立了一種獨特的潛力，其重要性在1850年左右突然變得明顯。1750年歐洲、中國和穆斯林世界之間的表面平等是一個幻象。想象兩個建築商，每個人都在建造非常高的塔樓。一個建造者使用木材和泥磚，而另一個建造者使用鋼筋混凝土。起初，這兩種方法之間似乎沒有太大的區別，因為兩座塔樓的增長速度和高度相似。然而，一旦跨越關鍵閾值，泥磚塔就無法承受壓力而倒塌，而鋼筋混凝土塔樓逐層生長，可以看到很遠的地方。

What potential did Europe develop in the early modern period that enabled it to dominate the late modern world? There are two complementary answers to this question: modern science and capitalism. Europeans were used to thinking and behaving in a scientific and capitalist way even before they enjoyed any significant technological advantages. When the technological bonanza began, Europeans could harness it far better than anybody else. So it is hardly coincidental that science and capitalism form the most important legacy that European imperialism has bequeathed the post-European world of the twenty-first century. Europe and Europeans no longer rule the world, but science and capital are growing ever stronger. The victories of

capitalism are examined in the following chapter. This chapter is dedicated to the love story between European imperialism and modern science.

歐洲在近代時期發展出哪些潛力，讓它能夠主宰現代世界？對於這個問題有兩個互補的答案：現代科學和資本主義。歐洲人在享有任何顯著的技術優勢之前，就已經習慣以科學和資本主義方式思考和行動。當技術繁榮時代到來，歐洲人比其他人能更好地利用它。因此，科學和資本主義是歐洲帝國主義所傳承給21世紀世界的最重要的遺產。歐洲和歐洲人不再統治世界，但科學和資本繼續壯大。本章探討資本主義的勝利。而本章則專門探討歐洲帝國主義和現代科學之間的愛情故事。

The Mentality of Conquest

Modern science flourished in and thanks to European empires. The discipline obviously owes a huge debt to ancient scientific traditions, such as those of classical Greece, China, India and Islam, yet its unique character began to take shape only in the early modern period, hand in hand with the imperial expansion of Spain, Portugal, Britain, France, Russia and the Netherlands. During the early modern period, Chinese, Indians, Muslims, Native Americans and Polynesians continued to make important contributions to the Scientific Revolution. The insights of Muslim economists were studied by Adam Smith and Karl Marx, treatments pioneered by Native American doctors found their way into English medical texts and data extracted from Polynesian informants revolutionised Western anthropology. But until the mid-twentieth century, the people who collated these myriad scientific discoveries, creating scientific disciplines in the process, were the ruling and intellectual elites of the global European empires. The Far East and the Islamic world produced minds as intelligent and curious as those of Europe. However, between 1500 and 1950 they did not produce anything that comes even close to Newtonian physics or Darwinian biology.

現代科學蓬勃發展得益於歐洲帝國。這門學科明顯地對古代科學傳統，例如古希臘、中國、印度和伊斯蘭等傳統，有著巨大的債務，然而其獨特性只在早期現代時期開始形成，並且與西班牙、葡萄牙、英國、法國、俄羅斯和荷蘭的帝國擴張並行不據。在早期現代時期，中

國人、印度人、穆斯林、原住民和波利尼西亞人仍然為科學革命做出了重要貢獻。穆斯林經濟學家的見解被亞當·斯密和卡爾·馬克思研究，由原住民醫生開創的治療方法也進入了英國的醫療文獻，從波利尼西亞人的信息中提取的數據也徹底改變了西方人類學的模式。但直到二十世紀中葉，編纂這些各種科學發現、並在此過程中創造科學學科的人，仍然是全球歐洲帝國統治和知識精英。東方和伊斯蘭世界的人智力和好奇心與歐洲人一樣出色，但在1500至1950年期間，他們並沒有製作出任何與牛頓物理學或達爾文生物學相媲美的成果。

This does not mean that Europeans have a unique gene for science, or that they will forever dominate the study of physics and biology. Just as Islam began as an Arab monopoly but was subsequently taken over by Turks and Persians, so modern science began as a European speciality, but is today becoming a multi-ethnic enterprise.

What forged the historical bond between modern science and European imperialism? Technology was an important factor in the nineteenth and twentieth centuries, but in the early modern era it was of limited importance. The key factor was that the plant-seeking botanist and the colony-seeking naval officer shared a similar mindset. Both scientist and conqueror began by admitting ignorance – they both said, ‘I don’t know what’s out there.’ They both felt compelled to go out and make new discoveries. And they both hoped the new knowledge thus acquired would make them masters of the world.

這並不意味著歐洲人擁有獨特的科學基因，或者他們將永遠主宰物理和生物學的研究。正如伊斯蘭教最初是阿拉伯的專利，但之後被土耳其人和波斯人接管，現代科學也是起源於歐洲的專業領域，但今天已成為多種族的企業。造就現代科學和歐洲帝國主義之間的歷史聯繫的是什麼？技術在19世紀和20世紀是一個重要因素，但在早期現代時代，這一因素的重要性有限。關鍵因素是尋求植物的植物學家和殖民地尋求的海軍軍官具有相似的心態。科學家和征服者都從承認無知開始 - 他們都說：“我不知道那裡有什麼。”他們都感到有必要出去創造新的發現。他們都希望這樣獲得的新知識會使他們成為世界的主宰。

European imperialism was entirely unlike all other imperial projects in history. Previous seekers of empire tended to assume that they already

understood the world. Conquest merely utilised and spread *their* view of the world. The Arabs, to name one example, did not conquer Egypt, Spain or India in order to discover something they did not know. The Romans, Mongols and Aztecs voraciously conquered new lands in search of power and wealth – not of knowledge. In contrast, European imperialists set out to distant shores in the hope of obtaining new knowledge along with new territories.

James Cook was not the first explorer to think this way. The Portuguese and Spanish voyagers of the fifteenth and sixteenth centuries already did. Prince Henry the Navigator and Vasco da Gama explored the coasts of Africa and, while doing so, seized control of islands and harbours. Christopher Columbus ‘discovered’ America and immediately claimed sovereignty over the new lands for the kings of Spain. Ferdinand Magellan found a way around the world, and simultaneously laid the foundation for the Spanish conquest of the Philippines.

歐洲帝國主義是所有歷史上的帝國計劃中完全不同的。過去的帝國探險家往往假定自己已經了解了世界。征服只是利用和傳播他們對世界的看法。阿拉伯人，以埃及、西班牙和印度為例，並不是為了發現他們不知道的東西而征服的。羅馬人、蒙古人和阿茲特克人貪婪地征服新土地，是為了追求權力和財富，而非知識。相比之下，歐洲帝國主義者為了獲得新領土，也前往遙遠的海岸以獲取新知識。詹姆斯·庫克不是第一個這樣想的探險家。15和16世紀的葡萄牙和西班牙航海家已經這樣做了。亨利王子和瓦斯科·達伽馬探索了非洲海岸，並在此過程中控制了島嶼和港口。克里斯托弗·哥倫布“發現”了美洲，並立即為西班牙國王宣佈對新土地的主權。費爾南多·麥哲倫找到了環遊世界的方法，同時為西班牙征服菲律賓奠定了基礎。

As time went by, the conquest of knowledge and the conquest of territory became ever more tightly intertwined. In the eighteenth and nineteenth centuries, almost every important military expedition that left Europe for distant lands had on board scientists who set out not to fight but to make scientific discoveries. When Napoleon invaded Egypt in 1798, he took 165 scholars with him. Among other things, they founded an entirely new discipline, Egyptology, and made important contributions to the study of religion, linguistics and botany.

In 1831, the Royal Navy sent the ship HMS *Beagle* to map the coasts of South America, the Falklands Islands and the Galapagos Islands. The navy needed this knowledge in order to be better prepared in the event of war. The ship's captain, who was an amateur scientist, decided to add a geologist to the expedition to study geological formations they might encounter on the way. After several professional geologists refused his invitation, the captain offered the job to a twenty-two-year-old Cambridge graduate, Charles Darwin. Darwin had studied to become an Anglican parson but was far more interested in geology and natural sciences than in the Bible. He jumped at the opportunity, and the rest is history. The captain spent his time on the voyage drawing military maps while Darwin collected the empirical data and formulated the insights that would eventually become the theory of evolution.

隨著時間的推移，知識與領土的征服變得越來越緊密地交織在一起。在十八和十九世紀，幾乎所有對遠方的重要軍事遠征都有科學家隨行，他們的目的不是為了戰鬥，而是為了進行科學發現。1798年拿破崙入侵埃及時，他帶了165位學者。除了其他任務外，他們還創建了完全全新的學科埃及學，並對宗教、語言學和植物學的研究做出了重要貢獻。1831年，英國皇家海軍派出HMS *Beagle*號船航行南美洲、福克蘭群島和加拉帕戈斯群島沿岸的海域，以製作更好的戰爭地圖。由於遠征隊中需要地質學家，該艦隊的船長是一位業餘科學家，他在一些專業地質學家拒絕接受邀請後，將工作機會提供給了一位22歲的劍橋大學畢業生查爾斯·達爾文。達爾文原本學習神職人員，但他對地質和自然科學的興趣遠大於聖經。他非常樂意接受這個機會，其餘的事情就成為了歷史。船長在航行期間利用時間繪制軍事地圖，而達爾文則收集實證數據和推理出後來成為進化論的見解。

On 20 July 1969, Neil Armstrong and Buzz Aldrin landed on the surface of the moon. In the months leading up to their expedition, the *Apollo 11* astronauts trained in a remote moon-like desert in the western United States. The area is home to several Native American communities, and there is a story – or legend – describing an encounter between the astronauts and one of the locals.

One day as they were training, the astronauts came across an old Native American. The man asked them what they were doing there. They replied that they were part of a research expedition that would shortly travel to explore

the moon. When the old man heard that, he fell silent for a few moments, and then asked the astronauts if they could do him a favour.

‘What do you want?’ they asked.

1969年7月20日，尼爾·阿姆斯壯和巴茲·奧爾德林登陸月球表面。在遠征前的幾個月裡，阿波羅11號宇航員在美國西部的一個偏遠的類似月球的沙漠中進行了訓練。該地區是幾個美洲原住民社區的所在地，有一個故事或傳說，描述了宇航員和當地人之間的一次相遇。一天，當他們訓練時，宇航員遇到一位老美洲原住民。這個人問他們在那裡做什麼。他們回答說，他們是一個研究遠征的一部分，將很快前往探索月球。當老人聽到這個消息時，他沉默了片刻，然後問宇航員是否能幫助他一個忙。「你想要什麼？」他們問他。

‘Well,’ said the old man, ‘the people of my tribe believe that holy spirits live on the moon. I was wondering if you could pass an important message to them from my people.’

‘What’s the message?’ asked the astronauts.

The man uttered something in his tribal language, and then asked the astronauts to repeat it again and again until they had memorised it correctly.

‘What does it mean?’ asked the astronauts.

‘Oh, I cannot tell you. It’s a secret that only our tribe and the moon spirits are allowed to know.’

When they returned to their base, the astronauts searched and searched until they found someone who could speak the tribal language, and asked him to translate the secret message. When they repeated what they had memorised, the translator started to laugh uproariously. When he calmed down, the astronauts asked him what it meant. The man explained that the sentence they had memorised so carefully said, ‘Don’t believe a single word these people are telling you. They have come to steal your lands.’

「嗯，」老人說：「我們部落的人相信神靈居住在月亮上。我想知道你們能否傳達一個重要訊息給他們，來自我的族人。」「是什麼訊

息？」宇航員問道。老人用部落語言說了些話，然後要求宇航員一遍又一遍地重複，直到他們正確地記住了。「這是什麼意思？」宇航員問道。「哦，我不能告訴你們。這是只有我們部落和月亮精靈才能知道的秘密。」當他們回到基地時，宇航員搜索了很久，終於找到了一位會說部落語言的人，並請他翻譯這個秘密訊息。當他們重複他們已經記住的話時，翻譯員開始大笑。當他冷靜下來時，宇航員問他意思是什麼。這個人解釋說，他們仔細記下的那個句子說，「不要相信這些人說的任何話。他們來這裡是要偷走你們的土地。」

Empty Maps

The modern ‘explore and conquer’ mentality is nicely illustrated by the development of world maps. Many cultures drew world maps long before the modern age. Obviously, none of them really knew the whole of the world. No Afro-Asian culture knew about America, and no American culture knew about Afro-Asia. But unfamiliar areas were simply left out, or filled with imaginary monsters and wonders. These maps had no empty spaces. They gave the impression of a familiarity with the entire world.

During the fifteenth and sixteenth centuries, Europeans began to draw world maps with lots of empty spaces – one indication of the development of the scientific mindset, as well as of the European imperial drive. The empty maps were a psychological and ideological breakthrough, a clear admission that Europeans were ignorant of large parts of the world.

現代的「探索和征服」心態通過世界地圖的發展得到了很好的體現。在現代之前，許多文化就已經繪製了世界地圖。顯然，這些文化都不曾真正了解整個世界。沒有一個非洲或亞洲的文化知道美洲，也沒有一個美洲的文化知道非洲或亞洲。但是，對於陌生的地區，它們簡單地遺漏了，或者填滿了想像中的怪物和奇觀。這些地圖沒有空白的區域。它們給人一種對整個世界的熟悉感。在15和16世紀，歐洲人開始繪製有很多空白區域的世界地圖，這是科學心態和歐洲帝國主義驅動力發展的一個標誌。空白地圖是一個心理和意識形態上的突破，清楚地承認歐洲人對世界的大部分地區一無所知。

The crucial turning point came in 1492, when Christopher Columbus sailed westward from Spain, seeking a new route to East Asia. Columbus still believed in the old ‘complete’ world maps. Using them, Columbus calculated that Japan should have been located about 7,000 kilometres west of Spain. In fact, more than 20,000 kilometres and an entire unknown continent separate East Asia from Spain. On 12 October 1492, at about 2:00 a.m., Columbus’ expedition collided with the unknown continent. Juan Rodriguez Bermejo, watching from the mast of the ship *Pinta*, spotted an island in what we now call the Bahamas, and shouted ‘Land! Land!’

Columbus believed he had reached a small island off the East Asian coast. He called the people he found there ‘Indians’ because he thought he had landed in the Indies – what we now call the East Indies or the Indonesian archipelago. Columbus stuck to this error for the rest of his life. The idea that he had discovered a completely unknown continent was inconceivable for him and for many of his generation. For thousands of years, not only the greatest thinkers and scholars but also the infallible Scriptures had known only Europe, Africa and Asia. Could they all have been wrong? Could the Bible have missed half the world? It would be as if in 1969, on its way to the moon, *Apollo 11* had crashed into a hitherto unknown moon circling the earth, which all previous observations had somehow failed to spot. In his refusal to admit ignorance, Columbus was still a medieval man. He was convinced he knew the whole world, and even his momentous discovery failed to convince him otherwise.

關鍵轉捩點出現於1492年，當時克里斯托弗·哥倫布從西班牙啟程向西航行，尋找通往東亞的新路線。哥倫布仍相信舊的“完整”地圖。他計算出，日本應該位於西班牙以西約7,000公里處。實際上，東亞和西班牙之間隔著超過20,000公里和整個未知大陸。1492年10月12日凌晨2點左右，哥倫布的遠征隊撞上了未知大陸。胡安·羅德里格斯·貝梅霍站在皮塔號的桅杆上觀察到了現在所稱的巴哈馬島，大喊“陸地！陸地！”哥倫布相信他到達了東亞海岸的一個小島。他稱那裡的居民為“印第安人”，因為他認為自己已經登陸在印度群島（現在又稱為東印度群島或印尼群島）。哥倫布終身堅持這個錯誤。他和他那一代人認為發現一個完全未知的大陸是不可思議的。數千年來，不僅是最偉大的思想家和學者，而且聖經也無所不知，只知道歐洲、非洲和亞洲。他們都可能錯了嗎？聖經可能錯過了半個世界嗎？就好像在1969

年，阿波羅11號在前往月球的途中撞上了一個以前從未發現的環繞地球運行的月球，而所有以前的觀測都以某種方式失敗了一樣。哥倫布拒絕承認無知，他仍然是一個中世紀的人。他相信自己瞭解整個世界，即使他重要的發現未能使他改變看法。



36. A European world map from 1459 (Europe is in the top left corner). The map is filled with details, even when depicting areas that were completely unfamiliar to Europeans, such as southern Africa .

The first modern man was Amerigo Vespucci, an Italian sailor who took part in several expeditions to America in the years 1499–1504. Between 1502 and 1504, two texts describing these expeditions were published in Europe. They were attributed to Vespucci. These texts argued that the new lands discovered by Columbus were not islands off the East Asian coast, but rather

an entire continent unknown to the Scriptures, classical geographers and contemporary Europeans. In 1507, convinced by these arguments, a respected mapmaker named Martin Waldseemüller published an updated world map, the first to show the place where Europe's westward-sailing fleets had landed as a separate continent. Having drawn it, Waldseemüller had to give it a name. Erroneously believing that Amerigo Vespucci had been the person who discovered it, Waldseemüller named the continent in his honour – America. The Waldseemüller map became very popular and was copied by many other cartographers, spreading the name he had given the new land. There is poetic justice in the fact that a quarter of the world, and two of its seven continents, are named after a little-known Italian whose sole claim to fame is that he had the courage to say, 'We don't know.'

36.1459年一张欧洲世界地图（欧洲位于左上方）。即使在描绘欧洲人完全陌生的地区（如南非），该地图也充满了细节。第一个现代人是阿美利哥·维斯普奇（Amerigo Vespucci），一名参与了1499-1504年间多次前往美洲的意大利水手。在1502年至1504年间，两篇描述这些探险的文本被发表在欧洲。它们被归属于维斯普奇。这些文本认为哥伦布发现的新土地不是东亚海岸的岛屿，而是一整块未知于经文、古典地理学家和当代欧洲人的大陆。在受到这些观点的影响后，一位受人尊敬的地图制作者马丁·瓦尔德西米勒在1507年发表了一幅更新的世界地图，第一次将欧洲西航的舰队登陆的地点作为一个独立的大陆展示。在画完之后，瓦尔德西米勒不得不给它取一个名字。由于错误地认为阿美利哥·维斯普奇是发现它的人，瓦尔德西米勒以他的名字命名了这个大陆——美洲。瓦尔德西米勒地图变得非常流行，并被许多其他制图师复制，传播他所取的这个新土地的名称。有诗意的正义在于，世界的四分之一，以及其中的七个大陆中的两个，都是以一个鲜为人知的意大利人的名字命名的，他唯一的荣誉是勇敢地说：“我们不知道。”

The discovery of America was the foundational event of the Scientific Revolution. It not only taught Europeans to favour present observations over past traditions, but the desire to conquer America also obliged Europeans to search for new knowledge at breakneck speed. If they really wanted to control the vast new territories, they had to gather enormous amounts of new data about the geography, climate, flora, fauna, languages, cultures and

history of the new continent. Christian Scriptures, old geography books and ancient oral traditions were of little help.

Henceforth not only European geographers, but European scholars in almost all other fields of knowledge began to draw maps with spaces left to fill in. They began to admit that their theories were not perfect and that there were important things that they did not know.

美洲的發現是科學革命的基礎事件，不僅教導歐洲人重視當前觀察而非過去傳統，征服美洲的意願還迫使歐洲人以驚人的速度尋求新知識。如果他們真的想控制這些廣闊的新領土，就必須收集大量關於新大陸地理、氣候、植物、動物、語言、文化和歷史的新資料。基督教經文、舊地理書和古老的口傳傳統沒有多大幫助。此後，不僅歐洲地理學者，幾乎所有其他知識領域的歐洲學者開始繪製留有空白的地圖。他們開始承認自己的理論不完美，並且有重要的事情他們不知道。

The Europeans were drawn to the blank spots on the map as if they were magnets, and promptly started filling them in. During the fifteenth and sixteenth centuries, European expeditions circumnavigated Africa, explored America, crossed the Pacific and Indian Oceans, and created a network of bases and colonies all over the world. They established the first truly global empires and knitted together the first global trade network. The European imperial expeditions transformed the history of the world: from being a series of histories of isolated peoples and cultures, it became the history of a single integrated human society.



37. The Salviati World Map, 1525. While the 1459 world map is full of continents, islands and detailed explanations, the Salviati map is mostly empty. The eye wanders south along the American coastline, until it peters into emptiness. Anyone looking at the map and possessing even minimal curiosity is tempted to ask, 'What's beyond this point?' The map gives no answers. It invites the observer to set sail and find out .

歐洲人像磁鐵一樣吸引著地圖上的空白點，立即開始填補。在15和16世紀期間，歐洲探險隊環繞非洲，探索美洲，橫越太平洋和印度洋，并在全球各地建立了一個基地和殖民地的網絡。他們建立了第一個真正的全球帝國，編織了第一個全球貿易網絡。歐洲的帝國探險改變了世界的歷史：從一系列孤立的人民和文化的歷史，它成為了一個整體人類社會的歷史。37. 萨尔维亚蒂世界地图，1525年。而1459年世界地图充满了大陆，岛屿和详细的解释，萨尔维亚蒂地图则基本上是空的。眼睛沿著美洲海岸线向南漫游，直到消失在虚無中。任何看地圖并且具有最少的好奇心的人都会想问，“在这个点之后会发生什 么？”地图没有给出答案。它邀请观察者出航并去发现。

These European explore-and-conquer expeditions are so familiar to us that we tend to overlook just how extraordinary they were. Nothing like them had ever happened before. Long-distance campaigns of conquest are not a natural undertaking. Throughout history most human societies were so busy with local conflicts and neighbourhood quarrels that they never considered exploring and conquering distant lands. Most great empires extended their

control only over their immediate neighbourhood – they reached far-flung lands simply because their neighbourhood kept expanding. Thus the Romans conquered Etruria in order to defend Rome (c. 350–300 BC). They then conquered the Po Valley in order to defend Etruria (c. 200 BC). They subsequently conquered Provence to defend the Po Valley (c. 120 BC), Gaul to defend Provence (c. 50 BC), and Britain in order to defend Gaul (c. AD 50). It took them 400 years to get from Rome to London. In 350 BC, no Roman would have conceived of sailing directly to Britain and conquering it.

這些歐洲探索與征服的遠征在我們看來如此熟悉，以至於我們往往忽略了它們的非凡之處。征服遠方的長途行程不是一個自然的行為。在歷史上，大多數人類社會都忙於解決當地的衝突和鄰里的爭吵，從未考慮探索和征服遠方的土地。大多數偉大的帝國只控制他們的周圍環境-他們達到遙遠的土地僅僅是因為他們的周圍環境不斷擴張。因此，羅馬人征服艾特魯里亞，以保衛羅馬（公元前350-300年）。他們然後征服波河谷，以保衛艾特魯里亞（公元前200年）。隨後，他們征服了普羅旺斯以保衛波河谷（公元前120年），征服高盧以保衛普羅旺斯（公元前50年），並征服不列顛島以保衛高盧（公元50年左右）。他們用了400年的時間從羅馬到倫敦。在公元前350年，沒有一個羅馬人會想到直接航行到不列顛並征服它。

Occasionally an ambitious ruler or adventurer would embark on a long-range campaign of conquest, but such campaigns usually followed well-beaten imperial or commercial paths. The campaigns of Alexander the Great, for example, did not result in the establishment of a new empire, but rather in the usurpation of an existing empire – that of the Persians. The closest precedents to the modern European empires were the ancient naval empires of Athens and Carthage, and the medieval naval empire of Majapahit, which held sway over much of Indonesia in the fourteenth century. Yet even these empires rarely ventured into unknown seas – their naval exploits were local undertakings when compared to the global ventures of the modern Europeans.

Many scholars argue that the voyages of Admiral Zheng He of the Chinese Ming dynasty heralded and eclipsed the European voyages of discovery. Between 1405 and 1433, Zheng led seven huge armadas from China to the far reaches of the Indian Ocean. The largest of these comprised almost 300 ships and carried close to 30,000 people. ⁷ They visited Indonesia, Sri Lanka,

India, the Persian Gulf, the Red Sea and East Africa. Chinese ships anchored in Jeddah, the main harbour of the Hejaz, and in Malindi, on the Kenyan coast. Columbus' fleet of 1492 – which consisted of three small ships manned by 120 sailors – was like a trio of mosquitoes compared to Zheng He's drove of dragons.⁸

偶爾會有雄心勃勃的統治者或冒險家展開遠征征服，但這樣的遠征通常會遵循老套的帝國或商業路線。例如，亞歷山大大帝的遠征並沒有建立一個新的帝國，而是篡奪了現有的波斯帝國。現代歐洲帝國最接近的先例是古代的雅典和迦太基的海上帝國，以及十四世紀統治印尼大部分地區的馬查帕帝國的海上帝國。然而，即使是這些帝國也很少冒險進入未知的海域 - 與現代歐洲人的全球冒險相比，他們的海上探險是地方性的。許多學者認為，明代的鄭和將軍的航行預示並超越了歐洲的發現航行。在1405年至1433年期間，鄭和將軍領導了七次龐大的船隊從中國前往印度洋的遠方。其中最大的一支船隊由近300艘船隻組成，載有近3萬人。他們訪問了印度尼西亞、斯里蘭卡、印度、波斯灣、紅海和東非。中國船隊停泊在海峽地帶的主要港口耶達，以及肯尼亞海岸的馬林迪。哥倫布1492年的船隊 - 包括由120名水手操縱的三艘小船 - 對比鄭和將軍的龍車大軍就像三隻蚊子一樣微不足道。

Yet there was a crucial difference. Zheng He explored the oceans, and assisted pro-Chinese rulers, but he did not try to conquer or colonise the countries he visited. Moreover, the expeditions of Zheng He were not deeply rooted in Chinese politics and culture. When the ruling faction in Beijing changed during the 1430s, the new overlords abruptly terminated the operation. The great fleet was dismantled, crucial technical and geographical knowledge was lost, and no explorer of such stature and means ever set out again from a Chinese port. Chinese rulers in the coming centuries, like most Chinese rulers in previous centuries, restricted their interests and ambitions to the Middle Kingdom's immediate environs.

The Zheng He expeditions prove that Europe did not enjoy an outstanding technological edge. What made Europeans exceptional was their unparalleled and insatiable ambition to explore and conquer. Although they might have had the ability, the Romans never attempted to conquer India or Scandinavia, the Persians never attempted to conquer Madagascar or Spain, and the Chinese never attempted to conquer Indonesia or Africa. Most

Chinese rulers left even nearby Japan to its own devices. There was nothing peculiar about that. The oddity is that early modern Europeans caught a fever that drove them to sail to distant and completely unknown lands full of alien cultures, take one step on to their beaches, and immediately declare, ‘I claim all these territories for my king!’

然而，鄭和的遠航與協助漢人統治者的重要區別在於，他並沒有試圖征服或殖民他造訪的國家。此外，鄭和的遠航並不深深扎根於中國政治和文化之中。在1430年代北京的統治派切換之際，新統治者立刻終止了這項行動。龐大的船隊被拆散，重要的技術和地理知識遺失，而且從中國港口再也沒有一位有如此崇高地位和資源的探險家啟程。未來幾個世紀的中國統治者，就像之前的大多數中國統治者一樣，將興趣和野心限制在中國周圍的環境中。鄭和的遠征證明了歐洲並沒有享有卓越的技術優勢。使歐洲人出眾的是他們無與倫比的探索和征服野心。雖然羅馬人可能有能力，但他們從未試圖征服印度或斯堪的納維亞，波斯人從未試圖征服馬達加斯加或西班牙，中國人從未試圖征服印尼或非洲。大多數中國統治者甚至把附近的日本留給自己去處理。這並不奇怪。奇怪的是，早期的現代歐洲人染上了一種熱病，驅使他們航行到遠方和完全未知的擁有異文化的土地，一踏上海灘，立刻宣布：“我為我的國王宣告了所有這些領土的所有權！”



38. Zheng He's flagship next to that of Columbus .

Invasion from Outer Space

Around 1517, Spanish colonists in the Caribbean islands began to hear vague rumours about a powerful empire somewhere in the centre of the Mexican mainland. A mere four years later, the Aztec capital was a smouldering ruin, the Aztec Empire was a thing of the past, and Hernán Cortés lorded over a vast new Spanish Empire in Mexico.

The Spaniards did not stop to congratulate themselves or even to catch their breath. They immediately commenced explore-and-conquer operations in all directions. The previous rulers of Central America – the Aztecs, the Toltecs, the Maya – barely knew South America existed, and never made any attempt to subjugate it, over the course of 2,000 years. Yet within little more than ten years of the Spanish conquest of Mexico, Francisco Pizarro had discovered the Inca Empire in South America, vanquishing it in 1532.

38. 鄭和的旗艦與哥倫布的旗艦並排而立。大約在1517年，西班牙殖民者在加勒比海的島嶼上開始聽到關於一個強大帝國位於墨西哥本土中心的模糊傳聞。僅僅四年之後，阿茲特克的首都成為了一片燃燒的廢墟，阿茲特克帝國成為了歷史，而埃爾南·科爾特斯統治著一個巨大的新西班牙帝國在墨西哥。西班牙人沒有停下來自我祝賀甚至喘口氣的時間，他們立即開始在各個方向進行探索和征服行動。中美洲以前的統治者 - 阿茲特克人、托爾特克人和瑪雅人 - 幾乎不知道南美洲的存在，而在2000年的歷史長河中從未嘗試征服它。然而，在西班牙征服墨西哥的十年內，弗朗西斯科·皮薩羅在南美洲發現了印加帝國，於1532年征服了它。

Had the Aztecs and Incas shown a bit more interest in the world surrounding them – and had they known what the Spaniards had done to their neighbours – they might have resisted the Spanish conquest more keenly and successfully. In the years separating Columbus' first journey to America (1492) from the landing of Cortés in Mexico (1519), the Spaniards conquered most of the Caribbean islands, setting up a chain of new colonies. For the subjugated natives, these colonies were hell on earth. They were ruled with an iron fist

by greedy and unscrupulous colonists who enslaved them and set them to work in mines and plantations, killing anyone who offered the slightest resistance. Most of the native population soon died, either because of the harsh working conditions or the virulence of the diseases that hitch-hiked to America on the conquerors' sailing ships. Within twenty years, almost the entire native Caribbean population was wiped out. The Spanish colonists began importing African slaves to fill the vacuum.

如果阿茲特克人和印加人對他們周圍的世界多加關注，並且知道西班牙人對他們鄰居所做的事情，他們可能會更熱心和成功地抵制西班牙征服。自哥倫布第一次航行到美洲（1492）至哥爾迪斯在墨西哥登陸（1519）的幾年間，西班牙人征服了大部分加勒比群島，建立了一連串的新殖民地。對於被征服的土著人來說，這些殖民地是地獄般的存在。貪婪和不道德的殖民者用鐵腕統治他們，奴役他們，使他們在礦山和農場工作，殺死任何稍有反抗的人。大部分土著人很快就死亡，要麼是因為嚴酷的工作條件，要麼是因為征服者的帆船上帶來的疾病傳染。在二十年內，幾乎整個加勒比土著人口被消滅。西班牙殖民者開始引進非洲奴隸填補空缺。

This genocide took place on the very doorstep of the Aztec Empire, yet when Cortés landed on the empire's eastern coast, the Aztecs knew nothing about it. The coming of the Spaniards was the equivalent of an alien invasion from outer space. The Aztecs were convinced that they knew the entire world and that they ruled most of it. To them it was unimaginable that outside their domain could exist anything like these Spaniards. When Cortés and his men landed on the sunny beaches of today's Vera Cruz, it was the first time the Aztecs encountered a completely unknown people.

The Aztecs did not know how to react. They had trouble deciding what these strangers were. Unlike all known humans, the aliens had white skins. They also had lots of facial hair. Some had hair the colour of the sun. They stank horribly. (Native hygiene was far better than Spanish hygiene. When the Spaniards first arrived in Mexico, natives bearing incense burners were assigned to accompany them wherever they went. The Spaniards thought it was a mark of divine honour. We know from native sources that they found the newcomers' smell unbearable.)

這次種族滅絕發生在阿茲特克帝國的門口，然而當科爾特斯登陸在帝國東部海岸時，阿茲特克人對此一無所知。西班牙人的到來相當於外星人入侵。阿茲特克人堅信他們了解整個世界，並且統治大部分地區。對他們來說，像這樣的西班牙人存在於他們的領域之外是無法想像的。當科爾特斯和他的人在今天的維拉克魯斯陽光明媚的海灘上登陸時，這是阿茲特克人第一次遇到完全不知名的人。阿茲特克人不知道如何反應。他們很難決定這些陌生人是誰。與所有已知的人不同，這些外星人有著白皮膚。他們還留有許多鬍鬚。有些人的頭髮是太陽的顏色。他們聞起來非常惡臭。（原住民的衛生習慣比西班牙人更好。當西班牙人第一次抵達墨西哥時，原住民們攜帶香爐跟隨他們走到哪裡。西班牙人認為這是神的榮譽標誌。從原住民的資料中，我們知道他們發現新來者的氣味無法忍受。）



Map 7. The Aztec and Inca empires at the time of the Spanish conquest .

The aliens' material culture was even more bewildering. They came in giant ships, the like of which the Aztecs had never imagined, let alone seen. They

rode on the back of huge and terrifying animals, swift as the wind. They could produce lightning and thunder out of shiny metal sticks. They had flashing long swords and impenetrable armour, against which the natives' wooden swords and flint spears were useless.

Some Aztecs thought these must be gods. Others argued that they were demons, or the ghosts of the dead, or powerful sorcerers. Instead of concentrating all available forces and wiping out the Spaniards, the Aztecs deliberated, dawdled and negotiated. They saw no reason to rush. After all, Cortés had no more than 550 Spaniards with him. What could 550 men do to an empire of millions?

地圖7：西班牙征服時期的阿茲特克和印加帝國。外星人的物質文化更加令人困惑。他們乘坐著像阿茲特克人從未想象過、也從未見過的巨大船隻，騎在著像風一樣迅捷的巨大可怕的動物背上。他們能夠用光亮的金屬棒製造閃電和雷聲，揮舞著閃爍著的長劍和刀刃無法貫穿的盔甲，而當地人手中的木劍和燧石槍對他們毫無用處。一些阿茲特克人認為這些外星人一定是神不是人，而其他人則認為他們是魔鬼、亡者的鬼魂或是強大的巫師。阿茲特克人沒有集中所有可用的力量並將西班牙人消滅，而是經過討論、拖延和協商。他們認為沒有必要趕急。畢竟，科爾特斯帶來的西班牙人只有550人，550人能對數百萬人的帝國造成什麼威脅呢？

Cortés was equally ignorant about the Aztecs, but he and his men held significant advantages over their adversaries. While the Aztecs had no experience to prepare them for the arrival of these strange-looking and foul-smelling aliens, the Spaniards knew that the earth was full of unknown human realms, and no one had greater expertise in invading alien lands and dealing with situations about which they were utterly ignorant. For the modern European conqueror, like the modern European scientist, plunging into the unknown was exhilarating.

So when Cortés anchored off that sunny beach in July 1519, he did not hesitate to act. Like a science-fiction alien emerging from his spaceship, he declared to the awestruck locals: 'We come in peace. Take us to your leader.' Cortés explained that he was a peaceful emissary from the great king of Spain, and asked for a diplomatic interview with the Aztec ruler,

Montezuma II. (This was a shameless lie. Cortés led an independent expedition of greedy adventurers. The king of Spain had never heard of Cortés, nor of the Aztecs.) Cortés was given guides, food and some military assistance by local enemies of the Aztecs. He then marched towards the Aztec capital, the great metropolis of Tenochtitlan.

科尔特斯同样对阿兹特克人一无所知，但他和手下拥有极具优势。阿兹特克人从未经历过这些外形奇特、身上有异味的外来者到来的情况，而西班牙人则知道地球上还有未知的人类领域，而且在入侵外来领地并处理完全陌生的情况这方面，他们是最擅长的。对于当代欧洲征服者和科学家而言，冒险进入未知世界是一个使人振奋的过程。1519年7月，科尔特斯在那片阳光普照的海滩停船时，并没有犹豫不决。就像科幻小说中的外星人从飞船中出现一样，他向惊恐的当地居民宣布：“我们是和平使者，请带我们见你们的领袖。”科尔特斯解释说他是西班牙伟大国王的和平使者，并要求与阿兹特克统治者蒙特苏马二世进行外交会谈。（这是一个无耻的谎言，科尔特斯领导了一次由贪婪的冒险家组成的独立探险队，西班牙国王从未听说过科尔特斯，也没有听说过阿兹特克人。）科尔特斯得到了当地敌人的向导、食物和一些军事援助，随即向阿兹特克首都特诺奇蒂特兰进发。

The Aztecs allowed the aliens to march all the way to the capital, then respectfully led the aliens' leader to meet Emperor Montezuma. In the middle of the interview, Cortés gave a signal, and steel-armed Spaniards butchered Montezuma's bodyguards (who were armed only with wooden clubs, and stone blades). The honoured guest took his host prisoner.

Cortés was now in a very delicate situation. He had captured the emperor, but was surrounded by tens of thousands of furious enemy warriors, millions of hostile civilians, and an entire continent about which he knew practically nothing. He had at his disposal only a few hundred Spaniards, and the closest Spanish reinforcements were in Cuba, more than 1,500 kilometres away.

Cortés kept Montezuma captive in the palace, making it look as if the king remained free and in charge and as if the 'Spanish ambassador' were no more than a guest. The Aztec Empire was an extremely centralised polity, and this unprecedented situation paralysed it. Montezuma continued to behave as if he ruled the empire, and the Aztec elite continued to obey him,

which meant they obeyed Cortés. This situation lasted for several months, during which time Cortés interrogated Montezuma and his attendants, trained translators in a variety of local languages, and sent small Spanish expeditions in all directions to become familiar with the Aztec Empire and the various tribes, peoples and cities that it ruled.

阿茲特克人允許外星人一路行進到首都，然後尊敬地帶領外星人的領袖與蒙特祖馬皇帝見面。在訪問中，科爾特斯（Cortés）發出信號，用鋼鐵武裝的西班牙士兵屠殺了蒙特祖馬的侍衛（他們只裝備了木棍和石刀）。尊貴的客人把他的主人拘留了起來。科爾特斯現在處於非常微妙的境地。他已經俘虜了皇帝，但身邊卻有成千上萬的憤怒敵人戰士，數百萬敵對平民，以及他幾乎一無所知的整個大陸。他手頭只有幾百名西班牙人，最近的西班牙援軍位於1500公裡遠的古巴。科爾特斯將蒙特祖馬關押在宮殿裡，讓國王看起來仍然自由而掌管局面，而“西班牙大使”只是一個客人。阿茲特克帝國是一個極度集中的政體，這種前所未有的情況使它陷入了癱瘓。蒙特祖馬繼續表現得像他統治帝國一樣，而阿茲特克精英繼續順從他，這意味著他們順從科爾特斯。這種情況持續了幾個月，在這段時間裡，科爾特斯審問了蒙特祖馬和他的侍從，訓練了可以理解各種當地語言的翻譯員，並向各個方向派遣了小規模的西班牙探險隊，以熟悉阿茲特克帝國及其統治的各個部落、民族和城市。

The Aztec elite eventually revolted against Cortés and Montezuma, elected a new emperor, and drove the Spaniards from Tenochtitlan. However, by now numerous cracks had appeared in the imperial edifice. Cortés used the knowledge he had gained to prise the cracks open wider and split the empire from within. He convinced many of the empire's subject peoples to join him against the ruling Aztec elite. The subject peoples miscalculated badly. They hated the Aztecs, but knew nothing of Spain or the Caribbean genocide. They assumed that with Spanish help they could shake off the Aztec yoke. The idea that the Spanish would take over never occurred to them. They were sure that if Cortés and his few hundred henchmen caused any trouble, they could easily be overwhelmed. The rebellious peoples provided Cortés with an army of tens of thousands of local troops, and with its help Cortés besieged Tenochtitlan and conquered the city.

阿茲特克的精英最終對科爾特斯和蒙特祖馬發動了起義，選出新皇帝，並將西班牙人驅逐出特諾奇提蘭。然而，帝國中已經出現了許多裂痕。科爾特斯利用自己所掌握的知識，將這些裂痕撬開，分裂了帝國。他說服了許多帝國的附庸民族與他聯合起來對抗執政的阿茲特克精英。這些附庸民族犯了嚴重的錯誤。他們憎恨阿茲特克人，但對西班牙或加勒比海的種族滅絕一無所知。他們認為有西班牙人的幫助，他們就能擺脫阿茲特克的枷鎖。他們沒有意識到西班牙人會接管整個帝國。他們相信，如果科爾特斯和他的幾百名手下造成了任何麻煩，他們輕易就可以擊敗他們。造反的附庸民族為科爾特斯提供了成千上萬當地軍隊的軍隊，借助這支軍隊的幫助，科爾特斯包圍並征服了特諾奇提蘭。

At this stage more and more Spanish soldiers and settlers began arriving in Mexico, some from Cuba, others all the way from Spain. When the local peoples realised what was happening, it was too late. Within a century of the landing at Vera Cruz, the native population of the Americas had shrunk by about 90 per cent, due mainly to unfamiliar diseases that reached America with the invaders. The survivors found themselves under the thumb of a greedy and racist regime that was far worse than that of the Aztecs.

Ten years after Cortés landed in Mexico, Pizarro arrived on the shore of the Inca Empire. He had far fewer soldiers than Cortés – his expedition numbered just 168 men! Yet Pizarro benefited from all the knowledge and experience gained in previous invasions. The Inca, in contrast, knew nothing about the fate of the Aztecs. Pizarro plagiarised Cortés. He declared himself a peaceful emissary from the king of Spain, invited the Inca ruler, Atahualpa, to a diplomatic interview, and then kidnapped him. Pizarro proceeded to conquer the paralysed empire with the help of local allies. If the subject peoples of the Inca Empire had known the fate of the inhabitants of Mexico, they would not have thrown in their lot with the invaders. But they did not know.

在這個階段，越來越多的西班牙士兵和殖民者開始從古巴和西班牙遠道而來，前往墨西哥。當當地人意識到發生了什麼事情時，已經太遲了。在維拉克魯斯登陸的一個世紀內，美洲的原住民人口減少了約90%，主要是由於侵略者帶來的陌生疾病所致。倖存者發現自己受到貪婪和種族主義政權的壓制，比阿茲特克人的政權更糟糕。在科爾特

斯登陸墨西哥十年後，皮薩羅抵達印加帝國的海岸。他的士兵比科爾特斯少得多——他的探險隊只有168人！然而，皮薩羅從之前入侵中獲得的所有知識和經驗中受益。相比之下，印加人對阿茲特克人的命運一無所知。皮薩羅抄襲科爾特斯的策略。他宣稱自己是西班牙國王的和平使者，邀請印加統治者阿塔瓦爾帕進行外交會談，然後綁架了他。皮薩羅在當地盟友的幫助下征服了癱瘓的帝國。如果印加帝國的居民知道墨西哥居民的命運，他們就不會與侵略者一起行動。但是他們不知道。

The native peoples of America were not the only ones to pay a heavy price for their parochial outlook. The great empires of Asia – the Ottoman, the Safavid, the Mughal and the Chinese – very quickly heard that the Europeans had discovered something big. Yet they displayed little interest in these discoveries. They continued to believe that the world revolved around Asia, and made no attempt to compete with the Europeans for control of America or of the new ocean lanes in the Atlantic and the Pacific. Even puny European kingdoms such as Scotland and Denmark sent a few explore-and-conquer expeditions to America, but not one expedition of either exploration or conquest was ever sent to America from the Islamic world, India or China. The first non-European power that tried to send a military expedition to America was Japan. That happened in June 1942, when a Japanese expedition conquered Kiska and Attu, two small islands off the Alaskan coast, capturing in the process ten US soldiers and a dog. The Japanese never got any closer to the mainland.

美洲原住民並非唯一因其狹隘的看法而付出高昂代價者。亞洲著名帝國如鄂圖曼帝國、薩非王朝、莫卧儿王朝和中國很快就聽說歐洲人發現了重要事情，但他們不太關心這些發現。他們繼續相信世界以亞洲為中心，並未企圖與歐洲人競爭控制美洲或大西洋和太平洋的新洋路。即使是蘇格蘭和丹麥等微小歐洲王國也派遣了一些探險和征服遠征隊前往美洲，但伊斯蘭世界、印度或中國從未向美洲派遣過任何探險或征服遠征隊。第一個試圖向美洲派遣軍事遠征隊的非歐洲國家是日本。那發生在1942年6月，當時日本遠征隊征服了阿拉斯加海岸線外的兩個小島——基斯卡和阿圖，還捕獲了十名美國士兵和一隻狗。然而，日本人從未靠近過美國本土。

It is hard to argue that the Ottomans or Chinese were too far away, or that they lacked the technological, economic or military wherewithal. The resources that sent Zheng He from China to East Africa in the 1420S should have been enough to reach America. The Chinese just weren't interested. The first Chinese world map to show America was not issued until 1602 – and then by a European missionary!

For 300 years, Europeans enjoyed undisputed mastery in America and Oceania, in the Atlantic and the Pacific. The only significant struggles in those regions were between different European powers. The wealth and resources accumulated by the Europeans eventually enabled them to invade Asia too, defeat its empires, and divide it among themselves. When the Ottomans, Persians, Indians and Chinese woke up and began paying attention, it was too late.

很難說奧斯曼人或中國人距離太遠，或是缺乏技術、經濟或軍事實力。將鄭和從中國送到非洲東部的資源在15世紀初足以到達美洲，但中國人並不感興趣。第一張標示美洲的中國世界地圖是由一位歐洲傳教士於1602年發行的！長達300年，歐洲人在美洲和大洋洲、大西洋和太平洋地區享有無可爭議的主宰地位。那些地區唯一的重大衝突是在不同的歐洲大國之間。歐洲人積累的財富和資源最終讓他們能夠入侵亞洲、擊敗它的帝國並將它瓜分。當奧斯曼人、波斯人、印度人和中國人醒來並開始關注時，已經太晚了。

Only in the twentieth century did non-European cultures adopt a truly global vision. This was one of the crucial factors that led to the collapse of European hegemony. Thus in the Algerian War of Independence (1954–62), Algerian guerrillas defeated a French army with an overwhelming numerical, technological and economic advantage. The Algerians prevailed because they were supported by a global anti-colonial network, and because they worked out how to harness the world's media to their cause – as well as public opinion in France itself. The defeat that little North Vietnam inflicted on the American colossus was based on a similar strategy. These guerrilla forces showed that even superpowers could be defeated if a local struggle became a global cause. It is interesting to contemplate what might have happened had Montezuma been able to manipulate public opinion in Spain

and gain assistance from one of Spain's rivals – Portugal, France or the Ottoman Empire.

20世紀才是非歐洲文化真正採用全球視野的時期。這是導致歐洲霸權崩潰的關鍵因素之一。因此，在阿爾及利亞獨立戰爭（1954-1962）中，阿爾及利亞游擊隊以壓倒性的人數、技術和經濟優勢擊敗了法國軍隊。阿爾及利亞人取得勝利是因為他們得到了全球反殖民主義網絡的支持，並且想出了如何利用世界媒體來支持他們的事業，以及在法國本土引起公眾輿論的支持。小北越對美國巨人的打擊基於類似的策略。這些游擊軍隊表明，即使是超級大國也可以被擊敗，如果一場地方性的鬥爭成為全球性的事業。如果蒙特祖馬能夠操縱西班牙的公眾輿論並獲得西班牙的競爭對手之一-葡萄牙、法國或奧斯曼帝國的協助，這會是一件有趣的事情。

Rare Spiders and Forgotten Scripts

Modern science and modern empires were motivated by the restless feeling that perhaps something important awaited beyond the horizon – something they had better explore and master. Yet the connection between science and empire went much deeper. Not just the motivation, but also the practices of empire-builders were entangled with those of scientists. For modern Europeans, building an empire was a scientific project, while setting up a scientific discipline was an imperial project.

When the Muslims conquered India, they did not bring along archaeologists to systematically study Indian history, anthropologists to study Indian cultures, geologists to study Indian soils, or zoologists to study Indian fauna. When the British conquered India, they did all of these things. On 10 April 1802 the Great Survey of India was launched. It lasted sixty years. With the help of tens of thousands of native labourers, scholars and guides, the British carefully mapped the whole of India, marking borders, measuring distances, and even calculating for the first time the exact height of Mount Everest and the other Himalayan peaks. The British explored the military resources of Indian provinces and the location of their gold mines, but they also took the trouble to collect information about rare Indian spiders, to catalogue

colourful butterflies, to trace the ancient origins of extinct Indian languages, and to dig up forgotten ruins.

現代科學和現代帝國都受到不安的感覺的驅使，或許在地平線的那邊有一些重要的事物在等待他們去探索並征服。然而，科學和帝國之間的聯繫遠不止如此。帝國建立者的實踐與科學家的實踐交織在一起。對於現代歐洲人來說，建立帝國是一個科學項目，而建立科學學科是一個帝國項目。當穆斯林征服印度時，他們沒有帶著考古學家系統地研究印度歷史，人類學家研究印度文化，地質學家研究印度土壤，或動物學家研究印度動物。當英國征服印度時，他們做到了這些事情。1802年4月10日，印度大地測量開始進行。它持續了六十年。在數萬名土著勞工，學者和導遊的幫助下，英國精心繪製了整個印度地圖，標誌邊界，測量距離，甚至計算了聖母峰和其他喜馬拉雅山峰的確切高度。英國人探索了印度各省的軍事資源和金礦的位置，但他們也費心收集有關印度稀有蜘蛛的信息，編目彩色蝴蝶，跟蹤已滅絕印度語言的古代起源，並挖掘被遺忘的廢墟。

Mohenjo-daro was one of the chief cities of the Indus Valley civilisation, which flourished in the third millennium BC and was destroyed around 1900 BC. None of India's pre-British rulers – neither the Mauryas, nor the Guptas, nor the Delhi sultans, nor the great Mughals – had given the ruins a second glance. But a British archaeological survey took notice of the site in 1922. A British team then excavated it, and discovered the first great civilisation of India, which no Indian had been aware of.

Another telling example of British scientific curiosity was the deciphering of cuneiform script. This was the main script used throughout the Middle East for close to 3,000 years, but the last person able to read it probably died sometime in the early first millennium AD. Since then, inhabitants of the region frequently encountered cuneiform inscriptions on monuments, steles, ancient ruins and broken pots. But they had no idea how to read the weird, angular scratches and, as far as we know, they never tried. Cuneiform came to the attention of Europeans in 1618, when the Spanish ambassador in Persia went sightseeing in the ruins of ancient Persepolis, where he saw inscriptions that nobody could explain to him. News of the unknown script spread among European savants and piqued their curiosity. In 1657 European scholars published the first transcription of a cuneiform text from Persepolis. More

and more transcriptions followed, and for close to two centuries scholars in the West tried to decipher them. None succeeded.

摩亨佐达罗是印度河谷文明的主要城市之一，该文明在公元前3千年繁荣，约在公元前1900年被毁。印度在英国统治之前的统治者 - 无论是摩利亚人、吉普塔人、德里苏丹、还是伟大的莫卧儿人 - 都没有重新审视废墟。但是，英国的考古调查在1922年注意到了这个遗址。然后，一支英国小组对其进行了发掘，发现了印度的第一个大型文明，而没有任何印度人知道它的存在。英国科学家好奇心的另一个有力例证是楔形文字的破译。这是中东地区近3,000年来使用的主要文字，但最后一个能够读懂它的人可能在公元一千年左右死亡。此后，该地区的居民经常在纪念碑、碑石、古代遗址和破碗上遇到楔形铭文，但他们不知道如何阅读这些奇怪的角形划痕，并且据我们所知，他们从未尝试过。楔形铭文是在1618年引起欧洲人注意的，当时西班牙驻波斯大使前来参观古代波斯城的废墟，他看到了无人能解释的铭文。未知的文字的消息在欧洲学者中传播，并引起了他们的好奇心。1657年，欧洲学者发表了从波斯城的楔形铭文中转录的第一篇文字。随着越来越多的转录，约有两个世纪的西方学者试图破译这些文字，但没有人成功。

In the 1830s, a British officer named Henry Rawlinson was sent to Persia to help the shah train his army in the European style. In his spare time Rawlinson travelled around Persia and one day he was led by local guides to a cliff in the Zagros Mountains and shown the huge Behistun Inscription. About fifteen metres high and twenty-five metres wide, it had been etched high up on the cliff face on the command of King Darius I sometime around 500 BC. It was written in cuneiform script in three languages: Old Persian, Elamite and Babylonian. The inscription was well known to the local population, but nobody could read it. Rawlinson became convinced that if he could decipher the writing it would enable him and other scholars to read the numerous inscriptions and texts that were at the time being discovered all over the Middle East, opening a door into an ancient and forgotten world.

19世紀30年代，一名名為亨利·羅林森的英國軍官前往波斯，協助國王以歐式方式訓練軍隊。在業餘時間，羅林森在波斯旅行，有一天他被當地嚮導帶到Zagros山脈上的一個懸崖上，並被展示了巨大的Behistun銘文。高約15米，寬約25米，繪制於公元前500年左右大流士一世的命

令下，在懸崖面上刻有楔形文字，用三種語言：古波斯語，伊蘭語和巴比倫語。銘文對當地人民來說是眾所周知的，但沒有人能夠閱讀它。羅林森相信，如果他能破譯這個寫作，它將使他和其他學者能夠閱讀當時正在中東各地發現的眾多銘文和文本，開啟一扇通往古老而被遺忘世界的大門。

The first step in deciphering the lettering was to produce an accurate transcription that could be sent back to Europe. Rawlinson defied death to do so, scaling the steep cliff to copy the strange letters. He hired several locals to help him, most notably a Kurdish boy who climbed to the most inaccessible parts of the cliff in order to copy the upper portion of the inscription. In 1847 the project was completed, and a full and accurate copy was sent to Europe.

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.

解讀文字的第一步是進行精確的轉錄，並將其送回歐洲。Rawlinson冒著生命危險爬上峭壁，複製奇怪的字母，並雇用了幾個當地人幫助他，尤其是一個庫爾德男孩，他攀登到懸崖最不可及的部分，以複製銘文的上部分。1847年項目完成，傳回歐洲了完整且準確的副本。Rawlinson沒有停歇下來。作為一名軍官，他有著軍事和政治使命要履行，但無論何時他有空閒時間，他都在思考著這個神秘文字。他嘗試了一種又一種的方法，最終成功破譯出銘文中的古波斯語部分。這是最容易的，因為古波斯語與現代波斯語沒有太大的區別，而Rawlinson對現代波斯語很熟悉。對古波斯語部分的理解為他提供了了解鎖艾蘭和巴比倫部分秘密所需的關鍵。偉大的大門慢慢打開，一股古老但充滿

生命力的聲音湧出來——蘇美爾市集的喧鬧聲，亞述國王的聲明，巴比倫官僚的辯論。如果沒有像Rawlinson這樣的現代歐洲帝國主義者的努力，我們不會對古代中東帝國的命運有太多了解。

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.

另一位值得注意的帝國主義學者是威廉·瓈斯。瓈斯於1783年9月抵達印度，擔任孟加拉最高法院的法官。他對印度的奇妙之處如此著迷，以至於在抵達不到六個月的時間裡，他就創立了亞洲學會。這個學術組織致力於研究亞洲的文化、歷史和社會，特別是印度的文化、歷史和社會。兩年內，瓈斯就發表了他對梵文語言的觀察，開創了比較語言學的科學。在他的著作中，瓈斯指出了梵文、希臘文和拉丁文之間的驚人相似之處，以及這些語言和哥特語、凱爾特語、古波斯語、德語、法語和英語之間的相似之處。因此，在梵文中，“母親”是“*matar*”，在拉丁文中是“*mater*”，在古凱爾特語中是“*mathir*”。瓈斯推測，所有這些語言必須共享一個共同的起源，從一個現在被遺忘的古老祖先發展而來。他因此成為了最早確定所謂印歐語系的人。

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.

Linguistics received enthusiastic imperial support. The European empires believed that in order to govern effectively they must know the languages and cultures of their subjects. British officers arriving in India were supposed to spend up to three years in a Calcutta college, where they studied Hindu and Muslim law alongside English law; Sanskrit, Urdu and Persian alongside Greek and Latin; and Tamil, Bengali and Hindustani culture alongside mathematics, economics and geography. The study of linguistics provided invaluable help in understanding the structure and grammar of local languages.

瓊斯的研究不僅因為他大膽（且準確）的假設而成為一個重要的里程碑，更因為他發展的有序方法論來比較語言。這被其他學者所採用，讓他們能系統地研究世界上所有語言的發展。語言學得到了熱情的帝國支持。歐洲帝國相信，為了有效地治理，他們必須知道他們的臣民的語言和文化。到印度的英國軍官應該在加爾各答的一所學院學習三年，他們將學習印度教和穆斯林法律以及英國法律；梵文、烏爾都語和波斯語以及希臘語和拉丁語；以及泰米爾語、孟加拉語和印度斯坦文化以及數學、經濟學和地理學。語言學的研究在理解當地語言的結構和語法上提供了無價的幫助。

Thanks to the work of people like William Jones and Henry Rawlinson, the European conquerors knew their empires very well. Far better, indeed, than any previous conquerors, or even than the native population itself. Their superior knowledge had obvious practical advantages. Without such knowledge, it is unlikely that a ridiculously small number of Britons could have succeeded in governing, oppressing and exploiting so many hundreds of millions of Indians for two centuries. Throughout the nineteenth and early twentieth centuries, fewer than 5,000 British officials, about 40,000–70,000 British soldiers, and perhaps another 100,000 British business people, hangers-on, wives and children were sufficient to conquer and rule up to 300 million Indians.⁹

Yet these practical advantages were not the only reason why empires financed the study of linguistics, botany, geography and history. No less

important was the fact that science gave the empires ideological justification. Modern Europeans came to believe that acquiring new knowledge was always good. The fact that the empires produced a constant stream of new knowledge branded them as progressive and positive enterprises. Even today, histories of sciences such as geography, archaeology and botany cannot avoid crediting the European empires, at least indirectly. Histories of botany have little to say about the suffering of the Aboriginal Australians, but they usually find some kind words for James Cook and Joseph Banks.

感謝像威廉·瓊斯和亨利·洛林森這樣的人所做的工作，歐洲征服者對他們的帝國了如指掌。事實上，他們的知識甚至比以前的征服者或本地人更為深入。他們的優越知識具有明顯的實際優勢。沒有這樣的知識，英國人的數量寥寥無幾，可能不可能在兩個世紀內成功地統治、壓迫和剝削數以億計的印度人。在19世紀和20世紀初期，少於5,000名英國官員、約40,000至70,000名英國士兵，以及可能還有另外10萬名英國商人、隨行人員、妻子和孩子足以征服和統治多達3億印度人。然而，這些實際優勢並不是帝國資助語言學、植物學、地理學和歷史研究的唯一原因。同樣重要的是，科學為帝國提供了意識形態上的正當化。現代歐洲人來相信獲得新知識總是好的。事實上，帝國生產出一條不斷流動的新知識，將他們標榜為進步和積極的企業。即使在今天，地理學、考古學和植物學等科學的歷史仍然不能避免間接地歸功於歐洲帝國。植物學的歷史很少提到澳洲原住民的痛苦，但他們通常會對詹姆斯·庫克和約瑟夫·班克斯說些好話。

Furthermore, the new knowledge accumulated by the empires made it possible, at least in theory, to benefit the conquered populations and bring them the benefits of ‘progress’ – to provide them with medicine and education, to build railroads and canals, to ensure justice and prosperity. Imperialists claimed that their empires were not vast enterprises of exploitation but rather altruistic projects conducted for the sake of the non-European races – in Rudyard Kipling’s words, ‘the White Man’s burden’:

Take up the White Man’s burden –

Send forth the best ye breed –

Go bind your sons to exile

To serve your captives' need;
To wait in heavy harness,
On fluttered folk and wild –
Your new-caught, sullen peoples,
Half-devil and half-child.

Of course, the facts often belied this myth. The British conquered Bengal, the richest province of India, in 1764. The new rulers were interested in little except enriching themselves. They adopted a disastrous economic policy that a few years later led to the outbreak of the Great Bengal Famine. It began in 1769, reached catastrophic levels in 1770, and lasted until 1773. About 10 million Bengalis, a third of the province's population, died in the calamity. [10](#)

此外，帝國所累積的新知識，至少從理論上讓他們能夠對被征服的人民造福，並為他們帶來"進步"的好處-提供醫藥和教育、建造鐵路和運河、確保正義和繁榮。帝國主義者聲稱，他們的帝國不是廣泛剝削的企業，而是為了非歐洲種族而進行的利他主義項目-用魯德亞德·吉卜林的話來說，就是"白人的負擔": 承擔白人的負擔 - 派出你最優秀的品種 - 去束縛你的兒子，讓他們流亡去為你的俘虜服務；在厚重的馬具中等待，對待狂風舞動的人們 – 你們捕獲的、陰郁的人民，半魔鬼、半孩子。當然，事實常常證明這個神話是虛假的。英國於1764年征服了印度最富裕的孟加拉邦。新的統治者只對變得富有感興趣。他們採取了一項災難性的經濟政策，幾年後導致了大孟加拉饑荒的爆發。它開始於1769年，到1770年達到災難性的程度，持續到1773年。約有1000萬名孟加拉人，占該省人口的三分之一，在這場災難中死亡。

In truth, neither the narrative of oppression and exploitation nor that of 'The White Man's Burden' completely matches the facts. The European empires did so many different things on such a large scale, that you can find plenty of examples to support whatever you want to say about them. You think that these empires were evil monstrosities that spread death, oppression and injustice around the world? You could easily fill an encyclopedia with their

crimes. You want to argue that they in fact improved the conditions of their subjects with new medicines, better economic conditions and greater security? You could fill another encyclopedia with their achievements. Due to their close cooperation with science, these empires wielded so much power and changed the world to such an extent that perhaps they cannot be simply labelled as good or evil. They created the world as we know it, including the ideologies we use in order to judge them.

事實上，不論是壓迫和剝削的敘述，還是“白人的負擔”的敘述，都不能完全符合事實。歐洲帝國在各個方面所做的事情如此之多，規模也如此之大，你可以找到大量支持你想表達的任何事情的例子。你認為這些帝國是邪惡的怪物，在世界各地傳播死亡、壓迫和不公正？你可以輕鬆地用他們的罪行來填寫一部百科全書。你想爭辯說，實際上他們通過新藥、更好的經濟條件和更大的安全保障改善了子民的情況？你可以用他們的成就來填寫另一部百科全書。由於他們與科學的緊密合作，這些帝國擁有如此之大的力量並改變了世界，以至於也許不能簡單地將其標籤為好或壞。他們創造了我們所知的世界，包括我們用來評判他們的意識形態。

But science was also used by imperialists to more sinister ends. Biologists, anthropologists and even linguists provided scientific proof that Europeans are superior to all other races, and consequently have the right (if not perhaps the duty) to rule over them. After William Jones argued that all Indo-European languages descend from a single ancient language many scholars were eager to discover who the speakers of that language had been. They noticed that the earliest Sanskrit speakers, who had invaded India from Central Asia more than 3,000 years ago, had called themselves Arya. The speakers of the earliest Persian language called themselves Airiia. European scholars consequently surmised that the people who spoke the primordial language that gave birth to both Sanskrit and Persian (as well as to Greek, Latin, Gothic and Celtic) must have called themselves Aryans. Could it be a coincidence that those who founded the magnificent Indian, Persian, Greek and Roman civilisations were all Aryans?

但科學也被帝國主義者用於更陰險的目的。生物學家，人類學家甚至語言學家提供了科學證據，證明歐洲人優於所有其他種族，因此有權利（如果不是義務）統治他們。在威廉·瓊斯（William Jones）爭辯說

所有印歐語言源於一種古老的語言之後，許多學者渴望發現那種語言的說話者是誰。他們注意到，最早的梵語說話者，他們在三千多年前從中亞入侵印度，自稱為阿爾雅（Arya）人。最早的波斯語言說話者自稱為Airia人。歐洲學者因此推測，說出產生梵語和波斯語（以及希臘語，拉丁語，哥德語和凱爾特語）的原始語言的人必須稱自己為雅利安人。那些建立了壯麗的印度，波斯，希臘和羅馬文明的人全都是雅利安人，這可能是一個巧合嗎？

Next, British, French and German scholars wedded the linguistic theory about the industrious Aryans to Darwin's theory of natural selection and posited that the Aryans were not just a linguistic group but a biological entity – a race. And not just any race, but a master race of tall, light-haired, blue-eyed, hard-working, and super-rational humans who emerged from the mists of the north to lay the foundations of culture throughout the world.

Regrettably, the Aryans who invaded India and Persia intermarried with the local natives they found in these lands, losing their light complexions and blond hair, and with them their rationality and diligence. The civilisations of India and Persia consequently declined. In Europe, on the other hand, the Aryans preserved their racial purity. This is why Europeans had managed to conquer the world, and why they were fit to rule it – provided they took precautions not to mix with inferior races.

接著，英國、法國和德國的學者將關於勤奮雅利安語言理論與達爾文的自然選擇理論結合，並提出雅利安人不僅是一個語言群體，而是一個生物實體 - 一個種族。而且不只是一个種族，而是由高大、淺色頭髮、藍色眼睛、勤勞和超級理性的人類構成的優等種族，他們從北方的迷霧中浮現，為整個世界的文化奠定基礎。可惜的是，入侵印度和波斯的雅利安人與他們在這些土地上發現的當地原住民通婚，失去了他們的淺色膚色和金色頭髮，及其理性和勤奮。印度和波斯的文明因此衰落。另一方面，歐洲的雅利安人保持了他們的種族純淨。這就是為什麼歐洲人成功征服世界的原因，以及為什麼他們有資格統治它 - 前提是他們採取預防措施，不要與劣等種族混合。

Such racist theories, prominent and respectable for many decades, have become anathema among scientists and politicians alike. People continue to conduct a heroic struggle against racism without noticing that the battlefield has shifted, and that the place of racism in imperial ideology has now been

replaced by ‘culturism’. There is no such word, but it’s about time we coined it. Among today’s elites, assertions about the contrasting merits of diverse human groups are almost always couched in terms of historical differences between cultures rather than biological differences between races. We no longer say, ‘It’s in their blood.’ We say, ‘It’s in their culture.’

Thus European right-wing parties which oppose Muslim immigration usually take care to avoid racial terminology. Marine le Pen’s speechwriters would have been shown the door on the spot had they suggested that the leader of the Front National go on television to declare that, ‘We don’t want those inferior Semites to dilute our Aryan blood and spoil our Aryan civilisation.’ Instead, the French Front National, the Dutch Party for Freedom, the Alliance for the Future of Austria and their like tend to argue that Western culture, as it has evolved in Europe, is characterised by democratic values, tolerance and gender equality, whereas Muslim culture, which evolved in the Middle East, is characterised by hierarchical politics, fanaticism and misogyny. Since the two cultures are so different, and since many Muslim immigrants are unwilling (and perhaps unable) to adopt Western values, they should not be allowed to enter, lest they foment internal conflicts and corrode European democracy and liberalism.

這樣的種族主義理論曾經占據崇高地位，熱門多年，如今已被科學家和政治家們公認為可恥。人們繼續在英勇地奮鬥對抗種族主義，卻沒有注意到戰場的變化，種族主義在帝國意識形態中的位置現在被「文化主義」所取代。文化主義並不存在，但是正是時候我們需要創造這個詞。在今天的精英中，關於不同的人類群體的優缺點幾乎都是以文化間的歷史差異而非種族生物差異來表達的。我們不再說「這是他們的血液裡的」，我們現在說「這是他們的文化裡的」。因此，反對穆斯林移民的歐洲右翼政黨通常會避免使用種族術語。如果法國國民陣線的領袖瑪麗·勒庞的演說撰稿人建議她上電視宣布：「我們不想要那些低劣的閃米特人來稀釋我們的雅利安血統，破壞我們的雅利安文明。」他們會立刻被開除。相反，法國國民陣線、荷蘭自由黨、奧地利未來聯盟和類似的政黨往往會爭辯說，西方文化，如它在歐洲演變的一樣，以民主價值觀、容忍和性別平等為特徵，而穆斯林文化，如其在中東演變的一樣，則以等級政治、狂熱和厭女症為特徵。由於這兩種文化如此不同，許多穆斯林移民不願意（也許是無法）接受西方

價值觀，所以不應允許他們進入，以免他們挑起內部衝突，並腐蝕歐洲民主和自由主義。

Such culturist arguments are fed by scientific studies in the humanities and social sciences that highlight the so-called clash of civilisations and the fundamental differences between different cultures. Not all historians and anthropologists accept these theories or support their political usages. But whereas biologists today have an easy time disavowing racism, simply explaining that the biological differences between present-day human populations are trivial, it is harder for historians and anthropologists to disavow culturism. After all, if the differences between human cultures are trivial, why should we pay historians and anthropologists to study them?

Scientists have provided the imperial project with practical knowledge, ideological justification and technological gadgets. Without this contribution it is highly questionable whether Europeans could have conquered the world. The conquerors returned the favour by providing scientists with information and protection, supporting all kinds of strange and fascinating projects and spreading the scientific way of thinking to the far corners of the earth. Without imperial support, it is doubtful whether modern science would have progressed very far. There are very few scientific disciplines that did not begin their lives as servants to imperial growth and that do not owe a large proportion of their discoveries, collections, buildings and scholarships to the generous help of army officers, navy captains and imperial governors.

這些文化主義論點源自於人文和社會科學方面的科學研究，強調所謂的文明衝突和不同文化之間的根本差異。並非所有歷史學家和人類學家都接受這些理論或支持它們的政治用途。但是，對於生物學家來說，否認種族主義是很容易的，只需解釋現今人類族群之間的生物學差異微不足道即可，而對於歷史學家和人類學家來說，否認文化主義則較為困難。畢竟，如果人類文化之間的差異微不足道，我們為什麼還需要給歷史學家和人類學家付費去研究它們呢？科學家為帝國計畫提供了實用知識、意識形態正當性和技術小玩意。如果沒有這些貢獻，歐洲人能否征服世界是值得懷疑的。征服者回報科學家的方式是提供信息和保護，支持各種奇怪和迷人的項目以及將科學思維傳播到世界的遠角落。假如沒有帝國的支持，現代科學很可能不會進展得那麼遠。幾乎沒有科學學科是沒有從事帝國發展服務或未得到軍官、海

軍上尉和帝國總督的慷慨幫助，而沒有這些幫助所提供的發現、收藏、建築和獎學金。

This is obviously not the whole story. Science was supported by other institutions, not just by empires. And the European empires rose and flourished thanks also to factors other than science. Behind the meteoric rise of both science and empire lurks one particularly important force: capitalism. Were it not for businessmen seeking to make money, Columbus would not have reached America, James Cook would not have reached Australia, and Neil Armstrong would never have taken that small step on the surface of the moon.

顯然這不是全部的故事。科學不僅受到帝國的支持，還受到其他機構的支持。歐洲帝國的崛起和興盛，也不僅是因為科學的推動。在科學和帝國的驚人崛起背後，潛伏著一個尤其重要的力量：資本主義。如果不是商人為謀取利益，哥倫布就不會到達美洲，詹姆斯·庫克就不會到達澳洲，尼爾·阿姆斯壯也永遠不會在月球表面那邊小踏一步。

16

The Capitalist Creed

MONEY HAS BEEN ESSENTIAL BOTH FOR building empires and for promoting science. But is money the ultimate goal of these undertakings, or perhaps just a dangerous necessity?

It is not easy to grasp the true role of economics in modern history. Whole volumes have been written about how money founded states and ruined them, opened new horizons and enslaved millions, moved the wheels of industry and drove hundreds of species into extinction. Yet to understand modern economic history, you really need to understand just a single word. The word is growth. For better or worse, in sickness and in health, the modern economy has been growing like a hormone-soused teenager. It eats up everything it can find and puts on inches faster than you can count.

For most of history the economy stayed much the same size. Yes, global production increased, but this was due mostly to demographic expansion and the settlement of new lands. Per capita production remained static. But all that changed in the modern age. In 1500, global production of goods and services was equal to about \$250 billion; today it hovers around \$60 trillion. More importantly, in 1500, annual per capita production averaged \$550, while today every man, woman and child produces, on the average, \$8,800 a year. [1](#) What accounts for this stupendous growth?

錢在建立帝國和促進科學方面一直至關重要。但是，錢是這些事業的終極目標嗎？還是只是一種危險的必需品？要理解現代歷史中經濟的真正角色並不容易。關於錢如何創立了一些國家並毀滅了另外一些國家，開辟新的視野並奴役了無數人民，推動產業發展並將數百個物種驅使滅絕，已經寫成了整整一整套的書籍。然而，要理解現代經濟歷史，你只需要理解一個詞語。這個詞語就是增長。無論是好還是壞，在生病和健康的情況下，現代經濟一直像一個充滿激素的青少年一樣

增長。它吞噬了它能找到的一切，增長的速度比你能夠計算的還要快。在大部分的歷史中，經濟的規模保持了相對穩定。是的，全球產量增加了，但這主要是由於人口的擴張和新土地的開墾。人均生產保持不變。但在現代時代，這一切都改變了。在1500年的時候，全球貨物和服務的生產總值約為2500億美元；今天它約為60萬億美元。更重要的是，1500年的時候，每年的人均生產平均為550美元，而今天每個人均生產平均為8800美元。這些驚人的增長是由什麼造成的？

Economics is a notoriously complicated subject. To make things easier, let's imagine a simple example.

Samuel Greedy, a shrewd financier, founds a bank in El Dorado, California.

A. A. Stone, an up-and-coming contractor in El Dorado, finishes his first big job, receiving payment in cash to the tune of \$1 million. He deposits this sum in Mr Greedy's bank. The bank now has \$1 million in capital.

In the meantime, Jane McDoughnut, an experienced but impecunious El Dorado chef, thinks she sees a business opportunity – there's no really good bakery in her part of town. But she doesn't have enough money of her own to buy a proper facility complete with industrial ovens, sinks, knives and pots. She goes to the bank, presents her business plan to Greedy, and persuades him that it's a worthwhile investment. He issues her a \$1 million loan, by crediting her account in the bank with that sum.

經濟學是一個出了名複雜的主題。為了讓事情變得簡單，我們來想像一個簡單的例子。Samuel Greedy是一個精明的金融家，在加利福尼亞的埃爾多拉多鎮創立了一家銀行。一名正在崛起的埃爾多拉多鎮承包商A. A. Stone完成了他的第一個大工程，收到了一百萬美元的現金付款。他將這筆錢匯入了Greedy先生的銀行。現在銀行有了一百萬美元的資本。與此同時，一位經驗豐富但一貧如洗的埃爾多拉多鎮大廚Jane McDoughnut認為她看到了一個商機—她所在的鎮上沒有真正好的麵包店。但她沒有足夠的錢來買一個配備有工業烤爐、水槽、刀具和鍋具的適當場所。她去了銀行，向Greedy先生呈現她的商業計劃，並說服他這是一個值得投資的機會。他發給她一百萬美元的貸款，通過把這筆資金存入她在銀行的帳戶中。

McDoughnut now hires Stone, the contractor, to build and furnish her bakery. His price is \$1,000,000.

When she pays him, with a cheque drawn on her account, Stone deposits it in his account in the Greedy bank.

So how much money does Stone have in his bank account? Right, \$2 million.

How much money, cash, is actually located in the bank's safe? Yes, \$1 million.

It doesn't stop there. As contractors are wont to do, two months into the job Stone informs McDoughnut that, due to unforeseen problems and expenses, the bill for constructing the bakery will actually be \$2 million. Mrs McDoughnut is not pleased, but she can hardly stop the job in the middle. So she pays another visit to the bank, convinces Mr Greedy to give her an additional loan, and he puts another \$1 million in her account. She transfers the money to the contractor's account.

麥當勞甜甜圈現在雇傭承包商 Stone 建造和裝修她的烘焙坊，他的價格是100萬元。當她用自己的支票支付給他時，Stone 在貪婪銀行的帳戶中存款。那麼 Stone 在他的銀行帳戶中有多少錢？是的，是200萬元。在銀行保險箱中實際存放了多少現金？是的，是100萬元。事情還不止這樣。由於承包商經常會這麼做，在工作開始兩個月後，Stone 告訴麥當勞，由於未預見的問題和開支，建造烘焙坊的費用實際上將是200萬元。麥當勞太太不高興，但她幾乎無法停止這項工作。因此，她再次拜訪銀行，說服貪婪先生提供額外的貸款，他在她的帳戶中再增加了100萬元。她轉移這些錢到承包商的帳戶中。

How much money does Stone have in his account now? He's got \$3 million.

But how much money is actually sitting in the bank? Still just \$1 million. In fact, the same \$1 million that's been in the bank all along.

Current US banking law permits the bank to repeat this exercise seven more times. The contractor would eventually have \$10 million in his account, even though the bank still has but \$1 million in its vaults. Banks are allowed to loan \$10 for every dollar they actually possess, which means that 90 per cent

of all the money in our bank accounts is not covered by actual coins and notes.² If all of the account holders at Barclays Bank suddenly demand their money, Barclays will promptly collapse (unless the government steps in to save it). The same is true of Lloyds, Deutsche Bank, Citibank, and all other banks in the world.

現在 Stone 的帳戶裡有多少錢？他有三百萬美元。但實際上，在銀行裡有多少現金呢？仍然只有一百萬美元。事實上，一直以來都是同樣的一百萬美元。目前美國的銀行法允許銀行重複這個演習七次。即使銀行實際上只有一百萬美元在保險庫中，承包商最終會有一千萬美元進入他的帳戶。銀行被允許發放每一美元所擁有的十美元貸款，這意味著我們銀行帳戶中90%的資金都沒有實際的現金支持。如果巴克萊銀行的所有帳戶持有人突然要求他們的錢，該行將立即崩潰（除非政府介入拯救）。這對於勞埃德銀行、德意志銀行、花旗銀行和世界上其他所有銀行也是如此。

It sounds like a giant Ponzi scheme, doesn't it? But if it's a fraud, then the entire modern economy is a fraud. The fact is, it's not a deception, but rather a tribute to the amazing abilities of the human imagination. What enables banks – and the entire economy – to survive and flourish is our trust in the future. This trust is the sole backing for most of the money in the world.

In the bakery example, the discrepancy between the contractor's account statement and the amount of money actually in the bank is Mrs McDoughnut's bakery. Mr Greedy has put the bank's money into the asset, trusting that one day it would be profitable. The bakery hasn't baked a loaf of bread yet, but McDoughnut and Greedy anticipate that a year hence it will be selling thousands of loaves, rolls, cakes and cookies each day, at a handsome profit. Mrs McDoughnut will then be able to repay her loan, with interest. If at that point Mr Stone decides to withdraw his savings, Greedy will be able to come up with the cash. The entire enterprise is thus founded on trust in an imaginary future – the trust that the entrepreneur and the banker have in the bakery of their dreams, along with the contractor's trust in the future solvency of the bank.

這聽起來像是一個巨大的庞氏騙局，不是嗎？但如果它是一個欺詐，那整個現代經濟體系就是詐騙。事實上，這不是一個騙局，而是對人

類想像力驚人能力的一種讚賞。使銀行-和整個經濟體系-能夠生存和繁榮的是我們對未來的信任。這種信任是世界上大部分貨幣的唯一後盾。在烘焙店的例子中，承包商的帳戶聲明與實際存款金額之間的差額就是麥當勞夫人的麵包店。貪婪先生將銀行的錢投入這個資產，相信有一天它會帶來盈利。麵包店還沒有烤過一片麵包，但麥當勞和貪婪先生預計，一年後它將每天出售數千個麵包、餐包、蛋糕和餅乾，並以可觀的利潤為基礎。麥當勞夫人就能夠償還她的貸款，並支付利息。如果此時史東先生決定收回他的儲蓄，貪婪先生將能夠湊出現金。整個企業因此都是建立在對一個虛擬未來的信任基礎上的-企業家和銀行家對他們夢想中的麵包店的信任，以及承包商對銀行未來償還能力的信任。

We've already seen that money is an astounding thing because it can represent myriad different objects and convert anything into almost anything else. However, before the modern era this ability was limited. In most cases, money could represent and convert only things that actually existed in the present. This imposed a severe limitation on growth, since it made it very hard to finance new enterprises.

Consider our bakery again. Could McDoughnut get it built if money could represent only tangible objects? No. In the present, she has a lot of dreams, but no tangible resources. The only way she could get her bakery built would be to find a contractor willing to work today and receive payment in a few years' time, if and when the bakery starts making money. Alas, such contractors are rare breeds. So our entrepreneur is in a bind. Without a bakery, she can't bake cakes. Without cakes, she can't make money. Without money, she can't hire a contractor. Without a contractor, she has no bakery.

我們已經看到，錢是一件驚人的事情，因為它可以代表無數不同的物品，並將任何東西轉換為幾乎任何其他東西。然而，在現代之前，這種能力是有限的。在大多數情況下，貨幣只能代表和轉換當前實際存在的東西。這對增長造成了嚴重限制，因為它使籌集新企業的資金非常困難。再次考慮我們的麵包店。如果錢只能代表有形物品，McDoughnut能建造它嗎？不行。現在，她有很多夢想，但沒有有形資源。她唯一的辦法就是找到一個願意在今天工作並在幾年後收到付款的承包商，如果麵包店開始賺錢的話。可惜，這樣的承包商是很少見的。因此，我們的企業家陷入了困境。如果沒有麵包店，她就不能烤

蛋糕。沒有蛋糕，她就不能賺錢。沒有錢，她就不能雇用承包商。沒有承包商，她就沒有麵包店。

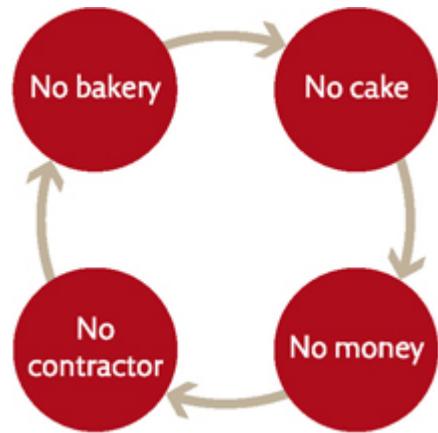
Humankind was trapped in this predicament for thousands of years. As a result, economies remained frozen. The way out of the trap was discovered only in the modern era, with the appearance of a new system based on trust in the future. In it, people agreed to represent imaginary goods – goods that do not exist in the present – with a special kind of money they called ‘credit’. Credit enables us to build the present at the expense of the future. It’s founded on the assumption that our future resources are sure to be far more abundant than our present resources. A host of new and wonderful opportunities open up if we can build things in the present using future income.

If credit is such a wonderful thing, why did nobody think of it earlier? Of course they did. Credit arrangements of one kind or another have existed in all known human cultures, going back at least to ancient Sumer. The problem in previous eras was not that no one had the idea or knew how to use it. It was that people seldom wanted to extend much credit because they didn’t trust that the future would be better than the present. They generally believed that times past had been better than their own times and that the future would be worse, or at best much the same. To put that in economic terms, they believed that the total amount of wealth was limited, if not dwindling. People therefore considered it a bad bet to assume that they personally, or their kingdom, or the entire world, would be producing more wealth ten years down the line. Business looked like a zero-sum game. Of course, the profits of one particular bakery might rise, but only at the expense of the bakery next door. Venice might flourish, but only by impoverishing Genoa. The king of England might enrich himself, but only by robbing the king of France. You could cut the pie in many different ways, but it never got any bigger.

人類在這個困境中困繞了數千年。因此，經濟繼續凍結。只有在現代，以未來為基礎的新系統出現時，才發現了這種陷阱的出路。在這個系統中，人們同意用一種稱為“信貸”的特殊貨幣代表不存在於現在的虛擬商品。信用讓我們以未來為代價建立現在。它是建立在這樣一個假設的基礎上，即我們的未來資源比現在的資源豐富得多。如果我們能夠使用未來的收入來建立現在的事物，就會有一系列全新而美好的機會出現。如果信用如此美妙，為什麼沒有人早想到呢？當然，他

們早就有了這個想法或知道如何使用它。在所有已知的人類文化中，各種類型的信貸安排都存在，至少可以追溯到古代蘇美。在過去的時代中，問題不是沒有人有這個想法或不知道如何使用它，而是人們很少想要擴展太多信貸，因為他們不相信未來會比現在更好。他們通常相信過去的時代比自己的時代更好，未來會更糟，或者至少差不多。把它放在經濟領域，他們相信總財富量是有限的，如果不是正在枯竭。因此，人們認為假定他們個人、他們的王國或整個世界會在十年後生產更多的財富是一個壞打算。商業看起來像一個零和遊戲。當然，一家麵包店的利潤可能會上升，但這是以鄰近麵包店為代價的。威尼斯可能會興旺，但只是通過讓熱那亞變得貧窮。英格蘭國王可能會致富，但只是靠洗劫法王。你可以以很多不同的方式分配餡餅，但它永遠不會變得更大。

That's why many cultures concluded that making bundles of money was sinful. As Jesus said, 'It is easier for a camel to pass through the eye of a needle than for a rich man to enter into the kingdom of God' (Matthew 19:24). If the pie is static, and I have a big part of it, then I must have taken somebody else's slice. The rich were obliged to do penance for their evil deeds by giving some of their surplus wealth to charity.



The Entrepreneur's Dilemma

If the global pie stayed the same size, there was no margin for credit. Credit is the difference between today's pie and tomorrow's pie. If the pie stays the same, why extend credit? It would be an unacceptable risk unless you believed that the baker or king asking for your money might be able to steal a slice from a competitor. So it was hard to get a loan in the premodern world,

and when you got one it was usually *small , short-term , and subject to high interest rates* . Upstart entrepreneurs thus found it difficult to open new bakeries and great kings who wanted to build palaces or wage wars had no choice but to raise the necessary funds through high taxes and tariffs.

這就是為什麼許多文化認為累積財富是罪惡的原因。正如耶穌所說，“比駱駝穿過針孔還難，財主進入神的國度。”（馬太福音 19:24）。如果派是靜態的，而我有它的一大部分，那麼我肯定拿走了其他人的一部分。富人必須通過將部分多餘財富捐給慈善機構來為他們的邪惡行為做補贖。企業家的困境 如果全球派保持不變，就沒有信用的餘地。信用是今天和明天派的區別。如果派保持不變，為什麼要延長信用？除非你相信拿你的錢的麵包師或國王可能會從競爭對手那裡偷走一片麵包。因此，在現代之前很難獲得貸款，並且當你獲得貸款時，它通常很小，短期，並且要支付高利率。初創企業家因此發現開設新麵包店很困難，而想要建造宮殿或發動戰爭的偉大國王除了通過高稅和關稅籌集必要的資金外別無選擇。



The Magic Circle of the Modern Economy

That was fine for kings (as long as their subjects remained docile), but a scullery maid who had a great idea for a bakery and wanted to move up in the world generally could only dream of wealth while scrubbing down the royal kitchens floors.

It was lose-lose. Because credit was limited, people had trouble financing new businesses. Because there were few new businesses, the economy did not grow. Because it did not grow, people assumed it never would, and those who had capital were wary of extending credit. The expectation of stagnation fulfilled itself.

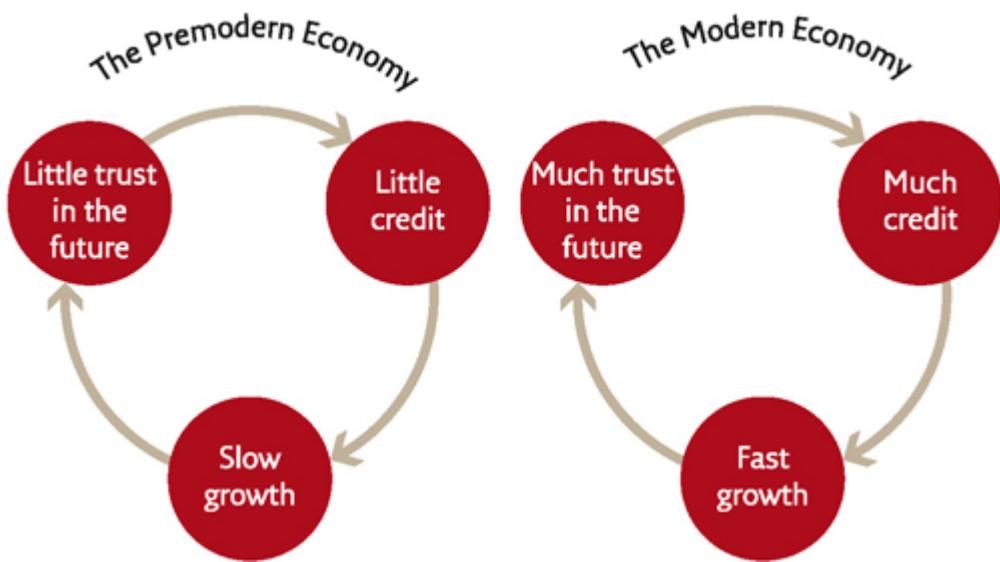
A Growing Pie

Then came the Scientific Revolution and the idea of progress. The idea of progress is built on the notion that if we admit our ignorance and invest resources in research, things can improve. This idea was soon translated into economic terms. Whoever believes in progress believes that geographical discoveries, technological inventions and organisational developments can increase the sum total of human production, trade and wealth. New trade routes in the Atlantic could flourish without ruining old routes in the Indian Ocean. New goods could be produced without reducing the production of old ones. For instance, one could open a new bakery specialising in chocolate cakes and croissants without causing bakeries specialising in bread to go bust. Everybody would simply develop new tastes and eat more. I can be wealthy without you becoming poor; I can be obese without you dying of hunger. The entire global pie can grow.

現代經濟的魔法圈 這對國王來說沒什麼問題（只要他們的臣民保持馴服），但一個想開一家麵包店的廚房女僕，想要晉升，通常只能在擦洗皇家廚房地板時夢想著財富。這是一個雙重失敗。因為信貸有限，人們很難為新企業融資。由於沒有多少新企業，經濟也沒有增長。由於經濟沒有增長，人們認為它永遠不會增長，有資本的人也不敢延長信貸。停滯的預期得到了實現。然後，科學革命和進步的想法出現了。進步的想法建立在承認我們的無知並投資研究資源的構想上。這個想法很快被轉化為經濟與條件。誰相信進步，誰相信地理發現、技術發明和組織發展能增加人類生產、貿易和財富的總量。大西洋的新貿易路線可以繁榮，而不會破壞印度洋的舊路線。可以生產新的商品，而不會減少舊的生產。例如，一個人可以開一家專門生產巧克力蛋糕和可麗餅的新麵包店，而不會使專門生產麵包的麵包店破產。每個人只需要開發新的口味，吃更多的東西。我可以變得富有，而不是

讓你變得貧窮；我可以變得肥胖，而不是讓你餓死。整個全球的價值可以增長。

Over the last 500 years the idea of progress convinced people to put more and more trust in the future. This trust created credit; credit brought real economic growth; and growth strengthened the trust in the future and opened the way for even more credit. It didn't happen overnight – the economy behaved more like a roller coaster than a balloon. But over the long run, with the bumps evened out, the general direction was unmistakable. Today, there is so much credit in the world that governments, business corporations and private individuals easily obtain *large, long-term and low-interest loans* that far exceed current income.



The Economic History of the World in a Nutshell

The belief in the growing global pie eventually turned revolutionary. In 1776 the Scottish economist Adam Smith published *The Wealth of Nations*, probably the most important economics manifesto of all time. In the eighth chapter of its first volume, Smith made the following novel argument: when a landlord, a weaver, or a shoemaker has greater profits than he needs to maintain his own family, he uses the surplus to employ more assistants, in order to further increase his profits. The more profits he has, the more assistants he can employ. It follows that an increase in the profits of private entrepreneurs is the basis for the increase in collective wealth and prosperity.

在過去的500年裡，進步的觀念使人們對未來越來越加信任。這種信任創造了信貸；信貸帶來了真正的經濟增長；而增長強化了對未來的信任，打開了更多信貸的途徑。這不是一夜之間發生的-經濟行為更像是過山車，而不是氣球。但從長遠來看，通過平穩過山車般的震動，總體方向是不可否認的。今天，世界上有這麼多的信貸，以至於政府、企業和私人都可以輕易地獲得大量、長期且低息的貸款，遠遠超過當前的收入。世界經濟史簡史對全球增長餅的信仰最終變得革命性。

1776年，蘇格蘭經濟學家亞當·斯密發表了《國富論》，這可能是有史以來最重要的經濟宣言。在第一卷的第八章中，斯密提出了以下新穎的論證：當房東、織工或鞋匠的利潤超過了維護自己家庭的需要時，他們利用剩餘的資本雇用更多的助手，以進一步增加他們的利潤。他越有利潤，就能雇用越多的助手。結果，私人企業家的利潤增加是增加集體財富和繁榮的基礎。

This may not strike you as very original, because we all live in a capitalist world that takes Smith's argument for granted. We hear variations on this theme every day in the news. Yet Smith's claim that the selfish human urge to increase private profits is the basis for collective wealth is one of the most revolutionary ideas in human history – revolutionary not just from an economic perspective, but even more so from a moral and political perspective. What Smith says is, in fact, that greed is good, and that by becoming richer I benefit everybody, not just myself. *Egoism is altruism* .

Smith taught people to think about the economy as a ‘win-win situation’, in which my profits are also your profits. Not only can we both enjoy a bigger slice of pie at the same time, but the increase in your slice depends upon the increase in my slice. If I am poor, you too will be poor since I cannot buy your products or services. If I am rich, you too will be enriched since you can now sell me something. Smith denied the traditional contradiction between wealth and morality, and threw open the gates of heaven for the rich. Being rich meant being moral. In Smith's story, people become rich not by despoiling their neighbours, but by increasing the overall size of the pie. And when the pie grows, everyone benefits. The rich are accordingly the most useful and benevolent people in society, because they turn the wheels of growth for everyone's advantage.

這可能不會讓你感到很新穎，因為我們所有人都生活在一個將史密斯的論點視為理所當然的資本主義世界中。我們每天都在聽到這種主題的變化。然而，史密斯所聲稱的自私的人類增加私人利潤的衝動是集體財富的基礎，這是人類歷史上最具革命性的思想之一 - 革命不僅從經濟角度來看，甚至更從道德和政治角度來看。事實上，史密斯所說的是，貪婪是好的，通過變得更富有，我不僅受益，還使大家受益，而不僅僅是自己。利他主義就是自我利益最大化。史密斯教人們把經濟看作是“雙贏”的情況，我的利潤也是你的利潤。我們不僅可以同時享受更大的餅片，而且你的餅片的增加取決於我的餅片的增加。如果我很窮，你也會很窮，因為我無法購買你的產品或服務。如果我很有錢，你也會變得更富有，因為你現在可以賣東西給我了。史密斯否定了財富與道德之間的傳統矛盾，並為富人打開了天堂的大門。有錢就意味著有道德。在史密斯的故事中，人們變得富有，不是通過掠奪他們的鄰居，而是通過增加餅圖的整體尺寸。當餅圖變大時，每個人都受益。富人因此是社會中最有用和慈善的人，因為他們為每個人的利益推動增長。

All this depends, however, on the rich using their profits to open new factories and hire new employees, rather than wasting them on non-productive activities. Smith therefore repeated like a mantra the maxim that ‘When profits increase, the landlord or weaver will employ more assistants’ and not ‘When profits increase, Scrooge will hoard his money in a chest and take it out only to count his coins.’ A crucial part of the modern capitalist economy was the emergence of a new ethic, according to which profits ought to be reinvested in production. This brings about more profits, which are again reinvested in production, which brings more profits, et cetera ad infinitum. Investments can be made in many ways: enlarging the factory, conducting scientific research, developing new products. Yet all these investments must somehow increase production and translate into larger profits. In the new capitalist creed, the first and most sacred commandment is: ‘The profits of production must be reinvested in increasing production.’

所有這些都取決於富人利用他們的利潤開設新工廠和招聘新員工，而不是在非生產活動上浪費它們。史密斯因此反覆重申一句口號：“當利潤增加時，地主或織工將聘用更多助手”，而不是“當利潤增加時，史高吉會把他的錢存放在箱子裡，只在結算硬幣時拿出來。”現代資本主

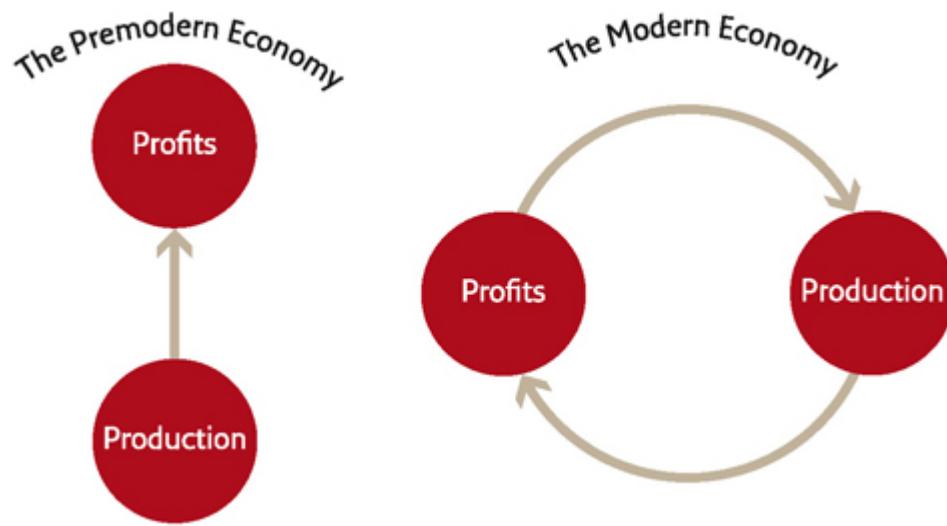
義經濟的一個關鍵部分是出現了一種新的倫理觀，根據這種觀點，利潤應該被再投資到生產中。這會帶來更多的利潤，這些利潤再次被再投資到生產中，這帶來更多的利潤，依此類推。投資可以以許多方式進行：擴大工廠，進行科學研究，開發新產品。然而，所有這些投資都必須在某種程度上增加生產並轉化為更大的利潤。在新的資本主義信條中，第一條和最神聖的戒律是：“生產的利潤必須再投資以增加生產。”

That's why capitalism is called 'capitalism'. Capitalism distinguishes 'capital' from mere 'wealth'. Capital consists of money, goods and resources that are invested in production. Wealth, on the other hand, is buried in the ground or wasted on unproductive activities. A pharaoh who pours resources into a non-productive pyramid is not a capitalist. A pirate who loots a Spanish treasure fleet and buries a chest full of glittering coins on the beach of some Caribbean island is not a capitalist. But a hard-working factory hand who reinvests part of his income in the stock market is.

The idea that 'The profits of production must be reinvested in increasing production' sounds trivial. Yet it was alien to most people throughout history. In premodern times, people believed that production was more or less constant. So why reinvest your profits if production won't increase by much, no matter what you do? Thus medieval noblemen espoused an ethic of generosity and conspicuous consumption. They spent their revenues on tournaments, banquets, palaces and wars, and on charity and monumental cathedrals. Few tried to reinvest profits in increasing their manors' output, developing better kinds of wheat, or looking for new markets.

這就是為什麼資本主義被稱為'資本主義'。資本主義區分了'資本'和普通的'財富'。資本包括投入生產的金錢、商品和資源。另一方面，財富是埋藏在地下或浪費在非生產性活動上的。一個將資源投入到非生產性金字塔的法老不是資本家。掠奪西班牙財寶艦隊、在加勒比海一個海灘上埋藏一箱閃閃發光的硬幣的海盜也不是資本家。但辛勤工作的工廠工人，在股票市場上再投資一部分收入的人才是。生產利潤必須投入再增加生產力的理念聽起來很簡單。然而在歷史上，大多數人都不認同這種觀念。在前現代時期，人們認為生產力是大致相等的。如果生產力不會因為你做了什麼而大幅提高，那麼為什麼要重新投資利潤呢？因此，中世紀貴族肯定了慷慨和顯招消費的道德，他們將收入

花費在比賽、宴會、宮殿和戰爭上，還有慈善事業和紀念性的大教堂上。很少有人試圖將利潤重新投資到增加產出、開發更好的小麥品種或尋找新市場上。



In the modern era, the nobility has been overtaken by a new elite whose members are true believers in the capitalist creed. The new capitalist elite is made up not of dukes and marquises, but of board chairmen, stock traders and industrialists. These magnates are far richer than the medieval nobility, but they are far less interested in extravagant consumption, and they spend a much smaller part of their profits on non-productive activities.

Medieval noblemen wore colourful robes of gold and silk, and devoted much of their time to attending banquets, carnivals and glamorous tournaments. In comparison, modern CEOs don dreary uniforms called suits that afford them all the panache of a flock of crows, and they have little time for festivities. The typical venture capitalist rushes from one business meeting to another, trying to figure out where to invest his capital and following the ups and downs of the stocks and bonds he owns. True, his suits might be Versace and he might get to travel in a private jet, but these expenses are nothing compared to what he invests in increasing human production.

在現代社會中，貴族階層已被一群真正信奉資本主義信條的新精英所取代。這些新資本主義精英的成員不再是公爵和侯爵，而是董事長、股票交易員和實業家。這些大亨比中世紀貴族更加富有，但對奢侈消費的興趣卻少，他們只花費小部分利潤在非生產性活動上。中世紀貴

族穿著彩色的金緞長袍，花費大量時間參加宴會、狂歡節和華麗的錦標賽。相比之下，現代的CEO們穿著讓他們看起來像一群烏鵲的單調制服，並且幾乎沒有時間參加節日慶典。一般的風險投資家匆匆忙忙地從一個商務會議衝到另一個，試圖找到他能夠投資的地方，追蹤他所擁有的股票和債券的漲跌走勢。確實，他的西裝或許是Versace的，他或許可以坐私人飛機旅行，但這些花費與他投資於增加人類生產力相比微不足道。

It's not just Versace-clad business moguls who invest to increase productivity. Ordinary folk and government agencies think along similar lines. How many dinner conversations in modest neighbourhoods sooner or later bog down in interminable debate about whether it is better to invest one's savings in the stock market, bonds or property? Governments too strive to invest their tax revenues in productive enterprises that will increase future income – for example, building a new port could make it easier for factories to export their products, enabling them to make more taxable income, thereby increasing the government's future revenues. Another government might prefer to invest in education, on the grounds that educated people form the basis for the lucrative high-tech industries, which pay lots of taxes without needing extensive port facilities.

不僅是穿著Versace西裝的商業巨頭投資以增加生產力，普通人和政府機構也有相似的想法。在平凡社區的晚餐談話中，有多少在一段時間之後陷入了關於將儲蓄投資於股市、債券還是房產更好的無休止辯論？政府也致力於將稅收投資於生產性企業，以增加未來收入，例如，建造一個新港口可以使工廠更容易出口產品，使他們獲得更多應納稅收，從而增加政府的未來收入。另一個政府可能更喜歡投資於教育，理由是受過教育的人形成了盈利豐厚的高科技產業的基礎，這些行業支付大量稅收，而不需要廣泛的港口設施。

Capitalism began as a theory about how the economy functions. It was both descriptive and prescriptive – it offered an account of how money worked and promoted the idea that reinvesting profits in production leads to fast economic growth. But capitalism gradually became far more than just an economic doctrine. It now encompasses an ethic – a set of teachings about how people should behave, educate their children and even think. Its principal tenet is that economic growth is the supreme good, or at least a

proxy for the supreme good, because justice, freedom and even happiness all depend on economic growth. Ask a capitalist how to bring justice and political freedom to a place like Zimbabwe or Afghanistan, and you are likely to get a lecture on how economic affluence and a thriving middle class are essential for stable democratic institutions, and about the need therefore to inculcate Afghan tribesmen in the values of free enterprise, thrift and self-reliance.

資本主義最初是關於經濟運作的一個理論。它既是描述性的，也是規定性的 – 它提供了有關金錢如何運作的說明，並推廣了利用利潤再投資於生產的概念能夠帶來快速的經濟增長。但是，資本主義逐漸超越了經濟教義的範疇，現在已涵蓋一種倫理觀 – 一套關於人們應如何行為、教育他們的子女，甚至思考的教導。其主要原則是經濟增長是至高無上的善，或者至少是最善的代理，因為正義、自由甚至幸福都取決於經濟增長。問一個資本家如何為像津巴布韋或阿富汗這樣的地方帶來正義和政治自由，你可能會得到一個關於如何為穩定民主機構建立必要的經濟富裕和繁榮中產階級的演講，以及有關需要讓阿富汗部落民習得自由企業、節儉和自力更生的價值觀的必要性。

This new religion has had a decisive influence on the development of modern science, too. Scientific research is usually funded by either governments or private businesses. When capitalist governments and businesses consider investing in a particular scientific project, the first questions are usually, ‘Will this project enable us to increase production and profits? Will it produce economic growth?’ A project that can’t clear these hurdles has little chance of finding a sponsor. No history of modern science can leave capitalism out of the picture.

Conversely, the history of capitalism is unintelligible without taking science into account. Capitalism’s belief in perpetual economic growth flies in the face of almost everything we know about the universe. A society of wolves would be extremely foolish to believe that the supply of sheep would keep on growing indefinitely. The human economy has nevertheless managed to grow exponentially throughout the modern era, thanks only to the fact that scientists come up with another discovery or gadget every few years – such as the continent of America, the internal combustion engine, or genetically

engineered sheep. Banks and governments print money, but ultimately, it is the scientists who foot the bill.

這種新宗教對現代科學的發展也有決定性影響。科學研究通常是由政府或私人企業資助。當資本主義政府和企業考慮投資某個科學項目時，首要問題通常是，“這個項目是否能夠增加生產和利潤？它是否會帶來經濟增長？”一個無法通過這些障礙的項目很難找到贊助商。現代科學的歷史絕不能忽略了資本主義的影響。相反，如果不考慮科學的作用，在理解資本主義的歷史上是不可理解的。資本主義對於永續經濟增長的信念違背了我們對宇宙幾乎所有的認知。像狼群一樣的社會相信羊的供應將無窮無盡地增長，這是極其愚蠢的。然而，人類經濟在現代時期已經實現了指數級增長，這歸功於科學家每幾年就能提出一個新發現或小發明，例如美洲大陸、內燃機或基因工程羊。銀行和政府可以印刷貨幣，但最終，買單的是科學家。

Over the last few years, banks and governments have been frenziedly printing money. Everybody is terrified that the current economic crisis may stop the growth of the economy. So they are creating trillions of dollars, euros and yen out of thin air, pumping cheap credit into the system, and hoping that the scientists, technicians and engineers will manage to come up with something really big, before the bubble bursts. Everything depends on the people in the labs. New discoveries in fields such as biotechnology and nanotechnology could create entire new industries, whose profits could back the trillions of make-believe money that the banks and governments have created since 2008. If the labs do not fulfil these expectations before the bubble bursts, we are heading towards very rough times.

在過去幾年裡，銀行和政府一直瘋狂地印鈔。每個人都擔心當前的經濟危機可能會停止經濟的增長。因此，他們從空中創造了數以萬計的美元、歐元和日元，將廉價信貸注入系統，並希望科學家、技術人員和工程師能在泡沫破裂之前想出真正大的東西。一切都取決於實驗室裡的人。生物技術和納米技術等領域的新發現可以創造出全新的產業，其利潤可以支持銀行和政府自2008年以來創造的虛擬貨幣數以兆計。如果實驗室在泡沫破裂之前無法實現這些期望，我們將走向非常艱難的時期。

Columbus Searches for an Investor

Capitalism played a decisive role not only in the rise of modern science, but also in the emergence of European imperialism. And it was European imperialism that created the capitalist credit system in the first place. Of course, credit was not invented in modern Europe. It existed in almost all agricultural societies, and in the early modern period the emergence of European capitalism was closely linked to economic developments in Asia. Remember, too, that until the late eighteenth century, Asia was the world's economic powerhouse, meaning that Europeans had far less capital at their disposal than the Chinese, Muslims or Indians.

However, in the sociopolitical systems of China, India and the Muslim world, credit played only a secondary role. Merchants and bankers in the markets of Istanbul, Isfahan, Delhi and Beijing may have thought along capitalist lines, but the kings and generals in the palaces and forts tended to despise merchants and mercantile thinking. Most non-European empires of the early modern era were established by great conquerors such as Nurhaci and Nader Shah, or by bureaucratic and military elites as in the Qing and Ottoman empires. Financing wars through taxes and plunder (without making fine distinctions between the two), they owed little to credit systems, and they cared even less about the interests of bankers and investors.

資本主義不僅在現代科學的興起中扮演了決定性的角色，還促成了歐洲帝國主義的出現。歐洲帝國主義在首次創造了資本主義信用系統。當然，信貸不是現代歐洲發明的。它存在於幾乎所有農業社會中，在早期現代時期，歐洲資本主義的出現與亞洲的經濟發展密切相關。還記得，直到18世紀末，亞洲是世界經濟的動力，這意味著歐洲人擁有的資本遠比中國人，穆斯林或印度人少得多。然而，在中國，印度和穆斯林世界的社會政治體系中，信貸只扮演次要的角色。伊斯坦布爾，伊斯法罕，德里和北京市場的商人和銀行家可能會思考資本主義的思想，但宮殿和堡壘中的國王和將軍們往往鄙視商人和商業思想。大多數早期現代時期的非歐洲帝國都是由偉大的征服者（如努爾哈赤和納德爾·沙阿）或由官僚和軍事精英（如清朝和鄂圖曼帝國）建立的。他們通過徵稅和搶劫（不做細微區別）來為戰爭提供資金，他們對信貸系統的貢獻並不大，對銀行家和投資者的利益更是漠不關心。

In Europe, on the other hand, kings and generals gradually adopted the mercantile way of thinking, until merchants and bankers became the ruling elite. The European conquest of the world was increasingly financed through credit rather than taxes, and was increasingly directed by capitalists whose main ambition was to receive maximum returns on their investments. The empires built by bankers and merchants in frock coats and top hats defeated the empires built by kings and noblemen in gold clothes and shining armour. The mercantile empires were simply much shrewder in financing their conquests. Nobody wants to pay taxes, but everyone is happy to invest.

In 1484 Christopher Columbus approached the king of Portugal with the proposal that he finance a fleet that would sail westward to find a new trade route to East Asia. Such explorations were a very risky and costly business. A lot of money was needed in order to build ships, buy supplies, and pay sailors and soldiers – and there was no guarantee that the investment would yield a return. The king of Portugal declined.

相反地，在歐洲，國王和將領們逐漸採用了商業思維，直到商人和銀行家成為統治菁英。歐洲對世界的征服越來越多地通過信貸而非稅收進行融資，並越來越多地由主要追求投資回報最大化的資本家指導。穿著燕尾服和高頂禮帽的銀行家和商人所建立的帝國戰勝了那些穿著金衣和光鮮盔甲的國王和貴族所建立的帝國。商業帝國在融資征服方面更加精明。沒有人想付稅，但每個人都樂意投資。1484年，克里斯托弗·哥倫布向葡萄牙國王提出建議，請他資助一支船隊向西航行，尋找到達東亞的新貿易路線。這樣的探險極其危險且成本高昂。需要大量資金來建造船只，購買物資，支付水手和士兵的薪酬，而且不能保證投資會有回報。葡萄牙國王拒絕了。

Like a present-day start-up entrepreneur, Columbus did not give up. He pitched his idea to other potential investors in Italy, France, England, and again in Portugal. Each time he was rejected. He then tried his luck with Ferdinand and Isabella, rulers of newly united Spain. He took on some experienced lobbyists, and with their help he managed to convince Queen Isabella to invest. As every school-child knows, Isabella hit the jackpot. Columbus' discoveries enabled the Spaniards to conquer America, where they established gold and silver mines as well as sugar and tobacco

plantations that enriched the Spanish kings, bankers and merchants beyond their wildest dreams.

A hundred years later, princes and bankers were willing to extend far more credit to Columbus' successors, and they had more capital at their disposal, thanks to the treasures reaped from America. Equally important, princes and bankers had far more trust in the potential of exploration, and were more willing to part with their money. This was the magic circle of imperial capitalism: credit financed new discoveries; discoveries led to colonies; colonies provided profits; profits built trust; and trust translated into more credit. Nurhaci and Nader Shah ran out of fuel after a few thousand kilometres. Capitalist entrepreneurs only increased their financial momentum from conquest to conquest.

像現代的創業家一樣，哥倫布並未放棄。他向義大利、法國、英格蘭和葡萄牙的其他潛在投資者推銷他的想法。每次都遭到拒絕。然後，他嘗試向新統一的西班牙統治者費迪南德和伊莎貝拉兜售。他找了一些經驗豐富的游說者，並在他們的幫助下說服了伊莎貝拉女王投資。正如每個學童所知道的那樣，伊莎貝拉命中了頭獎。哥倫布的發現使西班牙人能夠征服美洲，在那裡建立金銀礦場以及豐富了西班牙國王、銀行家和商人的煙草和甘蔗種植園，超出了他們最瘋狂的夢想。一百年後，王子和銀行家願意向哥倫布的繼承人提供更多的信貸，而且他們擁有更多的資本，得益於從美洲收穫的寶藏。同樣重要的是，王子和銀行家對探索的潛力更有信心，更願意拿出他們的錢。這是帝國資本主義的魔法圈：信貸資助了新的發現；發現導致了殖民地；殖民地提供了利潤；利潤建立了信任；信任轉化為更多的信貸。努爾哈赤和納德爾沙在幾千公里後便用盡了燃料，而資本主義企業家則通過征服來增加他們的財務動力。

But these expeditions remained chancy affairs, so credit markets nevertheless remained quite cautious. Many expeditions returned to Europe empty-handed, having discovered nothing of value. The English, for instance, wasted a lot of capital in fruitless attempts to discover a north-western passage to Asia through the Arctic. Many other expeditions didn't return at all. Ships hit icebergs, foundered in tropical storms, or fell victim to pirates. In order to increase the number of potential investors and reduce the risk they incurred, Europeans turned to limited liability joint-stock companies. Instead of a

single investor betting all his money on a single rickety ship, the joint-stock company collected money from a large number of investors, each risking only a small portion of his capital. The risks were thereby curtailed, but no cap was placed on the profits. Even a small investment in the right ship could turn you into a millionaire.

但是這些遠征仍然是冒險的事情，因此信貸市場仍然相當謹慎。許多遠征空手而歸，發現了毫無價值的東西。例如，英國在嘗試通過北極發現通往亞洲的西北航道上浪費了大量資本。許多其他遠征根本沒有返回。船隻撞上了冰山，在熱帶風暴中倒下，或成為海盜的犧牲品。為了增加潛在投資者的數量並減少他們遭受的風險，歐洲人轉向有限公司。股份有限公司從眾多投資者那裡籌集資金，而不是一個單一的投資者將所有錢都押在一艘不穩定的船上，每個人只冒著資本的一小部分風險。風險因此得以削減，但利潤並沒有上限。即使在正確的船上進行小額投資，也可以使您成為百萬富翁。

Decade by decade, western Europe witnessed the development of a sophisticated financial system that could raise large amounts of credit on short notice and put it at the disposal of private entrepreneurs and governments. This system could finance explorations and conquests far more efficiently than any kingdom or empire. The new-found power of credit can be seen in the bitter struggle between Spain and the Netherlands. In the sixteenth century, Spain was the most powerful state in Europe, holding sway over a vast global empire. It ruled much of Europe, huge chunks of North and South America, the Philippine Islands, and a string of bases along the coasts of Africa and Asia. Every year, fleets heavy with American and Asian treasures returned to the ports of Seville and Cadiz. The Netherlands was a small and windy swamp, devoid of natural resources, a small corner of the king of Spain's dominions.

西歐這十年挑戰看到一個複雜金融體系的發展，可以快速籌集大量信用並提供給私人企業家和政府。這個系統比任何王國或帝國都能更有效地籌措探險和征服的資金。信用的新權力可以在西班牙和荷蘭之間的激烈爭鬥中看到。在16世紀，西班牙是歐洲最強大的國家，掌控著廣闊的全球帝國。它統治著歐洲大部分地區、北南美洲的大面積領土、菲律賓群島和沿著非洲和亞洲海岸的一系列基地。每年，裝載著

美洲和亞洲財寶的艦隊返回塞維利亞和加迪斯的港口。荷蘭是一個小而多風的沼澤，缺乏自然資源，是西班牙國王領土的一個小角落。

In 1568 the Dutch, who were mainly Protestant, revolted against their Catholic Spanish overlord. At first the rebels seemed to play the role of Don Quixote, courageously tilting at invincible windmills. Yet within eighty years the Dutch had not only secured their independence from Spain, but had managed to replace the Spaniards and their Portuguese allies as masters of the ocean highways, build a global Dutch empire, and become the richest state in Europe.

The secret of Dutch success was credit. The Dutch burghers, who had little taste for combat on land, hired mercenary armies to fight the Spanish for them. The Dutch themselves meanwhile took to the sea in ever-larger fleets. Mercenary armies and cannon-brandishing fleets cost a fortune, but the Dutch were able to finance their military expeditions more easily than the mighty Spanish Empire because they secured the trust of the burgeoning European financial system at a time when the Spanish king was carelessly eroding its trust in him. Financiers extended the Dutch enough credit to set up armies and fleets, and these armies and fleets gave the Dutch control of world trade routes, which in turn yielded handsome profits. The profits allowed the Dutch to repay the loans, which strengthened the trust of the financiers. Amsterdam was fast becoming not only one of the most important ports of Europe, but also the continent's financial Mecca.

1568年，主要信奉新教的荷蘭人與天主教的西班牙統治者爆發起義。起初，叛軍看起來像唐·吉訶德一樣，勇敢地與不可戰勝的風車競技。然而，在八十年內，荷蘭人不僅從西班牙獲得了獨立，還成功代替西班牙人和他們的葡萄牙盟友成為海上主宰，建立起全球的荷蘭帝國，成為歐洲最富有的國家。荷蘭成功的秘密在於信貸。荷蘭城市居民對於陸地戰鬥並不感興趣，因此僱傭僱傭兵軍隊與西班牙人作戰。與此同時，荷蘭人也開始組織越來越龐大的船隊出海。僱傭兵軍隊和持有大砲的船隊需要花費大筆財富，但由於荷蘭在西班牙國王濫用權力並破壞歐洲金融體系的信任時成功獲得歐洲金融體系信任，因此荷蘭得以比強大的西班牙帝國更輕易地財務支持其軍事行動。金融家向荷蘭人提供足夠的信貸來建立軍隊和船隊，而這些軍隊與船隊掌握了世界貿易路線，從而產生可觀的利潤。這些利潤使荷蘭得以償還貸

款，並加強金融家對其的信任。阿姆斯特丹不僅成為歐洲最重要的港口之一，還成為歐洲的金融中心。

How exactly did the Dutch win the trust of the financial system? Firstly, they were sticklers about repaying their loans on time and in full, making the extension of credit less risky for lenders. Secondly, their country's judicial system enjoyed independence and protected private rights – in particular private property rights. Capital trickles away from dictatorial states that fail to defend private individuals and their property. Instead, it flows into states upholding the rule of law and private property.

Imagine that you are the son of a solid family of German financiers. Your father sees an opportunity to expand the business by opening branches in major European cities. He sends you to Amsterdam and your younger brother to Madrid, giving you each 10,000 gold coins to invest. Your brother lends his start-up capital at interest to the king of Spain, who needs it to raise an army to fight the king of France. You decide to lend yours to a Dutch merchant, who wants to invest in scrubland on the southern end of a desolate island called Manhattan, certain that property values there will skyrocket as the Hudson River turns into a major trade artery. Both loans are to be repaid within a year.

荷蘭人如何贏得金融系統的信任？首先，他們非常謹慎地按時全額還款，減少了貸方的風險。其次，他們國家的司法體系獨立，保護私人權利，尤其是私有財產權。資本從無法保護個人和財產權的獨裁國家流失。相反地，它流入堅持法治和私有財產權的國家。想像一下，你是一個德國金融家族的孩子。你的父親看到機會，想通過在主要歐洲城市開設分支機構來擴大業務。他派你去阿姆斯特丹，你的弟弟去馬德里，並給你們各自10,000金幣進行投資。你的弟弟將他的啟動資本以利息貸給西班牙國王，他需要這筆錢來籌集軍隊對抗法國國王。你決定將你的資本貸給一位荷蘭商人，他希望投資南端一個荒涼島嶼書面價值將在哈德遜河成為主要貿易動脈後飆升的灌木地帶。這兩筆貸款都要在一年內償還。

The year passes. The Dutch merchant sells the land he's bought at a handsome markup and repays your money with the interest he promised. Your father is pleased. But your little brother in Madrid is getting nervous. The

war with France ended well for the king of Spain, but he has now embroiled himself in a conflict with the Turks. He needs every penny to finance the new war, and thinks this is far more important than repaying old debts. Your brother sends letters to the palace and asks friends with connections at court to intercede, but to no avail. Not only has your brother not earned the promised interest – he's lost the principal. Your father is not pleased.

Now, to make matters worse, the king sends a treasury official to your brother to tell him, in no uncertain terms, that he expects to receive another loan of the same size, forthwith. Your brother has no money to lend. He writes home to Dad, trying to persuade him that this time the king will come through. The paterfamilias has a soft spot for his youngest, and agrees with a heavy heart. Another 10,000 gold coins disappear into the Spanish treasury, never to be seen again. Meanwhile in Amsterdam, things are looking bright. You make more and more loans to enterprising Dutch merchants, who repay them promptly and in full. But your luck does not hold indefinitely. One of your usual clients has a hunch that wooden clogs are going to be the next fashion craze in Paris, and asks you for a loan to set up a footwear emporium in the French capital. You lend him the money, but unfortunately the clogs don't catch on with the French ladies, and the disgruntled merchant refuses to repay the loan.

一年過去了。荷蘭商人以高利潤賣掉他所買的土地，按照他承諾的利息還你的錢。你父親很高興。但你在馬德里的小弟弟開始感到緊張。與法國的戰爭對西班牙國王來說結束得很好，但現在他卷入了與土耳其的衝突。他需要每一筆錢來資助新的戰爭，認為這比還債更重要。你弟弟寄信到皇宮，並請有關係的朋友干預，但都沒有成功。你的弟弟不僅沒有獲得承諾的利息，還失去了本金。你父親不高興了。現在，情況變得更糟，國王派出財政官員到你弟弟那裡，明確告訴他，他期望立即再次獲得同等大小的貸款。你的弟弟沒有錢可以借出。他回家寫信給爸爸，試圖說服他這次國王會履行諾言。你父親對他最小的孩子有好感，並沉重地同意。另外的10,000金幣消失在西班牙的金庫裡，再也沒有被看到。與此同時，在阿姆斯特丹，情況看起來很好。你借更多錢給有企業家精神的荷蘭商人，他們及時而全額地還款。但你的運氣並不無限。你的一位常客有一種預感，木鞋將成為巴黎下一個時尚瘋狂，並向你借錢在法國首都開設一家鞋店。你借錢給

他，但不幸的是，木鞋在法國女士中並沒有受到歡迎，不滿的商人拒絕還款。

Your father is furious, and tells both of you it is time to unleash the lawyers. Your brother files suit in Madrid against the Spanish monarch, while you file suit in Amsterdam against the erstwhile wooden-shoe wizard. In Spain, the law courts are subservient to the king – the judges serve at his pleasure and fear punishment if they do not do his will. In the Netherlands, the courts are a separate branch of government, not dependent on the country's burghers and princes. The court in Madrid throws out your brother's suit, while the court in Amsterdam finds in your favour and puts a lien on the clog-merchant's assets to force him to pay up. Your father has learned his lesson. Better to do business with merchants than with kings, and better to do it in Holland than in Madrid.

您的父親非常憤怒，告訴你們兩個該是放任律師的時候了。你的兄弟在馬德里對西班牙君主提起訴訟，而你則在阿姆斯特丹對昔日的木鞋巫師提起訴訟。在西班牙，法院聽命於國王，法官隨其高興，不聽從他的意願就會受到懲罰。而在荷蘭，法院是政府的一個獨立分支，不依賴於國家的市民和王子。馬德里的法院駁回了你兄弟的訴訟，而阿姆斯特丹的法院裁定你勝訴，並對木鞋商人的資產進行留置，以迫使他支付賠償。你的父親已經吸取了教訓。與商人交易比與國王做生意更好，在荷蘭做生意也比在馬德里更好。

And your brother's travails are not over. The king of Spain desperately needs more money to pay his army. He's sure that your father has cash to spare. So he brings trumped-up treason charges against your brother. If he doesn't come up with 20,000 gold coins forthwith, he'll get cast into a dungeon and rot there until he dies.

Your father has had enough. He pays the ransom for his beloved son, but swears never to do business in Spain again. He closes his Madrid branch and relocates your brother to Rotterdam. Two branches in Holland now look like a really good idea. He hears that even Spanish capitalists are smuggling their fortunes out of their country. They, too, realise that if they want to keep their money and use it to gain more wealth, they are better off investing it where

the rule of law prevails and where private property is respected – in the Netherlands, for example.

而你弟弟的苦难并没有结束。西班牙国王极其需要更多金钱来支付他的军队。他确信你的父亲还有富裕的现金。因此他对你的兄弟提出了捏造的叛国罪。如果他不能立刻拿出2万金币，他将被投入监狱，并在那里慢慢煎熬直到死亡。你的父亲已经受够了。他支付了赎金拯救了他心爱的儿子，但发誓再也不在西班牙做生意。他关闭了马德里分支机构，将你的兄弟搬到鹿特丹。在荷兰开两个分支看起来是一个非常好的主意。他听说，即使是西班牙的资本家们也在走私他们的财富出境。他们也认识到，如果他们想保护自己的财产并利用它来获得更多的财富，他们最好将其投资到法治得到尊重和私人财产得到尊重的地方，例如荷兰。

In such ways did the king of Spain squander the trust of investors at the same time that Dutch merchants gained their confidence. And it was the Dutch merchants – not the Dutch state – who built the Dutch Empire. The king of Spain kept on trying to finance and maintain his conquests by raising unpopular taxes from a disgruntled populace. The Dutch merchants financed conquest by getting loans, and increasingly also by selling shares in their companies that entitled their holders to receive a portion of the company's profits. Cautious investors who would never have given their money to the king of Spain, and who would have thought twice before extending credit to the Dutch government, happily invested fortunes in the Dutch joint-stock companies that were the mainstay of the new empire.

西班牙國王浪費了投資者的信任，而荷蘭商人卻贏得了他們的信心。建立荷蘭帝國的是荷蘭商人，而非荷蘭國家。西班牙國王一直試圖通過向不滿的民眾徵收不受歡迎的稅收來籌集資金和維持他的征服。荷蘭商人通過獲得貸款，越來越多地通過出售公司股票資助征服，這些股票可使持有者獲得公司利潤的一部分。謹慎的投資者從未將他們的資金交給西班牙國王，並且在向荷蘭政府提供信貸前仔細考慮，他們很樂意投資於新帝國的主要支柱荷蘭股份制公司。

If you thought a company was going to make a big profit but it had already sold all its shares, you could buy some from people who owned them, probably for a higher price than they originally paid. If you bought shares and

later discovered that the company was in dire straits, you could try to unload your stock for a lower price. The resulting trade in company shares led to the establishment in most major European cities of stock exchanges, places where the shares of companies were traded.

The most famous Dutch joint-stock company, the Vereenigde Oostindische Compagnie, or VOC for short, was chartered in 1602, just as the Dutch were throwing off Spanish rule and the boom of Spanish artillery could still be heard not far from Amsterdam's ramparts. VOC used the money it raised from selling shares to build ships, send them to Asia, and bring back Chinese, Indian and Indonesian goods. It also financed military actions taken by company ships against competitors and pirates. Eventually VOC money financed the conquest of Indonesia.

如果你认为一家公司将会获得巨额利润，但它已经卖出了所有的股份，你可以从拥有这些股份的人那里购买一些，很可能比他们最初购买的价格更高。如果你购买了股票，后来发现该公司处于困境，你可以尝试以较低的价格出售你的股票。公司股票的交易结果导致在大多数主要欧洲城市建立了股票交易所，这些地方交易公司的股票。最著名的荷兰联合股份公司，简称VOC，成立于1602年，正值荷兰人摆脱西班牙统治，西班牙炮兵的繁荣仍可在阿姆斯特丹城墙不远处听到。VOC利用从出售股票中筹集的资金建造船只，将它们送往亚洲，并带回中国、印度和印度尼西亚的商品。它还资助公司船只对竞争对手和海盗进行的军事行动。最终，VOC的资金资助了印度尼西亚的征服。

Indonesia is the world's biggest archipelago. Its thousands upon thousands of islands were ruled in the early seventeenth century by hundreds of kingdoms, principalities, sultanates and tribes. When VOC merchants first arrived in Indonesia in 1603, their aims were strictly commercial. However, in order to secure their commercial interests and maximise the profits of the shareholders, VOC merchants began to fight against local potentates who charged inflated tariffs, as well as against European competitors. VOC armed its merchant ships with cannons; it recruited European, Japanese, Indian and Indonesian mercenaries; and it built forts and conducted full-scale battles and sieges. This enterprise may sound a little strange to us, but in the early modern age it was common for private companies to hire not only soldiers, but also generals and admirals, cannons and ships, and even entire

off-the-shelf armies. The international community took this for granted and didn't raise an eyebrow when a private company established an empire.

印度尼西亞是世界上最大的群島國家，早在17世紀初期，該國就由數百個王國、公主國、蘇丹國和部落統治著數千個島嶼。當荷蘭東印度公司的商人在1603年首次抵達印尼時，他們的目的僅僅是商業。然而，為了確保他們的商業利益並使股東的利潤最大化，荷蘭東印度公司商人開始對付當地收取虛高關稅的當地大官以及歐洲競爭對手。荷蘭東印度公司在商船上裝備了大砲；它招募了歐洲、日本、印度和印尼傭兵；並建起了堡壘以進行全面的戰鬥和攻城戰。這樣的企業對我們來說可能聽起來有點奇怪，但在近代初期，私人公司不僅僅雇傭士兵，還雇傭將軍和海軍上將、大炮和船隻，甚至還能整套購買軍隊。國際社會視之為理所當然，並沒有因為私人公司建立帝國而震驚不已。

Island after island fell to VOC mercenaries and a large part of Indonesia became a VOC colony. VOC ruled Indonesia for close to 200 years. Only in 1800 did the Dutch state assume control of Indonesia, making it a Dutch national colony for the following 150 years. Today some people warn that twenty-first-century corporations are accumulating too much power. Early modern history shows just how far that can go if businesses are allowed to pursue their self-interest unchecked.

While VOC operated in the Indian Ocean, the Dutch West Indies Company, or WIC, plied the Atlantic. In order to control trade on the important Hudson River, WIC built a settlement called New Amsterdam on an island at the river's mouth. The colony was threatened by Indians and repeatedly attacked by the British, who eventually captured it in 1664. The British changed its name to New York. The remains of the wall built by WIC to defend its colony against Indians and British are today paved over by the world's most famous street – Wall Street.

島嶼接連被荷屬東印度公司僱傭的傭兵所征服，印度尼西亞大部分地區成為荷屬東印度公司殖民地共約兩百年。荷蘭政府至1800年才掌握印度尼西亞的控制權，使之成為荷蘭國家殖民地長達一百五十年。現在，有人警告說二十一世紀的企業累積了過多的權力。早期現代史顯示出，如果企業被允許不受限制地追求自身利益，情況會變得多麼嚴

重。荷屬東印度公司在印度洋經營，而荷屬西印度公司則在大西洋經商。為了控制重要的哈德遜河貿易，荷屬西印度公司在河口島嶼上建立了一個名為新阿姆斯特丹的殖民地。殖民地曾受到印第安人的威脅並遭到英國人多次攻擊，最終於1664年被英國人俘虜，更名為紐約。荷屬西印度公司為了保衛殖民地免受印第安人和英國人的侵擾而建造的城垣，現在被全球最著名的華爾街所覆蓋。

As the seventeenth century wound to an end, complacency and costly continental wars caused the Dutch to lose not only New York, but also their place as Europe's financial and imperial engine. The vacancy was hotly contested by France and Britain. At first France seemed to be in a far stronger position. It was bigger than Britain, richer, more populous, and it possessed a larger and more experienced army. Yet Britain managed to win the trust of the financial system whereas France proved itself unworthy. The behaviour of the French crown was particularly notorious during what was called the Mississippi Bubble, the largest financial crisis of eighteenth-century Europe. That story also begins with an empire-building joint-stock company.

In 1717 the Mississippi Company, chartered in France, set out to colonise the lower Mississippi valley, establishing the city of New Orleans in the process. To finance its ambitious plans, the company, which had good connections at the court of King Louis XV, sold shares on the Paris stock exchange. John Law, the company's director, was also the governor of the central bank of France. Furthermore, the king had appointed him controller-general of finances, an office roughly equivalent to that of a modern finance minister. In 1717 the lower Mississippi valley offered few attractions besides swamps and alligators, yet the Mississippi Company spread tales of fabulous riches and boundless opportunities. French aristocrats, businessmen and the stolid members of the urban bourgeoisie fell for these fantasies, and Mississippi share prices skyrocketed. Initially, shares were offered at 500 livres apiece. On 1 August 1719, shares traded at 2,750 livres. By 30 August, they were worth 4,100 livres, and on 4 September, they reached 5,000 livres. On 2 December the price of a Mississippi share crossed the threshold of 10,000 livres. Euphoria swept the streets of Paris. People sold all their possessions and took huge loans in order to buy Mississippi shares. Everybody believed they'd discovered the easy way to riches.

隨著十七世紀接近尾聲，滿足感和昂貴的大陸戰爭導致荷蘭不僅失去了紐約，而且失去了作為歐洲金融和帝國引擎的地位。這個空缺由法國和英國爭奪。起初，法國似乎處於更強勢的地位。它比英國更大，更富有，人口更多，並且擁有更大和更有經驗的軍隊。然而，英國成功贏得了金融系統的信任，而法國被證明不是可靠的。法國王室的行為在所謂的密西西比泡沫期間尤其惡名昭彰，這是十八世紀歐洲最大的金融危機。那個故事也始於一家帝國主義的股份有限公司。1717年，法國特許經營的密西西比公司出發殖民下密西西比河谷，在此過程中建立了紐奧良市。為了融資其宏大計畫，這家擁有法國國王路易十五宮廷良好關係的公司，在巴黎證券交易所上市。該公司的董事長約翰·羅（John Law）也是法國中央銀行行長。此外，國王任命他為財政總監，這個職務大致相當於現代的財政部部長。1717年，下密西西比河谷除了沼澤和鱷魚外幾乎沒有什麼吸引力，但密西西比公司卻傳播著牛逼逼的財富和無限機會的傳聞。法國貴族、商人和城市中堅穩重的成員們都傾心於這些幻想，密西西比股票價格飛漲。最初，股票每股 500 盧布。1719 年 8 月 1 日，股票在 2,750 盧布交易。到 8 月 30 日，它們價值 4,100 盧布，而在 9 月 4 日，它們達到 5,000 盧布。在 12 月 2 日，密西西比股票的價格突破了 10,000 盧布的門檻。狂熱席捲巴黎街頭。人們賣掉了所有的財產，並借了巨額貸款以購買密西西比股票。每個人都認為他們發現了致富的捷徑。



39. New Amsterdam in 1660, at the tip of Manhattan Island. The settlement's protective wall is today paved over by Wall Street .

A few days later, the panic began. Some speculators realised that the share prices were totally unrealistic and unsustainable. They figured that they had better sell while stock prices were at their peak. As the supply of shares available rose, their price declined. When other investors saw the price going down, they also wanted to get out quick. The stock price plummeted further, setting off an avalanche. In order to stabilise prices, the central bank of France – at the direction of its governor, John Law – bought up Mississippi shares, but it could not do so for ever. Eventually it ran out of money. When this happened, the controller-general of finances, the same John Law, authorised the printing of more money in order to buy additional shares. This placed the entire French financial system inside the bubble. And not even this financial wizardry could save the day. The price of Mississippi shares dropped from 10,000 livres back to 1,000 livres, and then collapsed completely, and the shares lost every sou of their worth. By 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.

1660年，新阿姆斯特丹位於曼哈頓島的南端，而今天的華爾街正是當時防禦城牆所在地。幾天後，恐慌開始了。一些投資者意識到股票價格完全不現實和不可持續，他們認為最好在股票價格達到高峰時出售。隨著可供出售的股票供應量增加，股價下跌。當其他投資者看到價格下跌時，他們也想盡快退出。股票價格進一步暴跌，引發了雪崩效應。為了穩定股價，法國的中央銀行 - 在其總裁約翰·勞的指示下 - 買進了密西西比股票，但它不能一直這樣做。最終，它用盡了錢。當這種情況發生時，財政總監和同一人約翰·勞授權印刷更多貨幣以購買額外的股票。這使得整個法國金融系統陷入泡沫。即便是這種財務魔法也無法挽救情況。密西西比股票的價格從10,000法郎跌至1,000法郎，然後完全崩潰，股票失去了所有價值。現在，中央銀行和皇家財政擁有大量毫無價值的股票，卻沒有錢。大型投資者幾乎毫髮無傷 - 他們及時出售了。小投資者失去了一切，許多人自殺。

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.

密西西比泡沫是歷史上最壯觀的金融崩盤之一。皇家法國金融系統從這一打擊中從未完全恢復。密西西比公司利用其政治影響力操控股票

價格並煽動購買狂潮的方式，使公眾失去了對法國銀行系統和法國國王的金融智慧的信心。路易十五越來越難以籌集信貸。這成為法國海外帝國落入英國手中的主要原因之一。英國人可以輕易地且低利率地借貸，而法國卻很難獲得貸款，並且必須支付高利率。為了財政上的增長，法國國王借了越來越多的錢，並以越來越高的利率償還。最終，於18世紀80年代，繼承了祖父王位的路易十六意識到，他的一半年度預算被綁定在還債上，並且他正在步向破產。不情願地，於1789年，路易十六召集了大會，一個一個半世紀未召開的法國議會，以尋找解決危機的方法。這樣開始了法國大革命。

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 crown nationalise India along with the company's private army. Napoleon made fun of the British, calling them a nation of shopkeepers. Yet these shopkeepers defeated Napoleon himself, and their empire was the largest the world has ever seen.

在法國海外殖民帝國瓦解的同時，英國帝國正在迅速擴張。與之前的荷蘭帝國一樣，英國帝國主要是由位於倫敦證券交易所的私人股份有限公司建立和運營。早在十七世紀初期，像倫敦公司、普利茅斯公司、多切斯特公司和馬薩諸塞公司等股份有限公司就建立了英國在北美的第一個殖民地。印度次大陸也是通過英國東印度公司的僱傭軍征服的，而不是英國國家本身。這家公司表現甚至超過了荷蘭東印度公司。從倫敦的利登霍爾街總部，它在約一個世紀的時間裡統治著一個強大的印度帝國，維持著高達 35 萬名士兵的巨大軍隊，人數遠超英國

君主的武裝力量。直到 1858 年，英國王室才隨著公司的私人軍隊將印度國有化。拿破崙嘲笑英國人是一個商販的民族。然而這些商販打敗了拿破崙，他們的帝國是世界上最大的。

In the Name of Capital

The nationalisation of Indonesia by the Dutch crown (1800) and of India by the British crown (1858) hardly ended the embrace of capitalism and empire. On the contrary, the connection only grew stronger during the nineteenth century. Joint-stock companies no longer needed to establish and govern private colonies – their managers and large shareholders now pulled the strings of power in London, Amsterdam and Paris, and they could count on the state to look after their interests. As Marx and other social critics quipped, Western governments were becoming a capitalist trade union.

The most notorious example of how governments did the bidding of big money was the First Opium War, fought between Britain and China (1840–42). In the first half of the nineteenth century, the British East India Company and sundry British business people made fortunes by exporting drugs, particularly opium, to China. Millions of Chinese became addicts, debilitating the country both economically and socially. In the late 1830s the Chinese government issued a ban on drug trafficking, but British drug merchants simply ignored the law. Chinese authorities began to confiscate and destroy drug cargos. The drug cartels had close connections in Westminster and Downing Street – many MPs and Cabinet ministers in fact held stock in the drug companies – so they pressured the government to take action.

荷蘭皇冠於1800年國有化印度尼西亞，而英國皇冠於1858年國有化印度，但這並沒有結束資本主義和帝國的擁抱，相反，在19世紀，這種聯繫只變得更加緊密。聯合股份公司不再需要建立和統治私人殖民地，他們的經理和大股東現在在倫敦、阿姆斯特丹和巴黎牢牢掌握著權力的紐帶，他們可以依靠國家來照顧自己的利益。正如馬克思和其他社會評論家所說，西方政府正在成為一個資本主義的工會。最臭名昭著的例子就是中英鴉片戰爭（1840-42年），這場戰爭是英國和中國之間的戰爭。19世紀上半葉，英國東印度公司和其他英國商人通過向

中國出口藥品，特別是鴉片，賺了大錢。成千上萬的中國人成為了毒癮者，使中國在經濟和社會方面都受到了嚴重削弱。在19世紀30年代晚期，中國政府發布了一個禁止販運毒品的禁令，但是英國毒品商人卻完全無視了法律。中國當局開始沒收和摧毀毒品貨物。毒品卡特爾在威斯敏斯特和唐寧街有密切的關係，事實上，許多國會議員和內閣大臣都持有該毒品公司的股票，因此他們施壓政府採取行動。

In 1840 Britain duly declared war on China in the name of ‘free trade’. It was a walkover. The overconfident Chinese were no match for Britain’s new wonder weapons – steamboats, heavy artillery, rockets and rapid-fire rifles. Under the subsequent peace treaty, China agreed not to constrain the activities of British drug merchants and to compensate them for damages inflicted by the Chinese police. Furthermore, the British demanded and received control of Hong Kong, which they proceeded to use as a secure base for drug trafficking (Hong Kong remained in British hands until 1997). In the late nineteenth century, about 40 million Chinese, a tenth of the country’s population, were opium addicts.³

Egypt, too, learned to respect the long arm of British capitalism. During the nineteenth century, French and British investors lent huge sums to the rulers of Egypt, first in order to finance the Suez Canal project, and later to fund far less successful enterprises. Egyptian debt swelled, and European creditors increasingly meddled in Egyptian affairs. In 1881 Egyptian nationalists had had enough and rebelled. They declared a unilateral abrogation of all foreign debt. Queen Victoria was not amused. A year later she dispatched her army and navy to the Nile and Egypt remained a British protectorate until after World War Two.

1840年，英國以「自由貿易」之名正式向中國宣戰，且屢戰屢勝。自信過度的中國面對到英國新穎武器——蒸汽船、重砲、火箭和快速火槍等，殊死戰敗。在之後的和平條約中，中國同意不限制英國販毒商人的活動，並賠償中國警察所造成的損害。此外，英國還要求並獲得香港的控制權，並將其作為販毒的安全基地（香港直到1997年才交還給中國）。19世紀末，中國約有4000萬人，佔當時人口的十分之一，成為鴉片成癮者。同樣地，埃及也學會了尊重英國資本主義的長臂。19世紀期間，法國和英國的投資者向埃及統治者提供了巨額貸款，首先是為了資助蘇伊士運河的項目，後來則用於資助遠不如預期的企業。

埃及的債務膨脹，歐洲債權人越來越干預埃及事務。1881年，埃及民族主義者受夠了，開始反抗。他們宣布單方面取消所有外債。維多利亞女王不愉快了。一年後，她派遣軍隊和海軍到尼羅河，埃及一直保持英國的保護國地位，直到二戰後才結束。

These were hardly the only wars fought in the interests of investors. In fact, war itself could become a commodity, just like opium. In 1821 the Greeks rebelled against the Ottoman Empire. The uprising aroused great sympathy in liberal and romantic circles in Britain – Lord Byron, the poet, even went to Greece to fight alongside the insurgents. But London financiers saw an opportunity as well. They proposed to the rebel leaders the issue of tradable Greek Rebellion Bonds on the London stock exchange. The Greeks would promise to repay the bonds, plus interest, if and when they won their independence. Private investors bought bonds to make a profit, or out of sympathy for the Greek cause, or both. The value of Greek Rebellion Bonds rose and fell on the London stock exchange in tempo with military successes and failures on the battlefields of Hellas. The Turks gradually gained the upper hand. With a rebel defeat imminent, the bondholders faced the prospect of losing their trousers. The bondholders' interest was the national interest, so the British organised an international fleet that, in 1827, sank the main Ottoman flotilla in the Battle of Navarino. After centuries of subjugation, Greece was finally free. But freedom came with a huge debt that the new country had no way of repaying. The Greek economy was mortgaged to British creditors for decades to come.

這些戰爭並非為了投資者的利益所進行的唯一一場。事實上，戰爭本身也可以成為商品，就像鴉片一樣。1821年，希臘人反抗奧斯曼帝國。這次起義在英國的自由主義和浪漫主義圈子中引起了極大的同情。詩人拜倫勳爵甚至前往希臘與叛軍一起戰鬥。但倫敦金融家也看到了機會。他們向叛軍領袖建議在倫敦證券交易所發布可交易的希臘起義債券。如果希臘贏得獨立，他們就承諾償還債券本金加利息。私人投資者購買債券以獲利，或出於對希臘事業的同情，或兩者兼而有之。希臘起義債券的價值與希臘海盜戰爭的軍事勝利和失敗同步在倫敦證券交易所上漲和下跌。土耳其人逐漸佔上風。隨著叛軍失敗的局面已成定局，債券持有人面臨失去他們所有東西的前景。債券持有人的利益同時也是國家的利益，所以英國組織了一支國際艦隊，在1827年在瓦萊斯灣進行的拿瓦林諾戰役中沉沒了主要的奧斯曼船隊。經過數世

紀的壓迫，希臘終於獲得了解放。但自由來了，巨額債務也隨之而來，這個新國家沒有還款的辦法。希臘經濟被抵押給英國債權人幾十年。

The bear hug between capital and politics has had far-reaching implications for the credit market. The amount of credit in an economy is determined not only by purely economic factors such as the discovery of a new oil field or the invention of a new machine, but also by political events such as regime changes or more ambitious foreign policies. After the Battle of Navarino, British capitalists were more willing to invest their money in risky overseas deals. They had seen that if a foreign debtor refused to repay loans, Her Majesty's army would get their money back.

This is why today a country's credit rating is far more important to its economic well-being than are its natural resources. Credit ratings indicate the probability that a country will pay its debts. In addition to purely economic data, they take into account political, social and even cultural factors. An oil-rich country cursed with a despotic government, endemic warfare and a corrupt judicial system will usually receive a low credit rating. As a result, it is likely to remain relatively poor since it will not be able to raise the necessary capital to make the most of its oil bounty. A country devoid of natural resources, but which enjoys peace, a fair judicial system and a free government is likely to receive a high credit rating. As such, it may be able to raise enough cheap capital to support a good education system and foster a flourishing high-tech industry.

資本和政治的熊抱對信貸市場產生了深遠的影響。一個經濟中的信貸數量不僅由純經濟因素如發現新油田或新機器的發明所決定，還受政治事件如政權更迭或更大膽的對外政策的影響。在納瓦林海戰之後，英國資本家更願意投資於風險較高的海外交易。他們看到如果國外債務人拒絕還款，女王的軍隊將會拿回他們的錢。這就是為什麼今天一個國家的信用評級對其經濟福祉來說比其自然資源還要重要。信用評級表明了一個國家付債務的概率。除了純經濟數據外，它們還考慮了政治、社會甚至文化因素。一個被腐敗的政權、內戰和腐敗司法體系所困擾的油資源豐富的國家通常會收到較低的信用評級。因此，它可能會保持相對貧困，因為它將無法籌集必要的資本來充分利用其豐沛的石油資源。一個沒有自然資源，但享有和平、公正司法體系和自由

政府的國家可能會收到較高的信用評級。因此，它可能能夠籌集足夠的廉價資本來支持良好的教育系統並促進繁榮的高科技產業。

The Cult of the Free Market

Capital and politics influence each other to such an extent that their relations are hotly debated by economists, politicians and the general public alike. Ardent capitalists tend to argue that capital should be free to influence politics, but politics should not be allowed to influence capital. They argue that when governments interfere in the markets, political interests cause them to make unwise investments that result in slower growth. For example, a government may impose heavy taxation on industrialists and use the money to give lavish unemployment benefits, which are popular with voters. In the view of many business people, it would be far better if the government left the money with them. They would use it, they claim, to open new factories and hire the unemployed.

資本與政治互相影響，其關係被經濟學家、政治家和公眾熱烈討論。熱情的資本主義者往往主張資本應該自由地影響政治，但政治不應該影響資本。他們認為，當政府干預市場時，政治利益會導致他們做出不明智的投資，從而導致經濟增長放緩。例如，政府可能對工業家徵收重稅，並用這些錢來提供豐厚的失業救濟金，這深受選民歡迎。在許多商人看來，如果政府把錢留給他們，會更好。他們聲稱會利用這些錢來開設新工廠，雇用失業者。

In this view, the wisest economic policy is to keep politics out of the economy, reduce taxation and government regulation to a minimum, and allow market forces free rein to take their course. Private investors, unencumbered by political considerations, will invest their money where they can get the most profit, so the way to ensure the most economic growth – which will benefit everyone, industrialists and workers – is for the government to do as little as possible. This free-market doctrine is today the most common and influential variant of the capitalist creed. The most enthusiastic advocates of the free market criticise military adventures abroad with as much zeal as welfare programmes at home. They offer governments the same advice that Zen masters offer initiates: just do nothing.

以此觀點來看，最明智的經濟政策是將政治排除於經濟之外，將稅收和政府管制減少到最低限度，並允許市場力量自由運作。私人投資者可以在沒有政治考量的情況下將他們的錢投資在能夠獲得最大利潤的地方，所以確保最大的經濟成長（這將惠及所有人，包括工業家和工人）的方法就是讓政府盡可能少做事。這種自由市場主義學說是當今最常見和最有影響力的資本主義信條變種。最熱情的自由市場的擁護者和他們在國內發起的福利計劃一樣，同樣熱烈地批評了國外的軍事冒險。他們為政府提供的建議就像禪師給入門弟子的建議一樣：什麼也不要做。

But in its extreme form, belief in the free market is as naïve as belief in Santa Claus. There simply is no such thing as a market free of all political bias. The most important economic resource is trust in the future, and this resource is constantly threatened by thieves and charlatans. Markets by themselves offer no protection against fraud, theft and violence. It is the job of political systems to ensure trust by legislating sanctions against cheats and to establish and support police forces, courts and jails which will enforce the law. When kings fail to do their jobs and regulate the markets properly, it leads to loss of trust, dwindling credit and economic depression. That was the lesson taught by the Mississippi Bubble of 1719, and anyone who forgot it was reminded by the US housing bubble of 2007, and the ensuing credit crunch and recession.

相信自由市場的極端形式和相信聖誕老人一樣天真。沒有不帶任何政治偏見的自由市場。最重要的經濟資源是對未來的信任，但這種資源經常受到盜賊和江湖騙子的威脅。市場本身無法防範欺詐、盜竊和暴力。其職責是通過立法制裁作弊者，建立和支持警察力量、法院和監獄來執行法律，以確保信任。當國王未能履行其職責，適當監管市場時，將導致失去信任、信貸減少和經濟衰退。這是1719年密西西比泡沫的教訓，忘記這一點的人將在2007年的美國房地產泡沫以及隨之而來的信貸緊縮和經濟衰退中受到提醒。

The Capitalist Hell

There is an even more fundamental reason why it's dangerous to give markets a completely free rein. Adam Smith taught that the shoemaker would use his

surplus to employ more assistants. This implies that egoistic greed is beneficial for all, since profits are utilised to expand production and hire more employees.

Yet what happens if the greedy shoemaker increases his profits by paying employees less and increasing their work hours? The standard answer is that the free market would protect the employees. If our shoemaker pays too little and demands too much, the best employees would naturally abandon him and go to work for his competitors. The tyrant shoemaker would find himself left with the worst labourers, or with no labourers at all. He would have to mend his ways or go out of business. His own greed would compel him to treat his employees well.

完全放任市場給予的危險更深層次。亞當·斯密曾經教導過，鞋匠應該使用自己的盈餘來聘請更多的助手。這暗示自私的貪婪對所有人有益，由於利潤被用於擴大生產和聘請更多員工。然而，如果貪婪的鞋匠通過減少員工薪資和增加工作時間來增加利潤，那會發生什麼？標準答案是自由市場會保護員工。如果我們的鞋匠支付太少，要求太高，那麼最優秀的員工自然會離開他，轉而到他的競爭對手工作。暴君鞋匠會發現自己剩下了最差勞工，或者根本沒有勞工。他必須改過自新，否則就要破產。他自己的貪婪會強迫他善待員工。

This sounds bulletproof in theory, but in practice the bullets get through all too easily. In a completely free market, unsupervised by kings and priests, avaricious capitalists can establish monopolies or collude against their workforces. If there is a single corporation controlling all shoe factories in a country, or if all factory owners conspire to reduce wages simultaneously, then the labourers are no longer able to protect themselves by switching jobs.

Even worse, greedy bosses might curtail the workers' freedom of movement through debt peonage or slavery. At the end of the Middle Ages, slavery was almost unknown in Christian Europe. During the early modern period, the rise of European capitalism went hand in hand with the rise of the Atlantic slave trade. Unrestrained market forces, rather than tyrannical kings or racist ideologues, were responsible for this calamity.

這在理論上聽起來很強大，但在實際應用中，子彈很容易穿透。在完全自由市場的情況下，沒有國王和祭司的監督，貪婪的資本家可以建立壟斷或共謀對付他們的勞動力。如果一家公司在一個國家中控制所有鞋廠，或者如果所有工廠老板密謀同時降低工資，那麼勞工將無法通過轉換工作來保護自己。更糟糕的是，貪婪的老板可能通過負債奴隸制或奴隸制度限制工人的自由流動。在中世紀末期，基督教歐洲幾乎不知道奴隸制度。在近代早期，歐洲資本主義的崛起與大西洋奴隸貿易的崛起密不可分。這場災難的責任並不是暴君國王或種族主義者，而是不受限制的市場力量。

When the Europeans conquered America, they opened gold and silver mines and established sugar, tobacco and cotton plantations. These mines and plantations became the mainstay of American production and export. The sugar plantations were particularly important. In the Middle Ages, sugar was a rare luxury in Europe. It was imported from the Middle East at prohibitive prices and used sparingly as a secret ingredient in delicacies and snake-oil medicines. After large sugar plantations were established in America, ever-increasing amounts of sugar began to reach Europe. The price of sugar dropped and Europe developed an insatiable sweet tooth. Entrepreneurs met this need by producing huge quantities of sweets: cakes, cookies, chocolate, candy, and sweetened beverages such as cocoa, coffee and tea. The annual sugar intake of the average Englishman rose from near zero in the early seventeenth century to around eight kilograms in the early nineteenth century.

當歐洲人征服美洲時，他們開設了黃金和銀礦，建立了甘蔗、煙草和棉花種植園。這些礦山和種植園成為美國生產和出口的支柱。甘蔗種植園尤其重要。中世紀時，糖在歐洲是一種罕見的奢侈品。其以高昂的價格從中東進口，只用於美食和蛇油藥品的秘密成分。在美國建立了大型甘蔗種植園後，越來越多的糖開始運抵歐洲。糖的價格下降，歐洲人發展出了一種無法滿足的甜牙。企業家通過生產大量的糖果來滿足這種需求：蛋糕、曲奇餅、巧克力、糖果和添加糖的飲料，如可可、咖啡和茶。普通英國人的年糖攝入量從十七世紀初幾乎為零，到十九世紀初約為八公斤。

However, growing cane and extracting its sugar was a labour-intensive business. Few people wanted to work long hours in malaria-infested sugar fields under a tropical sun. Contract labourers would have produced a

commodity too expensive for mass consumption. Sensitive to market forces, and greedy for profits and economic growth, European plantation owners switched to slaves.

From the sixteenth to the nineteenth centuries, about 10 million African slaves were imported to America. About 70 per cent of them worked on the sugar plantations. Labour conditions were abominable. Most slaves lived a short and miserable life, and millions more died during wars waged to capture slaves or during the long voyage from inner Africa to the shores of America. All this so that Europeans could enjoy their sweet tea and candy – and sugar barons could enjoy huge profits.

然而，種植蔗薯並提取其糖分是一項勞動密集型的工作。很少有人願意在瘧疾肆虐的糖田裡長時間工作，承受烈日炎炎的折磨。僱用合同工會使生產的商品價格過高，無法被大眾消費。為了迎合市場需求，為了謀取更多利潤和經濟發展，歐洲植園主們最終轉向奴隸制度。從16世紀到19世紀，大約有1000萬名非洲奴隸被引進美洲，其中約70%在糖田工作。勞動條件非常惡劣，大多數奴隸的生命短暫且悲慘，無數奴隸在從內陸非洲到美洲海岸的漫長航程中或被俘虜戰爭中喪生。所有這些都為了讓歐洲人享受他們的甜茶和糖果，讓糖業巨頭獲得巨大的利潤。

The slave trade was not controlled by any state or government. It was a purely economic enterprise, organised and financed by the free market according to the laws of supply and demand. Private slave-trading companies sold shares on the Amsterdam, London and Paris stock exchanges. Middle-class Europeans looking for a good investment bought these shares. Relying on this money, the companies bought ships, hired sailors and soldiers, purchased slaves in Africa, and transported them to America. There they sold the slaves to the plantation owners, using the proceeds to purchase plantation products such as sugar, cocoa, coffee, tobacco, cotton and rum. They returned to Europe, sold the sugar and cotton for a good price, and then sailed to Africa to begin another round. The shareholders were very pleased with this arrangement. Throughout the eighteenth century the yield on slave-trade investments was about 6 per cent a year – they were extremely profitable, as any modern consultant would be quick to admit.

奴隸貿易並非由任何國家或政府控制。這是一個純經濟的企業，根據供需法則由自由市場組織和融資。私人奴隸貿易公司在阿姆斯特丹、倫敦和巴黎證券交易所出售股份。尋求良好投資的中產階級歐洲人購買這些股份。公司依靠這些資金購買船隻、雇用水手和士兵、在非洲購買奴隸並將他們運送到美洲。在那裡，他們將奴隸出售給種植園主，用所得款項購買種植園產品，如糖、可可、咖啡、煙草、棉花和蘭姆酒。他們返回歐洲，以很好的價格出售糖和棉花，然後航行到非洲開始另一個循環。股東們對這安排非常滿意。整個18世紀，奴隸貿易投資的收益率約為每年6%，非常賺錢，任何現代顧問都會迅速承認。

This is the fly in the ointment of free-market capitalism. It cannot ensure that profits are gained in a fair way, or distributed in a fair manner. On the contrary, the craving to increase profits and production blinds people to anything that might stand in the way. When growth becomes a supreme good, unrestricted by any other ethical considerations, it can easily lead to catastrophe. Some religions, such as Christianity and Nazism, have killed millions out of burning hatred. Capitalism has killed millions out of cold indifference coupled with greed. The Atlantic slave trade did not stem from racist hatred towards Africans. The individuals who bought the shares, the brokers who sold them, and the managers of the slave-trade companies rarely thought about the Africans. Nor did the owners of the sugar plantations. Many owners lived far from their plantations, and the only information they demanded were neat ledgers of profits and losses.

這是自由市場資本主義裡的一個難題。它無法保證獲利的公平性和公正的分配方式。相反地，在追求獲利和生產的渴求下，人們忽視任何可能阻礙這一過程的因素。當成長成為終極目標，且無限制地達成任何其他倫理考量時，它很容易導致災難。有些宗教，例如基督教和納粹主義，因為燃燒的仇恨殺害了數百萬人。資本主義因著冷酷的漠不關心和貪婪也殺害了數百萬人。大西洋奴隸貿易不是發源於對非洲人的種族仇恨。買賣股票的人、賣方經紀人和奴隸貿易公司的經理很少想到非洲人。還有，糖廠的東主也不會想到。很多東主住在距離他們的糖廠很遠的地方，他們只會要求整潔的盈虧帳冊。

It is important to remember that the Atlantic slave trade was not a single aberration in an otherwise spotless record. The Great Bengal Famine,

discussed in the previous chapter, was caused by a similar dynamic – the British East India Company cared more about its profits than about the lives of 10 million Bengalis. VOC's military campaigns in Indonesia were financed by upstanding Dutch burghers who loved their children, gave to charity, and enjoyed good music and fine art, but had no regard for the suffering of the inhabitants of Java, Sumatra and Malacca. Countless other crimes and misdemeanours accompanied the growth of the modern economy in other parts of the planet.

The nineteenth century brought no improvement in the ethics of capitalism. The Industrial Revolution that swept through Europe enriched the bankers and capital-owners, but condemned millions of workers to a life of abject poverty. In the European colonies things were even worse. In 1876, King Leopold II of Belgium set up a nongovernmental humanitarian organisation with the declared aim of exploring Central Africa and fighting the slave trade along the Congo River. It was also charged with improving conditions for the inhabitants of the region by building roads, schools and hospitals. In 1885 the European powers agreed to give this organisation control of 2.3 million square kilometres in the Congo basin. This territory, seventy-five times the size of Belgium, was henceforth known as the Congo Free State. Nobody asked the opinion of the territory's 20–30 million inhabitants.

重要的是要記住，大西洋奴隸貿易並不是唯一的異常，而其他地方也存在著同樣的問題。如上一章中所討論的大孟加拉饑荒，就是由類似的動態所引起—英國東印度公司更關心其利潤，而非孟加拉的1千萬人民生命。荷蘭荷屬東印度公司的印尼軍事行動是由高尚的荷蘭市民資助的，他們愛護自己的孩子，慷慨捐獻，喜愛音樂和藝術，但對爪哇、蘇門答臘和馬六甲的居民所受的苦難卻毫不在意。隨著現代經濟的發展，在地球的其他地方也發生了無數的罪行和不法行為。19世紀並未改進資本主義倫理。席捲歐洲的工業革命使銀行家和資本所有者獲得了豐富的利益，但卻使數百萬勞工陷入赤貧生活。在歐洲殖民地，情況更為惡化。1876年，比利時的利奧波德二世國王成立了一個非政府人道主義組織，旨在探索中非和打擊剛果河河畔的奴隸貿易。此外，它還負責修建道路、學校和醫院，改善該地區居民的生活環境。1885年，歐洲列強同意讓這一組織控制剛果盆地230萬平方公里的土地。這片土地是比利時的75倍大小，後來被稱為剛果自由邦。然而，沒有人問過其2000-3000萬居民的意見。

Within a short time the humanitarian organisation became a business enterprise whose real aim was growth and profit. The schools and hospitals were forgotten, and the Congo basin was instead filled with mines and plantations, run by mostly Belgian officials who ruthlessly exploited the local population. The rubber industry was particularly notorious. Rubber was fast becoming an industrial staple, and rubber export was the Congo's most important source of income. The African villagers who collected the rubber were required to provide higher and higher quotas. Those who failed to deliver their quota were punished brutally for their 'laziness'. Their arms were chopped off and occasionally entire villages were massacred.

According to the most moderate estimates, between 1885 and 1908 the pursuit of growth and profits cost the lives of 6 million individuals (at least 20 per cent of the Congo's population). Some estimates reach up to 10 million deaths.⁴

短短時間內，這個人道主義組織變成了一家追求成長和利潤的企業。學校和醫院被遺忘了，剛果盆地反倒充滿了礦山和種植園，由大多數是比利時官員無情地剝削當地人口。橡膠工業尤其臭名昭著。橡膠正迅速成為一種重要的工業材料，而橡膠出口則是剛果最重要的收入來源。收集橡膠的非洲村民必須提供越來越高的配額。未能達到配額的人會因“懶惰”而受到殘酷的懲罰。他們的手臂被砍掉，有時整個村莊會被屠殺。根據最為保守的估算，自1885年至1908年，追求成長和利潤導致了600萬人的死亡（至少佔剛果人口的20%）。一些估算認為死亡人數高達1000萬。

After 1908, and especially after 1945, capitalist greed was somewhat reined in, not least due to the fear of Communism. Yet inequities are still rampant. The economic pie of 2014 is far larger than the pie of 1500, but it is distributed so unevenly that many African peasants and Indonesian labourers return home after a hard day's work with less food than did their ancestors 500 years ago. Much like the Agricultural Revolution, so too the growth of the modern economy might turn out to be a colossal fraud. The human species and the global economy may well keep growing, but many more individuals may live in hunger and want.

Capitalism has two answers to this criticism. First, capitalism has created a world that nobody but a capitalist is capable of running. The only serious

attempt to manage the world differently – Communism – was so much worse in almost every conceivable way that nobody has the stomach to try again. In 8500 BC one could cry bitter tears over the Agricultural Revolution, but it was too late to give up agriculture. Similarly, we may not like capitalism, but we cannot live without it.

1908年以后，特别是1945年以后，由于对共产主义的恐惧，资本主义的贪欲得到了一定程度的遏制。然而，不公平现象仍然猖獗。2014年的经济蛋糕远比1500年时的蛋糕更大，但分配却如此不均，以至于许多非洲农民和印度尼西亚劳工在辛苦一天后回家，他们比500年前的祖先更少食物。与农业革命类似，现代经济的增长也可能会变成一场巨大的欺骗。人类和全球经济可能会继续增长，但更多的人可能会挨饿和苦难。对于这种批评，资本主义有两个答案。首先，资本主义创造了一个除了资本家以外没有人能够掌控的世界。唯一一次认真尝试以不同方式管理世界的尝试 - 共产主义 - 在几乎所有方面都更糟糕，以至于没有人再愿意尝试。公元前8500年，人们可能会因农业革命而痛苦欲绝，但已经太迟放弃农业。同样，我们可能不喜欢资本主义，但不能没有它。

The second answer is that we just need more patience – paradise, the capitalists promise, is right around the corner. True, mistakes have been made, such as the Atlantic slave trade and the exploitation of the European working class. But we have learned our lesson, and if we just wait a little longer and allow the pie to grow a little bigger, everybody will receive a fatter slice. The division of spoils will never be equitable, but there will be enough to satisfy every man, woman and child – even in the Congo.

There are, indeed, some positive signs. At least when we use purely material criteria – such as life expectancy, child mortality and calorie intake – the standard of living of the average human in 2014 is significantly higher than it was in 1914, despite the exponential growth in the number of humans.

第二個答案是，我們需要更多的耐心。資本家承諾，天堂就在轉角處。確實，犯了一些錯誤，例如大西洋奴隸貿易和剝削歐洲工人階級。但是，我們已經吸取了教訓，如果我們再等待一會兒，讓餅變得更大一些，每個人都能得到更豐厚的一份。贓物的分配永遠不會是公平的，但每個人，甚至在剛果，都會有足夠的東西滿足他們的需要。

事實上，有一些積極的跡象。至少，當我們使用純粹的物質標準（例如壽命，兒童死亡率和卡路里攝入量）時，2014年平均人類的生活水平比1914年顯著提高，儘管人類的數量呈指數級增長。

Yet can the economic pie grow indefinitely? Every pie requires raw materials and energy. Prophets of doom warn that sooner or later *Homo sapiens* will exhaust the raw materials and energy of planet Earth. And what will happen then?

經濟蛋糕能夠無限增長嗎？每個蛋糕都需要原材料和能源。悲觀主義者警告說，遲早人類會消耗地球的原材料和能源。那麼，接下來會發生什麼？

The Wheels of Industry

THE MODERN ECONOMY GROWS THANKS to our trust in the future and to the willingness of capitalists to reinvest their profits in production. Yet that does not suffice. Economic growth also requires energy and raw materials, and these are finite. When and if they run out, the entire system will collapse.

But the evidence provided by the past is that they are finite only in theory. Counter-intuitively, while humankind's use of energy and raw materials has mushroomed in the last few centuries, the amounts available for our exploitation have actually *increased*. Whenever a shortage of either has threatened to slow economic growth, investments have flowed into scientific and technological research. These have invariably produced not only more efficient ways of exploiting existing resources, but also completely new types of energy and materials.

現代經濟增長的原因是我們對未來的信任以及資本家願意重新投資他們的利潤以促進生產。但這並不足夠。經濟增長還需要能源和原材料，而這些是有限的。一旦它們用盡，整個系統將崩潰。但過去提供的證據表明，它們只是理論上有限。出人意料的是，雖然人類在過去幾個世紀中使用能源和原材料的量激增，可供開發的數量實際上卻增加了。每當能源或原材料的短缺威脅到經濟增長時，投資便湧入科學和技術研究中。這些研究總是產生出不僅是更有效利用現有資源的方法，還有全新的能源和材料。

Consider the vehicle industry. Over the last 300 years, humankind has manufactured billions of vehicles – from carts and wheelbarrows, to trains, cars, supersonic jets and space shuttles. One might have expected that such a prodigious effort would have exhausted the energy sources and raw materials available for vehicle production, and that today we would be scraping the

bottom of the barrel. Yet the opposite is the case. Whereas in 1700 the global vehicle industry relied overwhelmingly on wood and iron, today it has at its disposal a cornucopia of new-found materials such as plastic, rubber, aluminium and titanium, none of which our ancestors even knew about. Whereas in 1700 carts were built mainly by the muscle power of carpenters and smiths, today the machines in Toyota and Boeing factories are powered by petroleum combustion engines and nuclear power stations. A similar revolution has swept almost all other fields of industry. We call it the Industrial Revolution.

考慮車輛行業。在過去的 300 年中，人類已經製造了數十億輛車輛 - 從手推車和獨輪車到火車、汽車、超音速飛機和太空梭。人們可能會期望這樣的巨大努力會耗盡車輛製造所需的能源和原材料，我們今天將會用盡所有資源。然而事實卻相反。在 1700 年，全球車輛工業主要依賴的是木材和鐵，而今天它擁有眾多新發現的材料，如塑料、橡膠、鋁和鈦等，這些材料我們的祖先甚至都不知道。在 1700 年，手推車主要靠木匠和鐵匠的力量來建造，而今天豐田和波音工廠中的機器都是由石油燃燒引擎和核電站提供動力的。類似的革命也席捲了幾乎所有其他工業領域。我們稱之為工業革命。

For millennia prior to the Industrial Revolution, humans already knew how to make use of a large variety of energy sources. They burned wood in order to smelt iron, heat houses and bake cakes. Sailing ships harnessed wind power to move around, and watermills captured the flow of rivers to grind grain. Yet all these had clear limits and problems. Trees were not available everywhere, the wind didn't always blow when you needed it, and water power was only useful if you lived near a river.

An even bigger problem was that people didn't know how to convert one type of energy into another. They could harness the movement of wind and water to sail ships and push millstones, but not to heat water or smelt iron. Conversely, they could not use the heat energy produced by burning wood to make a millstone move. Humans had only one machine capable of performing such energy conversion tricks: the body. In the natural process of metabolism, the bodies of humans and other animals burn organic fuels known as food and convert the released energy into the movement of muscles. Men, women and

beasts could consume grain and meat, burn up their carbohydrates and fats, and use the energy to haul a rickshaw or pull a plough.

在工業革命前的千年裡，人類已經掌握了使用各種能源的方法。他們燃燒木材熔鐵、取暖和烘烤蛋糕。帆船利用風力航行，水車利用河流流動磨碎穀物。然而，這些都有明顯的限制和問題。樹木不是到處都有，風力不一定在需要時吹，而水力只有在你生活在河邊時才有用。更大的問題是人們不知道如何將一種形式的能源轉換為另一種。他們可以利用風和水的運動來帶動船只和推動磨石，但不能用它們來加熱水或熔鐵。反之，他們也不能使用燃燒木材產生的熱能來使磨石運轉。人類只有一種能進行這種能量轉換的機器：身體。在新陳代謝的自然過程中，人類和其他動物的身體燃燒有機燃料，即食物，將釋放的能量轉化為肌肉運動。男人、女人和畜牲可以消耗穀物和肉類，燃燒它們的碳水化合物和脂肪，利用能量拉人力車或拉犁。

Since human and animal bodies were the only energy conversion device available, muscle power was the key to almost all human activities. Human muscles built carts and houses, ox muscles ploughed fields, and horse muscles transported goods. The energy that fuelled these organic muscle-machines came ultimately from a single source – plants. Plants in their turn obtained their energy from the sun. By the process of photosynthesis, they captured solar energy and packed it into organic compounds. Almost everything people did throughout history was fuelled by solar energy that was captured by plants and converted into muscle power.

Human history was consequently dominated by two main cycles: the growth cycles of plants and the changing cycles of solar energy (day and night, summer and winter). When sunlight was scarce and when wheat fields were still green, humans had little energy. Granaries were empty, tax collectors were idle, soldiers found it difficult to move and fight, and kings tended to keep the peace. When the sun shone brightly and the wheat ripened, peasants harvested the crops and filled the granaries. Tax collectors hurried to take their share. Soldiers flexed their muscles and sharpened their swords. Kings convened councils and planned their next campaigns. Everyone was fuelled by solar energy – captured and packaged in wheat, rice and potatoes.

由於人類和動物身體是唯一可用的能量轉換裝置，肌肉力量幾乎是所有人類活動的關鍵。人類肌肉建造了手推車和房屋，牛肌肉犁田，馬肌肉運輸貨物。駕馭這些有機肌肉機器的能量最終來自單一來源 - 植物。植物反過來獲取它們的能量來源於太陽。通過光合作用，它們捕捉太陽能並將其填充到有機化合物中。幾乎人類歷史上所有的事情都是靠植物捕捉並轉換為肌肉力量的太陽能來推動的。因此，人類歷史主要由兩個周期所主宰：植物的生長週期和太陽能的變化週期（白天和黑夜、夏季和冬季）。當陽光稀少，小麥田仍然是綠色的時候，人們沒有多少能量。倉庫空空如也，稅收徵收人員閒置，士兵難以移動和戰鬥，國王傾向於保持和平。當陽光燦爛且小麥成熟時，農民收割作物並填滿倉庫。稅收徵收人員匆忙取走他們的份額。士兵屈肌肉，磨利劍。國王召集會議，計劃下一次戰役。每個人都受到太陽能的推動 - 捕捉並包裝在小麥、米和馬鈴薯中。

The Secret in the Kitchen

Throughout these long millennia, day in and day out, people stood face to face with the most important invention in the history of energy production – and failed to notice it. It stared them in the eye every time a housewife or servant put up a kettle to boil water for tea or put a pot full of potatoes on the stove. The minute the water boiled, the lid of the kettle or the pot jumped. Heat was being converted to movement. But jumping pot lids were an annoyance, especially if you forgot the pot on the stove and the water boiled over. Nobody saw their real potential.

A partial breakthrough in converting heat into movement followed the invention of gunpowder in ninth-century China. At first, the idea of using gunpowder to propel projectiles was so counter-intuitive that for centuries gunpowder was used primarily to produce fire bombs. But eventually – perhaps after some bomb expert ground gunpowder in a mortar only to have the pestle shoot out with force – guns made their appearance. About 600 years passed between the invention of gunpowder and the development of effective artillery.

有千年之久，日復一日，人們一直面對著一項能源生產史上最重要的發明——卻沒有注意到它。每當一位主婦或僕人往爐子上放上茶壺或

裝滿馬鈴薯的鍋子，熱水開沸時，壺蓋或鍋蓋吱吱跳動。熱能轉化為運動能。但跳動的壺蓋是一種煩惱，特別是如果你將鍋子遺忘在爐子上，水熬乾了。沒有人看到它們的真正潛力。將熱能轉化為運動能的部分突破是在九世紀中國發明火藥後出現的。起初，利用火藥推動投射物的想法是如此直觀反感，以至于幾個世紀以來，在使用火藥製造火焰彈的過程中。但最終——也許是某個炸彈專家用研鉢磨碎火藥時，研棒突然強行彈出——槍械出現了。在火藥發明和有效的炮兵發展之間，大約有600年的時間。

Even then, the idea of converting heat into motion remained so counter-intuitive that another three centuries went by before people invented the next machine that used heat to move things around. The new technology was born in British coal mines. As the British population swelled, forests were cut down to fuel the growing economy and make way for houses and fields. Britain suffered from an increasing shortage of firewood. It began burning coal as a substitute. Many coal seams were located in waterlogged areas, and flooding prevented miners from accessing the lower strata of the mines. It was a problem looking for a solution. Around 1700, a strange noise began reverberating around British mineshafts. That noise – harbinger of the Industrial Revolution – was subtle at first, but it grew louder and louder with each passing decade until it enveloped the entire world in a deafening cacophony. It emanated from a steam engine.

即便如此，將熱能轉換為動力的想法依然那麼不合常規，以致於又過了三個世紀，人們才發明了下一個利用熱能移動物體的機器。這項新技術誕生在英國的煤礦之中。隨著英國人口的增長，林木被砍伐來燃料蓬勃發展的經濟和為房屋和農田讓路。英國因為火柴的短缺而受苦。他們開始使用煤作為替代品。許多煤層位於水淹區，洪水阻礙了礦工深入開採。這是一個需要解決的問題。約在1700年左右，一種奇怪的聲音開始在英國的礦井中回響。那個聲音——工業革命的先驅——起初微不足道，但隨著每一個十年的過去，它變得越來越響亮，直到它以震耳欲聾的嘈雜聲籠罩了整個世界。它來自一台蒸汽機。

There are many types of steam engines, but they all share one common principle. You burn some kind of fuel, such as coal, and use the resulting heat to boil water, producing steam. As the steam expands it pushes a piston. The piston moves, and anything that is connected to the piston moves with it. You

have converted heat into movement! In eighteenth-century British coal mines, the piston was connected to a pump that extracted water from the bottom of the mineshafts. The earliest engines were incredibly inefficient. You needed to burn a huge load of coal in order to pump out even a tiny amount of water. But in the mines coal was plentiful and close at hand, so nobody cared.

In the decades that followed, British entrepreneurs improved the efficiency of the steam engine, brought it out of the mineshafts, and connected it to looms and gins. This revolutionised textile production, making it possible to produce ever-larger quantities of cheap textiles. In the blink of an eye, Britain became the workshop of the world. But even more importantly, getting the steam engine out of the mines broke an important psychological barrier. If you could burn coal in order to move textile looms, why not use the same method to move other things, such as vehicles?

蒸汽引擎有許多類型，但它們都有一個共同的原理。你燃燒某種燃料，例如煤，並利用產生的熱量煮沸水，產生蒸汽。當蒸汽膨脹時，它會推動活塞。活塞移動，與之相連接的任何物體也隨之移動。你已經將熱能轉化為運動！在18世紀的英國煤礦中，活塞連接到一個泵，它可以從礦井底部抽出水。最早的蒸汽引擎效率極低。即使は幾乎沒有抽水量，也需要燃燒大量煤炭。但在礦井中，煤炭豐富且近在咫尺，因此沒有人在意。隨著時間的推移，英國企業家提高了蒸汽引擎的效率，將其從礦井中帶出來，並連接到紡織機和織布機。這革命性地改變了紡織生產，使得生產更多的廉價紡織品成為可能。一眨眼間，英國成為了世界工廠。但更重要的是，將蒸汽引擎從礦井中帶出來打破了一個重要的心理障礙。如果你可以燃燒煤炭來驅動紡織機器，為什麼不使用相同的方法來移動其他東西，例如車輛？

In 1825, a British engineer connected a steam engine to a train of mine wagons full of coal. The engine drew the wagons along an iron rail some twenty kilometres long from the mine to the nearest harbour. This was the first steam-powered locomotive in history. Clearly, if steam could be used to transport coal, why not other goods? And why not even people? On 15 September 1830, the first commercial railway line was opened, connecting Liverpool with Manchester. The trains moved under the same steam power that had previously pumped water and moved textile looms. A mere twenty years later, Britain had tens of thousands of kilometres of railway tracks. [1](#)

Henceforth, people became obsessed with the idea that machines and engines could be used to convert one type of energy into another. Any type of energy, anywhere in the world, might be harnessed to whatever need we had, if we could just invent the right machine. For example, when physicists realised that an immense amount of energy is stored within atoms, they immediately started thinking about how this energy could be released and used to make electricity, power submarines and annihilate cities. Six hundred years passed between the moment Chinese alchemists discovered gunpowder and the moment Turkish cannon pulverised the walls of Constantinople. Only forty years passed between the moment Einstein determined that any kind of mass could be converted into energy – that's what $E = mc^2$ means – and the moment atom bombs obliterated Hiroshima and Nagasaki and nuclear power stations mushroomed all over the globe.

1825年，一位英國工程師將蒸汽機連接到一列裝滿煤的礦車列車上。這列火車沿著約二十公里長的鐵軌從礦區連接至最近的港口。這是世界上第一列使用蒸汽動力的火車。顯然，如果蒸汽可以用於運輸煤炭，為什麼不能運輸其他貨物？甚至人類本身？1830年9月15日，第一條商業鐵路線開通，將利物浦與曼徹斯特連接起來。這些火車的動力與之前用於抽水和帶動紡織機的蒸汽力一樣。僅僅二十年後，英國就有幾萬公里的鐵路軌道。從此，人們著迷於將機器和引擎用於將一種能源轉化為另一種。只要我們能夠發明出合適的機器，任何地方、任何型態的能源都可以被利用到我們需要的地方。例如，物理學家們發現原子內蘊藏著極大的能量之後，他們立刻開始思考如何釋放這種能量，用於發電、推動潛艇或消滅城市。距離中國煉丹術士發現火藥已經六百年，而距離愛因斯坦確定任何質量都可以轉化為能量——這就是 $E=mc^2$ 的意思——以及原子彈摧毀廣島和長崎以及全球各地的核電站興建只有四十年。

Another crucial discovery was the internal combustion engine, which took little more than a generation to revolutionise human transportation and turn petroleum into liquid political power. Petroleum had been known for thousands of years, and was used to waterproof roofs and lubricate axles. Yet until just a century ago nobody thought it was useful for much more than that. The idea of spilling blood for the sake of oil would have seemed ludicrous. You might fight a war over land, gold, pepper or slaves, but not oil.

The career of electricity was more startling yet. Two centuries ago electricity played no role in the economy, and was used at most for arcane scientific experiments and cheap magic tricks. A series of inventions turned it into our universal genie in a lamp. We flick our fingers and it prints books and sews clothes, keeps our vegetables fresh and our ice cream frozen, cooks our dinners and executes our criminals, registers our thoughts and records our smiles, lights up our nights and entertains us with countless television shows. Few of us understand how electricity does all these things, but even fewer can imagine life without it.

另一個重要的發現是內燃機，僅僅一代人的時間就徹底改變了人類交通，並把石油變成液體政治力量。石油已經存在了數千年，用於防水屋頂和潤滑車軸。然而直到一個世紀前，沒有人認為它可以用於更多的用途。為了石油而流血的想法會顯得荒唐。你可能為了土地、金子、胡椒或奴隸而打仗，但不是為了石油。電力的發展更加驚人，兩個世紀前，電力在經濟中沒有任何作用，最多只用於奧秘科學實驗和便宜的魔術表演。一系列的發明把它變成了我們通用的燈中精靈。我們輕輕一點，它就能印書和縫製衣服，保持我們的蔬菜新鮮和冰淇淋冷凍，煮我們的晚餐和處決罪犯，記錄我們的想法和記錄我們的微笑，照亮我們的夜晚並以無數的電視節目娛樂我們。我們中很少有人理解電力如何實現所有這些事情，但很少有人能想象沒有電力的生活。

An Ocean of Energy

At heart, the Industrial Revolution has been a revolution in energy conversion. It has demonstrated again and again that there is no limit to the amount of energy at our disposal. Or, more precisely, that the only limit is set by our ignorance. Every few decades we discover a new energy source, so that the sum total of energy at our disposal just keeps growing.

Why are so many people afraid that we are running out of energy? Why do they warn of disaster if we exhaust all available fossil fuels? Clearly the world does not lack energy. All we lack is the knowledge necessary to harness and convert it to our needs. The amount of energy stored in all the fossil fuel on earth is negligible compared to the amount that the sun

dispenses every day, free of charge. Only a tiny proportion of the sun's energy reaches us, yet it amounts to 3,766,800 exajoules of energy each year (a joule is a unit of energy in the metric system, about the amount you expend to lift a small apple one yard straight up; an exajoule is a billion billion joules – that's a lot of apples). ²All the world's plants capture only about 3,000 of those solar exajoules through the process of photosynthesis. ³All human activities and industries put together consume about 500 exajoules annually, equivalent to the amount of energy earth receives from the sun in just ninety minutes. ⁴And that's only solar energy. In addition, we are surrounded by other enormous sources of energy, such as nuclear energy and gravitational energy, the latter most evident in the power of the ocean tides caused by the moon's pull on the earth.

工業革命其實是一場能源轉換的革命。它一再證明，我們可以掌握的能源沒有極限。或者更精確地說，唯一限制我們的是我們的無知。幾十年一次，我們就會發現一種新的能源來源，讓我們能夠不斷增加可利用的總能量。為什麼有這麼多人害怕我們會耗盡能源？為什麼他們警告說，如果我們用盡了所有可用的化石燃料，就會發生災難？顯然，這個世界不缺乏能源。我們缺乏的是利用和轉換能源所需的知識。地球上儲存的所有化石燃料所含的能量微不足道，與太陽每天免費提供的能量相比。太陽的能量只有極少數能夠到達我們，但每年仍然有3,766,800 exajoules的能量可供我們使用（焦耳是計量單位系統中的一個能量單位，大約是你用來將一個小蘋果垂直提起一碼的能量量；1 exajoule相當於十億億焦耳——這是一個非常大的數字）。²所有的植物只能通過光合作用捕獲其中的大約3,000個太陽系統Exajoules能量。³所有人類活動和工業每年消耗約500个Exajoules，相當於地球每90分钟從太陽吸收的能量量。⁴這還只是太陽能。此外，我們周圍還有其他巨大的能源，如核能和重力能，後者主要表現為海洋潮汐的力量，這是由於月球對地球的牽引所造成的。

Prior to the Industrial Revolution, the human energy market was almost completely dependent on plants. People lived alongside a green energy reservoir carrying 3,000 exajoules a year, and tried to pump as much of its energy as they could. Yet there was a clear limit to how much they could extract. During the Industrial Revolution, we came to realise that we are actually living alongside an enormous ocean of energy, one holding billions

upon billions of exajoules of potential power. All we need to do is invent better pumps.

*

Learning how to harness and convert energy effectively solved the other problem that slows economic growth – the scarcity of raw materials. As humans worked out how to harness large quantities of cheap energy, they could begin exploiting previously inaccessible deposits of raw materials (for example, mining iron in the Siberian wastelands), or transporting raw materials from ever more distant locations (for example, supplying a British textile mill with Australian wool). Simultaneously, scientific breakthroughs enabled humankind to invent completely new raw materials, such as plastic, and discover previously unknown natural materials, such as silicon and aluminium.

工業革命之前，人類的能源市場幾乎完全依賴於植物。人們生活在一個每年攜帶3,000 exajoules能量的綠色能源儲備旁，並努力抽取盡可能多的能量。然而，他們可以提取的能量有明顯的限制。在工業革命期間，我們意識到我們實際上是生活在一個巨大的能源海洋旁，這個海洋擁有數十億的exajoules潛力能量。我們所需要做的就是發明更好的泵。學習如何有效地利用和轉換能源解決了影響經濟增長的另一個問題-原材料的稀缺性。當人類想出如何利用大量廉價能源時，他們就可以開始開發以前無法到達的原材料儲量（例如，在西伯利亞荒野開採鐵礦），或從越來越遠的地方運輸原材料（例如，向英國紡織廠提供澳大利亞的羊毛）。同時，科學的突破使人類能夠發明全新的原材料，如塑料，並發現以前未知的天然材料，例如矽和鋁。

Chemists discovered aluminium only in the 1820s, but separating the metal from its ore was extremely difficult and costly. For decades, aluminium was much more expensive than gold. In the 1860s, Emperor Napoleon III of France commissioned aluminium cutlery to be laid out for his most distinguished guests. Less important visitors had to make do with the gold knives and forks. ⁵ But at the end of the nineteenth century chemists discovered a way to extract immense amounts of cheap aluminium, and current global production stands at 30 million tons per year. Napoleon III would be surprised to hear that his subjects' descendants use cheap

disposable aluminium foil to wrap their sandwiches and put away their leftovers.

Two thousand years ago, when people in the Mediterranean basin suffered from dry skin they smeared olive oil on their hands. Today, they open a tube of hand cream. Below is the list of ingredients of a simple modern hand cream that I bought at a local store:

化學家們在 1820 年代才發現了鋁，但從礦石中分離金屬非常困難且昂貴。幾十年來，鋁比黃金更貴。在 1860 年代，法國的拿破崙三世皇帝指示為他的賓客準備鋁刀叉。其他重要的訪客只能使用金色的刀叉。但在 19 世紀末，化學家發現了一種提取大量廉價鋁的方法，目前全球生產量為每年 3000 萬噸。拿破崙三世會驚訝地發現他的子民後代使用廉價的一次性鋁箔來包裹三明治並保存剩食。兩千年前，在地中海地區患有乾燥皮膚的人們，會在手上塗抹橄欖油。今天，他們會打開一管手霜。下面是我在當地商店購買的一種簡單現代手霜的成分列表：

deionised water, stearic acid, glycerin, caprylic/capric triglyceride, propylene glycol, isopropyl myristate, panax ginseng root extract, fragrance, cetyl alcohol, triethanolamine, dimeticone, arctostaphylos uva-ursi leaf extract, magnesium ascorbyl phosphate, imidazolidinyl urea, methyl paraben, camphor, propyl paraben, hydroxyisohexyl 3-cyclohexene carboxaldehyde, hydroxyl-citronellal, linalool, butylphenyl methylproplonal, citronellol, limonene, geraniol.

Almost all of these ingredients were invented or discovered in the last two centuries.

During World War One, Germany was placed under blockade and suffered severe shortages of raw materials, in particular saltpetre, an essential ingredient in gunpowder and other explosives. The most important saltpetre deposits were in Chile and India; there were none at all in Germany. True, saltpetre could be replaced by ammonia, but that was expensive to produce as well. Luckily for the Germans, one of their fellow citizens, a Jewish chemist named Fritz Haber, had discovered in 1908 a process for producing ammonia literally out of thin air. When war broke out, the Germans used Haber's discovery to commence industrial production of explosives using air

as a raw material. Some scholars believe that if it hadn't been for Haber's discovery, Germany would have been forced to surrender long before November 1918.⁶ The discovery won Haber (who during the war also pioneered the use of poison gas in battle) a Nobel Prize in 1918. In chemistry, not in peace.

去離子水、硬脂酸、甘油、辛酸/癸酸三酸甘油酯、丙二醇、肌醇棕櫚酸酯、人參根提取物、香水、鯨蠟醇、三乙醇胺、二甲基矽氧烷、歐洲山莓葉提取物、磷酸鎂抗壞血酸、咪唑尿素、對甲酸甲酯、樟腦、對羥基環己烯羧醛、氫氧基芳樟醇、芳樟醇、檸檬烯、齡香豆醛、香茅醇。這些成分幾乎都是在過去的兩個世紀中發明或發現的。第一次世界大戰期間，德國被封鎖，在原材料短缺方面遭受嚴重打擊，特別是硝酸鹽，這是火藥和其他爆炸物中必不可少的成分。最重要的硝酸鹽礦床在智利和印度，而德國根本沒有這些礦床。當然，硝酸鹽可以用氨來取代，但生產氨也很昂貴。幸運的是，德國的一位猶太化學家弗里茨·哈貝爾在1908年發現了一種從空氣中產生氨的方法。當戰爭爆發時，德國利用哈貝爾的發現開始使用空氣作為原材料進行工業化生產爆炸物。一些學者認為，如果沒有哈貝爾的發現，德國早在1918年11月就被迫投降了。哈貝爾的發現贏得了他1918年的諾貝爾化學獎（他在戰爭中還是毒氣在戰爭中的先驅），而不是和平獎。

Life on the Conveyor Belt

The Industrial Revolution yielded an unprecedented combination of cheap and abundant energy and cheap and abundant raw materials. The result was an explosion in human productivity. The explosion was felt first and foremost in agriculture. Usually, when we think of the Industrial Revolution, we think of an urban landscape of smoking chimneys, or the plight of exploited coal miners sweating in the bowels of the earth. Yet the Industrial Revolution was above all else the Second Agricultural Revolution.

During the last 200 years, industrial production methods became the mainstay of agriculture. Machines such as tractors began to undertake tasks that were previously performed by muscle power, or not performed at all. Fields and animals became vastly more productive thanks to artificial fertilisers, industrial insecticides and an entire arsenal of hormones and medications.

Refrigerators, ships and aeroplanes have made it possible to store produce for months, and transport it quickly and cheaply to the other side of the world. Europeans began to dine on fresh Argentinian beef and Japanese sushi.

工業革命從未有過的大量廉價能源和廉價原材料的結合，使人類生產力爆炸式增長。這種增長首先體現在農業上。通常當我們想到工業革命時，會想到冒著煙霧的城市景象，或是在地底下唯恐不安的受壓迫的煤礦工人。然而，工業革命最重要的是第二次農業革命。在過去200年的時間裡，工業生產方法成為農業的支柱。像拖拉機之類的機器開始承擔以前由肌肉動力執行的任務，或者根本就沒有執行。人工肥料、工業殺蟲劑和整整一套荷爾蒙和藥物使田地和動物的生產效率大幅提高。冰箱、船只和飛機使得儲存產品數月，並快速、便宜地運輸到世界的另一端成為可能。歐洲人開始享用新鮮的阿根廷牛肉和日本壽司。

Even plants and animals were mechanised. Around the time that *Homo sapiens* was elevated to divine status by humanist religions, farm animals stopped being viewed as living creatures that could feel pain and distress, and instead came to be treated as machines. Today these animals are often mass-produced in factory-like facilities, their bodies shaped in accordance with industrial needs. They pass their entire lives as cogs in a giant production line, and the length and quality of their existence is determined by the profits and losses of business corporations. Even when the industry takes care to keep them alive, reasonably healthy and well fed, it has no intrinsic interest in the animals' social and psychological needs (except when these have a direct impact on production).

連植物和動物都被機械化了。在*Homo sapiens*被人文主義宗教神化的時代，農場動物不再被視為能夠感受疼痛和痛苦的生物，而是被視為機器。如今，這些動物常常在工廠般的設施中大量生產，它們的身體按照工業需求塑造。它們的整個生命都像是生產線中的齒輪，其存在的長度和質量由商業公司的利潤和損失決定。即使在工業界試圖照顧它們的生命、健康和飲食，它們對動物的社交和心理需求沒有內在的興趣（除非這些需求對生產有直接影響）。

Egg-laying hens, for example, have a complex world of behavioural needs and drives. They feel strong urges to scout their environment, forage and peck around, determine social hierarchies, build nests and groom themselves. But the egg industry often locks the hens inside tiny coops, and it is not uncommon for it to squeeze four hens to a cage, each given a floor space of about twenty-five by twenty-two centimetres. The hens receive sufficient food, but they are unable to claim a territory, build a nest or engage in other natural activities. Indeed, the cage is so small that hens are often unable even to flap their wings or stand fully erect.

Pigs are among the most intelligent and inquisitive of mammals, second perhaps only to the great apes. Yet industrialised pig farms routinely confine nursing sows inside such small crates that they are literally unable to turn around (not to mention walk or forage). The sows are kept in these crates day and night for four weeks after giving birth. Their offspring are then taken away to be fattened up and the sows are impregnated with the next litter of piglets.

例如，下蛋母雞有一個複雜的行為需求和驅力的世界。它們有強烈的渴望去搜尋其環境，鑽探和啄食周圍的東西，確定社會等級，建立巢穴和打理自己。但蛋業通常將母雞鎖在小小的舍內，每個舍只有約二十五乘二十二厘米的空間，往往把四隻母雞擠在一個籠裡。這些母雞會得到足夠的食物，但它們無法宣示領地，建造巢穴或從事其他自然活動。實際上，籠子是如此狹小，以至於母雞通常甚至無法拍動翅膀或站直。豬是哺乳動物中最聰明和好奇的動物之一，僅次於大猩猩。然而，工業化的豬場經常把哺乳母豬關在如此小的籠子裡，以至於它們實際上無法轉身（更不用說行走或覓食）。母豬在分娩後的四周內始終待在籠子裡，晝夜不停。它們的後代然後被帶走養大，母豬又會再次懷孕生下下一窩豬仔。

Many dairy cows live almost all their allotted years inside a small enclosure; standing, sitting and sleeping in their own urine and excrement. They receive their measure of food, hormones and medications from one set of machines, and get milked every few hours by another set of machines. The cow in the middle is treated as little more than a mouth that takes in raw materials and an udder that produces a commodity. Treating living creatures possessing complex emotional worlds as if they were machines is likely to cause them

not only physical discomfort, but also much social stress and psychological frustration.⁷



40. Chicks on a conveyor belt in a commercial hatchery. Male chicks and imperfect female chicks are picked off the conveyor belt and are then asphyxiated in gas chambers, dropped into automatic shredders, or simply thrown into the rubbish, where they are crushed to death. Hundreds of millions of chicks die each year in such hatcheries .

許多乳牛在其生命中的大部分時間被關在小籠子裡，站立、坐著、睡覺，身處自己的尿液和排泄物中。牠們從一台機器中獲得食物、荷爾蒙和藥物，每隔幾個小時就被另一套機器擠奶。中間的牛只被當作吞嚥原料和產出商品的乳房，對待這些具有複雜情感世界的生物，彷彿牠們是機器，可能會造成牠們不僅是生理上的不適，還有許多社交壓力和心理挫折。商業孵化場上的小雞在輸送帶上運轉。雄性小雞和不完美的雌性小雞被挑出輸送帶，然後被關在氣體室裡窒息致死，被扔入自動碎紙機中，或者直接扔到垃圾堆裡，遭到粉碎死亡。每年有數以億計的小雞死在這樣的孵化場。

Just as the Atlantic slave trade did not stem from hatred towards Africans, so the modern animal industry is not motivated by animosity. Again, it is fuelled

by indifference. Most people who produce and consume eggs, milk and meat rarely stop to think about the fate of the chickens, cows or pigs whose flesh and emissions they are eating. Those who do think often argue that such animals are really little different from machines, devoid of sensations and emotions, incapable of suffering. Ironically, the same scientific disciplines which shape our milk machines and egg machines have lately demonstrated beyond reasonable doubt that mammals and birds have a complex sensory and emotional make-up. They not only feel physical pain, but can also suffer from emotional distress.

正如大西洋奴隸貿易不是由對非洲人的憎恨所引起的，現代的動物工業也並非出於敵意。相反，它是源於漠不關心。大多數生產和消費雞蛋、牛奶和肉類的人很少停下來思考他們正在食用的雞、牛或豬的命運。那些思考的人往往會辯稱這些動物和機器沒有什麼不同，缺乏感覺和情感，無法感受痛苦。具有諷刺意味的是，同樣的科學學科塑造了我們的乳牛機器和蛋機器，近來已經毫不含糊地證明哺乳動物和鳥類具有複雜的感覺和情感構造。它們不僅感受到身體的疼痛，還會受到情感困擾的折磨。

Evolutionary psychology maintains that the emotional and social needs of farm animals evolved in the wild, when they were essential for survival and reproduction. For example, a wild cow had to know how to form close relations with other cows and bulls, or else she could not survive and reproduce. In order to learn the necessary skills, evolution implanted in calves – as in the young of all other social mammals – a strong desire to play (playing is the mammalian way of learning social behaviour). And it implanted in them an even stronger desire to bond with their mothers, whose milk and care were essential for survival.

What happens if farmers now take a young calf, separate her from her mother, put her in a closed cage, give her food, water and inoculations against diseases, and then, when she is old enough, inseminate her with bull sperm? From an objective perspective, this calf no longer needs either maternal bonding or playmates in order to survive and reproduce. But from a subjective perspective, the calf still feels a very strong urge to bond with her mother and to play with other calves. If these urges are not fulfilled, the calf suffers greatly. This is the basic lesson of evolutionary psychology: a need

shaped in the wild continues to be felt subjectively even if it is no longer really necessary for survival and reproduction. The tragedy of industrial agriculture is that it takes great care of the objective needs of animals, while neglecting their subjective needs.

演化心理學認為，農場動物的情感和社交需求是在野外演化而來的，在那裡它們對生存和繁殖至關重要。例如，野生的母牛必須知道如何與其他母牛和公牛建立密切關係，否則她就無法生存和繁殖。為了學習必要的技能，進化將強烈的遊戲慾望（遊戲是哺乳動物學習社會行為的方式）和更強烈的與母親結合的慾望植入了小牛中，母乳和照顧對生存至關重要。如果農民現在取走一頭小牛，把它與母親分離，放進一個封閉的籠子裡，給予食物、水和接種疾病的預防針，然後等到它足夠大時用公牛的精液使其受孕，會發生什麼情況？客觀地說，這頭小牛再也不需要母親情感上的聯繫或玩伴來生存和繁殖。但主觀上，小牛仍然非常渴望與母親結合和與其他小牛玩耍。如果這些渴望得不到滿足，小牛會極度痛苦。這是演化心理學的基本教訓：在野外形成的需求即使在現實中已不再是生存和繁殖所必需，其主觀感受仍然存在。工業化農業的悲劇在於它關心動物的客觀需求，但忽視了動物的主觀需求。

The truth of this theory has been known at least since the 1950s, when the American psychologist Harry Harlow studied the development of monkeys. Harlow separated infant monkeys from their mothers several hours after birth. The monkeys were isolated inside cages, and then raised by dummy mothers. In each cage, Harlow placed two dummy mothers. One was made of metal wires, and was fitted with a milk bottle from which the infant monkey could suck. The other was made of wood covered with cloth, which made it resemble a real monkey mother, but it provided the infant monkey with no material sustenance whatsoever. It was assumed that the infants would cling to the nourishing metal mother rather than to the barren cloth one.

To Harlow's surprise, the infant monkeys showed a marked preference for the cloth mother, spending most of their time with her. When the two mothers were placed in close proximity, the infants held on to the cloth mother even while they reached over to suck milk from the metal mother. Harlow suspected that perhaps the infants did so because they were cold. So he fitted an electric bulb inside the wire mother, which now radiated heat. Most of the

monkeys, except for the very young ones, continued to prefer the cloth mother.

這個理論的真相自至少1950年代以來就已經被知曉，當時美國心理學家哈利·哈洛（Harry Harlow）研究了猴子的發展。哈洛在幼猴出生後幾個小時就將牠們與母親分開，並將牠們孤立在籠子裡，然後用仿製母親來養育。在每個籠子裡，哈洛放了兩個仿製母親。其中一個是由金屬線做成的，並裝有一個奶瓶，讓幼猴可以吸飲。另一個是由布覆蓋的木頭做成的，這使它看起來像真正的母猴，但它並沒有提供幼猴任何實質的養分。人們認為幼猴會依附於有營養的金屬母親，而不是貧瘠的布母親。但令哈洛驚訝的是，幼猴明顯偏愛那個布母親，並花了大部分的時間與她在一起。當這兩個母親放在靠近的地方時，即使幼猴跨越過去吸飲金屬母親的奶，它們仍緊緊抓住布母親。哈洛懷疑這可能是因為幼猴感到冷。因此，他在金屬母親內部裝了一個電燈泡，它現在散發熱量。除了最年幼的幼猴外，大多數猴子仍然更喜歡布母親。



41. One of Harlow's orphaned monkeys clings to the cloth mother even while sucking milk from the metal mother .

Follow-up research showed that Harlow's orphaned monkeys grew up to be emotionally disturbed even though they had received all the nourishment they required. They never fitted into monkey society, had difficulties communicating with other monkeys, and suffered from high levels of anxiety and aggression. The conclusion was inescapable: monkeys must have psychological needs and desires that go beyond their material requirements, and if these are not fulfilled, they will suffer greatly. Harlow's infant monkeys preferred to spend their time in the hands of the barren cloth mother because they were looking for an emotional bond and not only for milk. In the

following decades, numerous studies showed that this conclusion applies not only to monkeys, but to other mammals, as well as birds. At present, millions of farm animals are subjected to the same conditions as Harlow's monkeys, as farmers routinely separate calves, kids and other youngsters from their mothers, to be raised in isolation. [8](#)

41. 哈洛的一只孤儿猴子即使在从金属母猴吮乳时，也紧紧抱着布母猴。后续研究表明，尽管哈洛的孤儿猴子得到了所需的所有营养，他们成长为情感不稳定的猴子。他们从未适应猴子社会，难以与其他猴子沟通，并遭受高水平的焦虑和攻击性。结论是不可避免的：猴子必须有超越物质需求的心理需求和愿望，如果这些需求不能得到满足，他们将遭受巨大的痛苦。哈洛的幼猴更愿意呆在贫瘠的布母亲手中，因为他们寻找的是情感上的纽带，而不仅仅是牛奶。在接下来的几十年里，许多研究表明，这个结论不仅适用于猴子，也适用于其他哺乳动物以及鸟类。目前，数百万农场动物面临着与哈洛的猴子相同的条件，因为农民通常将小牛，小山羊和其他幼崽与他们的母亲分开，独立饲养。

Altogether, tens of billions of farm animals live today as part of a mechanised assembly line, and about 50 billion of them are slaughtered annually. These industrial livestock methods have led to a sharp increase in agricultural production and in human food reserves. Together with the mechanisation of plant cultivation, industrial animal husbandry is the basis for the entire modern socio-economic order. Before the industrialisation of agriculture, most of the food produced in fields and farms was 'wasted' feeding peasants and farmyard animals. Only a small percentage was available to feed artisans, teachers, priests and bureaucrats. Consequently, in almost all societies peasants comprised more than 90 per cent of the population. Following the industrialisation of agriculture, a shrinking number of farmers was enough to feed a growing number of clerks and factory hands. Today in the United States, only 2 per cent of the population makes a living from agriculture, yet this 2 per cent produces enough not only to feed the entire US population, but also to export surpluses to the rest of the world. [9](#) Without the industrialisation of agriculture the urban Industrial Revolution could never have taken place – there would not have been enough hands and brains to staff factories and offices.

現今全世界有數十億的農場動物被當作機器般的裝配線作業來維生，而每年約有500億隻農場動物被屠宰。這些工業化的畜牧業方法導致農業產量和人類食品儲備大幅提升。和工業化種植一起，工業化飼養動物是整個現代社會經濟體系的基礎。在農業工業化之前，大部分在田地和農場生產的食物都被浪費在餵養農民和農場動物上。只有少數百分比的食物能夠供應給工匠、教師、神職人員和政府官員。因此，在幾乎所有社會中，農民佔了人口的90%以上。隨著農業工業化的進行，越來越少的農民足以餵養越來越多的文員和工廠工人。今天在美國，只有2%的人口靠農業謀生，但這2%的人不僅生產足夠的農產品給全美國人民食用，還能夠將剩餘的農產品出口到世界其他國家。如果沒有農業工業化，城市工業革命就不可能發生-因為沒有足夠的人手和智慧來擔任工廠和辦公室的工作。

As those factories and offices absorbed the billions of hands and brains that were released from fieldwork, they began pouring out an unprecedented avalanche of products. Humans now produce far more steel, manufacture much more clothing, and build many more structures than ever before. In addition, they produce a mind-boggling array of previously unimaginable goods, such as light bulbs, mobile phones, cameras and dishwashers. For the first time in human history, supply began to outstrip demand. And an entirely new problem was born: who is going to buy all this stuff?

The Age of Shopping

The modern capitalist economy must constantly increase production if it is to survive, like a shark that must swim or suffocate. Yet it's not enough just to produce. Somebody must also buy the products, or industrialists and investors alike will go bust. To prevent this catastrophe and to make sure that people will always buy whatever new stuff industry produces, a new kind of ethic appeared: consumerism.

隨著那些工廠和辦公室吸收了數十億從田野勞作釋放出來的手和腦，它們開始傾瀉出前所未有的產品。人類現在生產的鋼材比以往更多，製造的衣服也更多，建造的結構也更多。此外，他們還生產了之前想都想不到的令人難以置信的產品，例如燈泡、手機、相機和洗碗機。在人類歷史上，供應開始超過需求。並產生了一個全新的問題：誰會

買這些東西呢？現代資本主義經濟如果要存活下去，必須不斷增加生產量，就像一條鯊魚必須游泳才能存活一樣。然而，僅僅生產是不夠的。必須有人買這些產品，否則工業家和投資者都會破產。為了防止這種災難，並確保人們總是會買工業生產的新產品，一種新的道德出現了：消費主義。

Most people throughout history lived under conditions of scarcity. Frugality was thus their watchword. The austere ethics of the Puritans and Spartans are but two famous examples. A good person avoided luxuries, never threw food away, and patched up torn trousers instead of buying a new pair. Only kings and nobles allowed themselves to renounce such values publicly and conspicuously flaunt their riches.

Consumerism sees the consumption of ever more products and services as a positive thing. It encourages people to treat themselves, spoil themselves, and even kill themselves slowly by overconsumption. Frugality is a disease to be cured. You don't have to look far to see the consumer ethic in action – just read the back of a cereal box. Here's a quote from a box of one of my favourite breakfast cereals, produced by an Israeli firm, Telma:

歷史上大多數人都生活在匱乏的條件下。因此節儉是他們的口號。清教徒和斯巴達人的嚴謹倫理是其中兩個著名的例子。一個好人不喜歡奢侈，從不浪費食物，而是縫補破爛的褲子而不是買一條新的。只有國王和貴族才能公然放棄這樣的價值觀並炫耀他們的財富。消費主義認為消費越來越多的產品和服務是一件好事。它鼓勵人們獎勵自己，縱容自己，甚至通過過度消費慢慢自殺。節儉是一種需要治愈的疾病。您不必走得太遠就可以看到消費倫理在行動-只需閱讀一個麥片餐盒的背面。以下是來自以色列公司Telma生產的我最喜愛的早餐穀類的盒子上的一句話：

Sometimes you need a treat. Sometimes you need a little extra energy. There are times to watch your weight and times when you've just got to have something ... right now! Telma offers a variety of tasty cereals just for you – treats without remorse.

The same package sports an ad for another brand of cereal called Health Treats:

Health Treats offers lots of grains, fruits and nuts for an experience that combines taste, pleasure and health. For an enjoyable treat in the middle of the day, suitable for a healthy lifestyle. *A real treat with the wonderful taste of more* [emphasis in the original].

Throughout most of history, people were likely to be have been repelled rather than attracted by such a text. They would have branded it as selfish, decadent and morally corrupt. Consumerism has worked very hard, with the help of popular psychology ('Just do it!') to convince people that indulgence is good for you, whereas frugality is self-oppression.

有時候你需要一些美食，有時候你需要更多能量。有時需要注意體重，有時候你就得立即得到你想要的！Telma為你提供各種美味的麥片——無悔的美食。同一個包裝上還有另一個品牌麥片的廣告，叫做Health Treats: Health Treats提供大量的穀物、水果和堅果，融合了口味、愉悅和健康感，讓你在一天的中途享受美食，適合健康的生活方式。帶著更美妙的口感，真正的美味。在大部分的歷史中，人們可能對此類文字感到反感，而不是吸引。他們會將其視為自私、墮落和道德上的腐敗。消費主義通過流行心理學的幫助（“Just do it! ”）非常努力地讓人們相信，沉迷於享樂對你有益，而節儉則是自我壓抑。

It has succeeded. We are all good consumers. We buy countless products that we don't really need, and that until yesterday we didn't know existed. Manufacturers deliberately design short-term goods and invent new and unnecessary models of perfectly satisfactory products that we must purchase in order to stay 'in'. Shopping has become a favourite pastime, and consumer goods have become essential mediators in relationships between family members, spouses and friends. Religious holidays such as Christmas have become shopping festivals. In the United States, even Memorial Day – originally a solemn day for remembering fallen soldiers – is now an occasion for special sales. Most people mark this day by going shopping, perhaps to prove that the defenders of freedom did not die in vain.

它成功了。我們都是好的消費者。我們購買了無數我們並不真正需要的產品，並且在昨天，我們並不知道這些產品的存在。製造商故意設計短期商品，發明全新的和不必要的產品型號，我們必須購買才能保持"時髦"。購物已成為一種喜愛的消遣，消費品已成為家庭成員、配

偶和朋友之間關係的必要媒介。像聖誕節這樣的宗教節日已成為購物節日。在美國，即使是原本是紀念陣亡士兵的慎重的紀念日——阵亡将士纪念日现在也成为特别销售的场合。大多数人通过购物来庆祝这一天，也许是为了证明捍卫自由的人并非白白牺牲。

The flowering of the consumerist ethic is manifested most clearly in the food market. Traditional agricultural societies lived in the awful shade of starvation. In the affluent world of today one of the leading health problems is obesity, which strikes the poor (who stuff themselves with hamburgers and pizzas) even more severely than the rich (who eat organic salads and fruit smoothies). Each year the US population spends more money on diets 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.

消費主義倫理的興起在食品市場最為明顯。傳統農業社會生活在飢餓的可怕陰影下。如今豐裕的世界中，肥胖症是領先的健康問題之一，貧窮者（他們狼吞虎嚥地吃漢堡和披薩）比富人（他們吃有機沙拉和水果冰沙）更加嚴重。美國人每年在節食方面花費的錢比用於餵飽其他所有國家的飢餓人口的金額還要多。肥胖症是消費主義的雙重勝利。人們不是吃少，而是吃太多，然後購買食品減肥產品 - 兩倍促進經濟增長。如何將商業人士的資本主義倫理道德與消費主義倫理道德相結合，根據其中賺取的利潤不應被浪費，而應該再投資生產呢？這很簡單。和以前一樣，精英和大眾之間存在分工。在中世紀的歐洲，貴族浪費錢財購買奢侈品，而農民節儉地生活，四處儲蓄。如今，桌

子已經翻轉。富人非常注意管理他們的資產和投資，而較不富裕的人則負債購買他們真正不需要的汽車和電視。

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.

資本主義和消費主義的倫理是同一個硬幣的兩面，是兩條命令的融合。富人的最高命令是“投資！”其餘人的最高命令是“購買！”資本主義-消費主義倫理在另一方面是革命性的。大多數先前的倫理體系向人們提供了非常嚴峻的要求。他們被承諾天堂，但前提是他們必須培養同情心和容忍力，克服渴望和憤怒，並抑制自私的利益。這對大多數人來說太難了。倫理的歷史是一個悲傷的故事，充滿了沒有人能夠實現的美好理想。大多數基督徒沒有效法基督，大多數佛教徒未能追隨佛陀，而大多數儒家會引起孔子的暴怒。相反，今天大多數人都成功地實現了資本主義-消費主義的理想。新倫理承諾在富人保持貪婪並花時間賺更多錢的條件下，民眾可以放任他們的渴望和激情-購買越來越多的東西，便可得到天堂。這是歷史上第一個讓其追隨者實際做到需求的宗教。然而，我們怎麼知道我們真的會得到天堂？我們在電視上看到過。

A Permanent Revolution

THE INDUSTRIAL REVOLUTION OPENED up new ways to convert energy and to produce goods, largely liberating humankind from its dependence on the surrounding ecosystem. Humans cut down forests, drained swamps, dammed rivers, flooded plains, laid down tens of thousands of kilometres of railroad tracks, and built skyscraping metropolises. As the world was moulded to fit the needs of *Homo sapiens*, habitats were destroyed and species went extinct. Our once green and blue planet is becoming a concrete and plastic shopping centre.

Today, the earths continents are home to almost 7 billion Sapiens. If you took all these people and put them on a large set of scales, their combined mass would be about 300 million tons. If you then took all our domesticated farmyard animals – cows, pigs, sheep and chickens – and placed them on an even larger set of scales, their mass would amount to about 700 million tons. In contrast, the combined mass of all surviving large wild animals – from porcupines and penguins to elephants and whales – is less than 100 million tons. Our children’s books, our iconography and our TV screens are still full of giraffes, wolves and chimpanzees, but the real world has very few of them left. There are about 80,000 giraffes in the world, compared to 1.5 billion cattle; only 200,000 wolves, compared to 400 million domesticated dogs; only 250,000 chimpanzees – in contrast to billions of humans. Humankind really has taken over the world.¹

工業革命開啟了新的能源轉換和生產商品的方式，大大解放了人類對周圍生態系的依賴。人類砍伐了森林、排干了沼澤、拦住了河流、淹沒了平原、鋪設了數萬公里的鐵路軌道和建造了高聳的大都市。當世界被塑造成適合智人需求的樣子，棲息地被毀壞，物種滅絕了。我們曾經綠油油、碧藍藍的星球正變成一個水泥和塑膠的購物中心。現今，地球上近70億智人居住。如果把所有的人放在一個大秤上衡

量，他們的總重量約為3億噸。如果把我們所有家畜——牛、豬、羊和雞——放在一個更大的秤上，他們的總重量將達到約7億噸。相比之下，所有存活的大型野生動物——從豪豬和企鵝到大象和鯨魚——的總重量不到1億噸。我們的兒童讀物、圖像符號和電視屏幕仍然充滿了長頸鹿、狼和黑猩猩，但現實世界中他們的數量非常有限。全世界大約有8萬頭長頸鹿，相比之下，有15億頭牛；僅有20萬頭狼，相比之下有4億只家犬；只有25萬隻黑猩猩——相比之下有數十億人類。人類真的接管了這個世界。

Ecological degradation is not the same as resource scarcity. As we saw in the previous chapter, the resources available to humankind are constantly increasing, and are likely to continue to do so. That's why doomsday prophesies of resource scarcity are probably misplaced. In contrast, the fear of ecological degradation is only too well founded. The future may see Sapiens gaining control of a cornucopia of new materials and energy sources, while simultaneously destroying what remains of the natural habitat and driving most other species to extinction.

In fact, ecological turmoil might endanger the survival of *Homo sapiens* itself. Global warming, rising oceans and widespread pollution could make the earth less hospitable to our kind, and the future might consequently see a spiralling race between human power and human-induced natural disasters. As humans use their power to counter the forces of nature and subjugate the ecosystem to their needs and whims, they might cause more and more unanticipated and dangerous side effects. These are likely to be controllable only by even more drastic manipulations of the ecosystem, which would result in even worse chaos.

生態惡化並非資源匱乏。正如我們在前一章中所看到的，人類可以利用的資源不斷增加，而且可能會繼續增加。因此，關於資源匱乏的末日預言可能是錯誤的。相反地，生態惡化的擔憂卻是實實在在的。未來可能會看到智人掌握豐盛新資源和能源來源，同時摧毀剩餘的自然棲息地，並把大多數其他物種推向滅絕。事實上，生態動蕩可能會危及智人自身的生存。全球變暖、海平面上升和廣泛污染可能會使地球對我們這樣的生物不再友好，未來可能因此看到人類能力與人為自然災害之間的競爭。當人類利用其力量來對抗自然力量並使生態系統受制於其需求和心血時，他們可能會引起越來越多未曾預料的危險副作用。

用。這些後果可能只能通過更加嚴重的生態系統操縱來控制，這將導致更加糟糕的混亂。

Many call this process ‘the destruction of nature’. But it’s not really destruction, it’s change. Nature cannot be destroyed. Sixty-five million years ago, an asteroid wiped out the dinosaurs, but in so doing opened the way forward for mammals. Today, humankind is driving many species into extinction and might even annihilate itself. But other organisms are doing quite well. Rats and cockroaches, for example, are in their heyday. These tenacious creatures would probably creep out from beneath the smoking rubble of a nuclear Armageddon, ready and able to spread their DNA. Perhaps 65 million years from now, intelligent rats will look back gratefully on the decimation wrought by humankind, just as we today can thank that dinosaur-busting asteroid.

Still, the rumours of our own extinction are premature. Since the Industrial Revolution, the world’s human population has burgeoned as never before. In 1700 the world was home to some 700 million humans. In 1800 there were 950 million of us. By 1900 we almost doubled our numbers to 1.6 billion. And by 2000 that quadrupled to 6 billion. Today there are just shy of 7 billion Sapiens.

許多人稱這個過程為「自然的毀滅」。但這實際上不是毀滅，而是改變。自然無法被摧毀。6500萬年前，一顆小行星摧毀了恐龍，但同時為哺乳動物開啟了前進的道路。如今，人類正在威脅許多物種的生存，甚至可能自我毀滅。但其他生物正在做得很好。例如老鼠和蟑螂正處在它們的巔峰期。這些頑強的生物可能會從核災中的煙燻碎片中爬出來，準備好散播它們的DNA。也許6500萬年後，聰明的老鼠會感激人類造成的破壞，就像我們今天能夠感謝那消滅恐龍的小行星一樣。然而，我們自己滅絕的傳聞尚為時尚早。自工業革命以來，世界人口前所未有地膨脹。1700年，世界上有大約7億人類。1800年，我們的人口增加到了9.5億。到1900年，我們的人口幾乎翻了一倍，達到了16億。到了2000年，這個數字增加了四倍，達到了60億。今天，全球有接近70億的智人。

Modern Time

While all these Sapiens have grown increasingly impervious to the whims of nature, they have become ever more subject to the dictates of modern industry and government. The Industrial Revolution opened the way to a long line of experiments in social engineering and an even longer series of unpremeditated changes in daily life and human mentality. One example among many is the replacement of the rhythms of traditional agriculture with the uniform and precise schedule of industry.

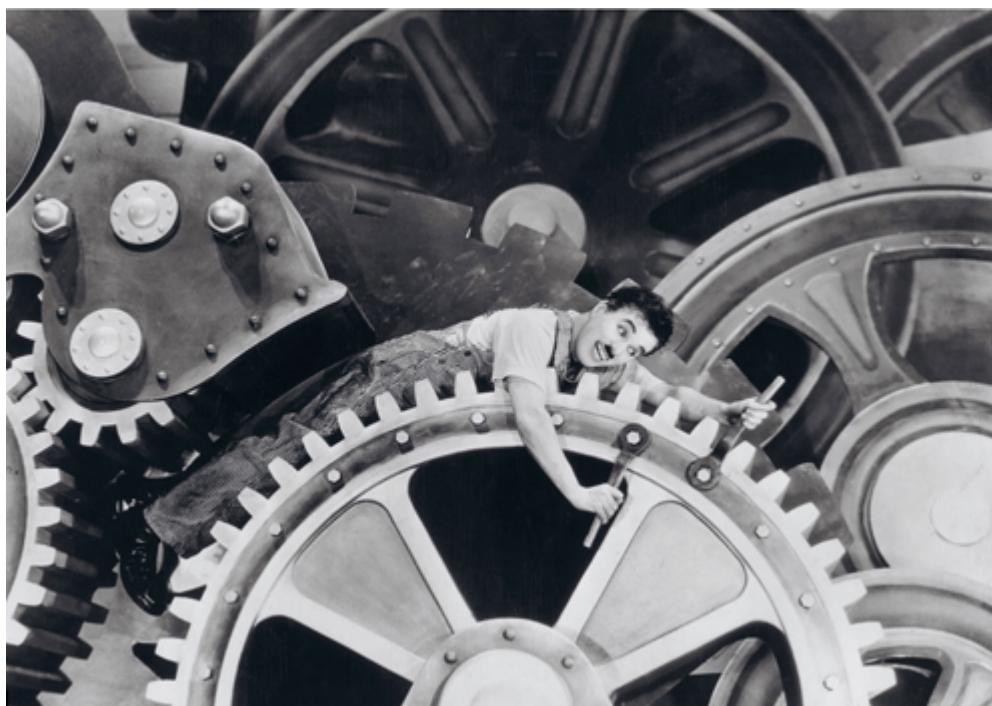
Traditional agriculture depended on cycles of natural time and organic growth. Most societies were unable to make precise time measurements, nor were they terribly interested in doing so. The world went about its business without clocks and timetables, subject only to the movements of the sun and the growth cycles of plants. There was no uniform working day, and all routines changed drastically from season to season. People knew where the sun was, and watched anxiously for portents of the rainy season and harvest time, but they did not know the hour and hardly cared about the year. If a lost time traveller popped up in a medieval village and asked a passerby, ‘What year is this?’ the villager would be as bewildered by the question as by the strangers ridiculous clothing.

所有的智人對自然的變幻變得越來越無感，卻變得更容易受現代工業和政府的支配。工業革命開啟了社會工程學和日常生活以及人類心態上的長期實驗。其中一個例子是，以傳統農業的循環節奏被工業的統一和精確時間表所取代。傳統的農業是依賴自然時間和有機生長的週期。大多數社會無法進行精確的時間測量，也不太關心這種測量。世界沒有時鐘和時刻表的競爭，僅僅受到太陽和植物的生長週期的影響。沒有統一的工作時間，所有的例行事項也因季節而急劇改變。人們知道太陽的位置，並焦急地觀察降雨季和收成季節的來臨，但他們不知道時間，也幾乎不關心年份。如果一個迷路的時間旅行者出現在中世紀的村莊並問一個路人，“現在是哪一年？”該村民會被這個問題同樣困惑，就像他被陌生人的怪裝束困惑一樣。

In contrast to medieval peasants and shoemakers, modern industry cares little about the sun or the season. It sanctifies precision and uniformity. For example, in a medieval workshop each shoemaker made an entire shoe, from sole to buckle. If one shoemaker was late for work, it did not stall the others. However, in a modern footwear-factory assembly line, every worker mans a

machine that produces just a small part of a shoe, which is then passed on to the next machine. If the worker who operates machine no. 5 has overslept, it stalls all the other machines. In order to prevent such calamities, everybody must adhere to a precise timetable. Each worker arrives at work at exactly the same time. Everybody takes their lunch break together, whether they are hungry or not. Everybody goes home when a whistle announces that the shift is over – not when they have finished their project.

與中世紀的農民和鞋匠相比，現代工業對陽光或季節的關注甚少，卻崇尚精確和一致。例如，在中世紀的工坊中，每個鞋匠都是從鞋底到扣子製作整只鞋子。如果一個鞋匠上班遲到了，那也不會拖延其他人。但是，在現代鞋業工廠的流水線上，每個工人操作的機器都只生產鞋子的一個小部分，然後交由下一個機器處理。如果操作第五台機器的工人睡過頭了，那麼所有機器都會停頓。為了防止這種災難，每個人都必須遵守精確的時間表。每個工人都在正確的時間到達工作崗位。無論是否餓了，每個人都一起休息。當口哨聲宣布班次結束時，每個人都下班，而不是等完成項目再離開。



42. Charlie Chaplin as a simple worker caught in the wheels of the industrial assembly line, from the film *Modern Times* (1936) .

The Industrial Revolution turned the timetable and the assembly line into a template for almost all human activities. Shortly after factories imposed their time frames on human behaviour, schools too adopted precise timetables, followed by hospitals, government offices and grocery stores. Even in places devoid of assembly lines and machines, the timetable became king. If the shift at the factory ends at 5 p.m., the local pub had better be open for business by 5:02.

A crucial link in the spreading timetable system was public transportation. If workers needed to start their shift by 08:00, the train or bus had to reach the factory gate by 07:55. A few minutes' delay would lower production and perhaps even lead to the lay-offs of the unfortunate latecomers. In 1784 a carriage service with a published schedule began operating in Britain. Its timetable specified only the hour of departure, not arrival. Back then, each British city and town had its own local time, which could differ from London time by up to half an hour. When it was 12:00 in London, it was perhaps 12:20 in Liverpool and 11:50 in Canterbury. Since there were no telephones, no radio or television, and no fast trains – who could know, and who cared?

[2](#)

查理·卓別林在電影《摩登時代》（1936年）中扮演一名被工業生產線困住的普通工人。工業革命將時間表和裝配線這兩個概念作為人類活動的範本。工廠先將他們的時間框架強加於人間行為，學校、醫院、政府辦公室和雜貨店也陸續採用精確的時間表。即便在沒有生產線和機器的地方，時間表也成了統治者。如果工廠的班次在下午五點結束，當地的酒吧最好在五點零二分開業。公共運輸是時間表系統的重要環節之一。如果工人需要在早上八點開始上班，那麼火車或公車必須在七點五十五分抵達工廠大門。幾分鐘的延誤可能會降低產量，甚至導致不幸的遲到者被解雇。1784年，英國開始運營一個有公告時間表的馬車服務。當時，每個英國城市和鎮都有自己的當地時間，與倫敦時間的差距最多可達半小時。當倫敦是中午12點時，利物浦可能是12點20分，坎特伯雷則是11點50分。當時還沒有電話、無線電或電視，也沒有快速列車，因此誰能知道，又有誰在意呢？

The first commercial train service began operating between Liverpool and Manchester in 1830. Ten years later, the first train timetable was issued. The trains were much faster than the old carriages, so the quirky differences in

local hours became a severe nuisance. In 1847, British train companies put their heads together and agreed that henceforth all train timetables would be calibrated to Greenwich Observatory time, rather than the local times of Liverpool, Manchester or Glasgow. More and more institutions followed the lead of the train companies. Finally, in 1880, the British government took the unprecedented step of legislating that all timetables in Britain must follow Greenwich. For the first time in history, a country adopted a national time and obliged its population to live according to an artificial clock rather than local ones or sunrise-to-sunset cycles.

1830年，第一班商業列車服務開始在利物浦和曼徹斯特之間運行。十年後，第一份火車時刻表得到發布。這些火車比舊馬車快得多，因此本地時間的稀奇古怪差異變得非常煩人。1847年，英國火車公司集合頭腦，一致同意從那時起所有火車時刻表將校準到格林威治天文台時間，而不是利物浦，曼徹斯特或格拉斯哥的當地時間。越來越多的機構效仿火車公司的做法。最後，在1880年，英國政府採取前所未有的措施，立法要求英國所有時刻表都必須遵循格林威治。歷史上，一個國家首次採用了國家時間，強制其人民按照人造時鐘而不是本地時鐘或日出至日落的週期生活。

This modest beginning spawned a global network of timetables, synchronised down to the tiniest fractions of a second. When the broadcast media – first radio, then television – made their debut, they entered a world of timetables and became its main enforcers and evangelists. Among the first things radio stations broadcast were time signals, beeps that enabled far-flung settlements and ships at sea to set their clocks. Later, radio stations adopted the custom of broadcasting the news every hour. Nowadays, the first item of every news broadcast – more important even than the outbreak of war – is the time. During World War Two, BBC News was broadcast to Nazi-occupied Europe. Each news programme opened with a live broadcast of Big Ben tolling the hour – the magical sound of freedom. Ingenious German physicists found a way to determine the weather conditions in London based on tiny differences in the tone of the broadcast ding-dongs. This information offered invaluable help to the Luftwaffe. When the British Secret Service discovered this, they replaced the live broadcast with a set recording of the famous clock.

這個謙虛的開始催生了一個全球網絡的時間表，其同步可以達到微小的秒數。當廣播媒體-首先是收音機，然後是電視-開始登場時，它們進入了一個時間表的世界，並成為其主要執行者和傳道者。無線電臺播出的第一件事就是時間信號，這些嘟嘟聲讓遠距離的定居地和在海上的船隻可以調整時鐘。後來，無線電臺採用了每小時播報新聞的習慣。現在，每個新聞廣播的第一條新聞-甚至比戰爭爆發更重要的是時間。在第二次世界大戰期間，BBC新聞向納粹占領的歐洲播出。每個新聞節目都以班加羅爵士鐘的現場廣播為開場-自由的神奇聲音。聰明的德國物理學家找到了一種根據廣播咚咚聲的微小差異來確定倫敦天氣狀況的方法。這些信息為空軍提供了寶貴的幫助。當英國秘密情報局發現這一點時，他們用著名時鐘的錄音取代了現場廣播。

In order to run the timetable network, cheap but precise portable clocks became ubiquitous. In Assyrian, Sassanid or Inca cities there might have been at most a few sundials. In European medieval cities there was usually a single clock – a giant machine mounted on top of a high tower in the town square. These tower clocks were notoriously inaccurate, but since there were no other clocks in town to contradict them, it hardly made any difference. Today, a single affluent family generally has more timepieces at home than an entire medieval country. You can tell the time by looking at your wristwatch, glancing at your Android, peering at the alarm clock by your bed, gazing at the clock on the kitchen wall, staring at the microwave, catching a glimpse of the TV or DVD, or taking in the taskbar on your computer out of the corner of your eye. You need to make a conscious effort *not* to know what time it is.

為了經營時刻表網路，廉價但精確的便攜式時鐘變得無處不在。在亞述、薩珊王朝或印加城市中，最多只有幾個日晷。在歐洲中世紀城市中，通常只有一個時鐘 - 一個巨大的機器安裝在市鎮廣場的高塔上。這些塔鐘以精確度不高而聞名，但由於城中沒有其他的時鐘來反駁它們，幾乎沒有任何影響。如今，一個有錢的家庭通常在家裡擁有比整個中世紀國家更多的時間計時器。你可以看一下手表就知道時間，看一下你的Android手機，瞄一眼你床邊的鬧鐘，凝視廚房牆上的時鐘，盯著微波爐，瞥一眼電視或DVD，或者從眼角瞥一眼計算機的任務欄。你需要有意識地不去知道現在是什麼時候。

The typical person consults these clocks several dozen times a day, because almost everything we do has to be done on time. An alarm clock wakes us up

at 7 a.m., we heat our frozen bagel for exactly fifty seconds in the microwave, brush our teeth for three minutes until the electric toothbrush beeps, catch the 07:40 train to work, run on the treadmill at the gym until the beeper announces that half an hour is over, sit down in front of the TV at 7 p.m. to watch our favourite show, get interrupted at preordained moments by commercials that cost \$1,000 per second, and eventually unload all our angst on a therapist who restricts our prattle to the now standard fifty-minute therapy hour.

The Industrial Revolution brought about dozens of major upheavals in human society. Adapting to industrial time is just one of them. Other notable examples include urbanisation, the disappearance of the peasantry, the rise of the industrial proletariat, the empowerment of the common person, democratisation, youth culture and the disintegration of patriarchy.

典型的人一天會使用這些鐘數十次，因為我們做的幾乎所有事情都必須按時完成。鬧鐘在早上7點喚醒我們，我們用微波爐將冰凍的百吉餅加熱50秒，刷牙三分鐘直到電動牙刷發出嘟聲，趕上上班的07:40火車，在健身房上跑步機一直到蜂鳴聲宣告半個小時已過，晚上7點坐在電視機前看我們最喜愛的節目，被每秒花費1,000美元的廣告打斷，最後向一位只限時50分鐘的治療師傾訴所有內心不安。工業革命帶來了人類社會的幾十次重大動盪，適應工業時間只是其中之一。其他值得注意的例子包括城市化、農民階層的消失、工業無產階級的崛起、普通人的授權、民主化、青年文化和家長權威的瓦解。

Yet all of these upheavals are dwarfed by the most momentous social revolution that ever befell humankind: the collapse of the family and the local community and their replacement by the state and the market. As best we can tell, from the earliest times, more than a million years ago, humans lived in small, intimate communities, most of whose members were kin. The Cognitive Revolution and the Agricultural Revolution did not change that. They glued together families and communities to create tribes, cities, kingdoms and empires, but families and communities remained the basic building blocks of all human societies. The Industrial Revolution, on the other hand, managed within little more than two centuries to break these building blocks into atoms. Most of the traditional functions of families and communities were handed over to states and markets.

然而，所有這些動盪都被人類至今最重大的社會革命所淹沒：家庭和地方社區的崩潰，以及被政府和市場所取代。據我們所知，從一百多萬年前的早期歷史開始，人類生活在小而親密的社區中，其中大多數成員都是親戚。認知革命和農業革命並沒有改變這一點。它們把家庭和社區粘在一起，創造了部落、城市、王國和帝國，但是家庭和社區仍然是所有人類社會的基本構成單位。另一方面，工業革命在短短兩個世紀內成功地把這些基本單位分解成原子。大多數傳統家庭和社區的功能被轉移給政府和市場。

The Collapse of the Family and the Community

Prior to the Industrial Revolution, the daily life of most humans ran its course within three ancient frames: the nuclear family, the extended family and the local intimate community. ^{*}Most people worked in the family business – the family farm or the family workshop, for example – or they worked in their neighbours' family businesses. The family was also the welfare system, the health system, the education system, the construction industry, the trade union, the pension fund, the insurance company, the radio, the television, the newspapers, the bank and even the police.

When a person fell sick, the family took care of her. When a person grew old, the family supported her, and her children were her pension fund. When a person died, the family took care of the orphans. If a person wanted to build a hut, the family lent a hand. If a person wanted to open a business, the family raised the necessary money. If a person wanted to marry, the family chose, or at least vetted, the prospective spouse. If conflict arose with a neighbour, the family muscled in. But if a person's illness was too grave for the family to manage, or a new business demanded too large an investment, or the neighbourhood quarrel escalated to the point of violence, the local community came to the rescue.

在工業革命之前，大多數人的日常生活都在三個古老的框架之內展開：核心家庭、擴展家庭和當地的友善社區。大多數人在家庭業務中工作，例如家庭農場或家庭車間，或者他們在鄰居的家庭企業中工作。家庭也是福利系統、健康系統、教育系統、建築行業、工會、退休金基金、保險公司、收音機、電視、報紙、銀行甚至是警察。當一

個人生病時，家庭照顧她。當一個人變老時，家庭支持她，她的孩子就是她的退休金基金。當一個人去世時，家庭照顧孤兒。如果一個人想蓋一個小屋，家庭會伸出援手。如果一個人想開一家企業，家庭會籌集必要的資金。如果一個人想結婚，家庭會選擇或至少審核未來的配偶。如果與鄰居發生衝突，家庭會干預。但是如果一個人的病情太嚴重，家庭無法應對，或者一個新的企業需要太大的投資，或者社區爭吵升級到暴力的地步，當地社區會出手相助。

The community offered help on the basis of local traditions and an economy of favours, which often differed greatly from the supply and demand laws of the free market. In an old-fashioned medieval community, when my neighbour was in need, I helped build his hut and guard his sheep, without expecting any payment in return. When I was in need, my neighbour returned the favour. At the same time, the local potentate might have drafted all of us villagers to construct his castle without paying us a penny. In exchange, we counted on him to defend us against brigands and barbarians. Village life involved many transactions but few payments. There were some markets, of course, but their roles were limited. You could buy rare spices, cloth and tools, and hire the services of lawyers and doctors. Yet less than 10 per cent of commonly used products and services were bought in the market. Most human needs were taken care of by the family and the community.

社區根據當地的傳統和基於恩惠的經濟來提供幫助，這通常與自由市場的供需法則大相徑庭。在一個老式的中世紀社區中，當我的鄰居需要幫助時，我會幫助他建造小屋並守護他的羊群，不期望任何回報。當我需要幫助時，我的鄰居會回報我這個恩惠。同時，地方上的有權人士可能徵召我們村民建造他的城堡，而不支付我們一分錢。作為交換，我們指望他保護我們免受強盜和野蠻人的侵害。村庄生活涉及了許多交易，但很少有支付。當然有一些市場，但它們的作用很有限。您可以購買稀有的香料、布料和工具，並聘請律師和醫生的服務。然而，常用產品和服務中不到10%是在市場上購買的。大多數人類需求都由家庭和社區照顧。

There were also kingdoms and empires that performed important tasks such as waging wars, building roads and constructing palaces. For these purposes kings raised taxes and occasionally enlisted soldiers and labourers. Yet, with few exceptions, they tended to stay out of the daily affairs of families and

communities. Even if they wanted to intervene, most kings could do so only with difficulty. Traditional agricultural economies had few surpluses with which to feed crowds of government officials, policemen, social workers, teachers and doctors. Consequently, most rulers did not develop mass welfare systems, health-care systems or educational systems. They left such matters in the hands of families and communities. Even on rare occasions when rulers tried to intervene more intensively in the daily lives of the peasantry (as happened, for example, in the Qin Empire in China), they did so by converting family heads and community elders into government agents.

有一些王國和帝國也扮演了重要的角色，例如發動戰爭、修建道路和建造宮殿。為此，國王們徵收稅款，偶爾還會招募士兵和勞工。不過，除了少數例外，他們都傾向於遠離家庭和社區的日常事務。即使他們想要干預，大多數國王也難以實現。傳統的農業經濟鮮有積存，用於餵養政府官員、警察、社工、教師和醫生的人力資源也極其有限。因此，大多數統治者沒有發展大規模的福利、醫療或教育體系。他們把這些問題留給了家庭和社區來處理。即使在稀有情況下，統治者試圖更加積極地干預農民的日常生活（例如中國秦朝時發生的情況），他們也是將家族長者和社區長老轉化為政府代理人。

Often enough, transportation and communication difficulties made it so difficult to intervene in the affairs of remote communities that many kingdoms preferred to cede even the most basic royal prerogatives – such as taxation and violence – to communities. The Ottoman Empire, for instance, allowed family vendettas to mete out justice, rather than supporting a large imperial police force. If my cousin killed somebody, the victim's brother might kill me in sanctioned revenge. The sultan in Istanbul or even the provincial pasha did not intervene in such clashes, as long as violence remained within acceptable limits.

In the Chinese Ming Empire (1368–1644), the population was organised into the *baojia* system. Ten families were grouped to form a *jia*, and ten *jia* constituted a *ba*. When a member of a *ba* committed a crime, other *ba* members could be punished for it, in particular the *ba* elders. Taxes too were levied on the *ba*, and it was the responsibility of the *ba* elders rather than of the state officials to assess the situation of each family and determine the amount of tax it should pay. From the empire's perspective, this system

had a huge advantage. Instead of maintaining thousands of revenue officials and tax collectors, who would have to monitor the earnings and expenses of every family, these tasks were left to the community elders. The elders knew how much each villager was worth and they could usually enforce tax payments without involving the imperial army.

交通和通訊困難常常使得介入偏遠社區的事務變得非常困難，以至於許多王國寧願放棄甚至是最基本的王權——如課稅和暴力——交由社區。例如，鄂圖曼帝國允許家族血仇來實行司法，而不是支持龐大的帝國警察部隊。如果我的表兄殺了某個人，那麼受害者的兄弟就可以合法報復殺我。伊斯坦布爾的蘇丹甚至是省長在這樣的衝突中都不會介入，只要暴力沒有超出可接受的限度。在中國明朝（1368-1644），人口組織成保甲制度。十戶人家被組成一家，十家為一保。當保的一個成員犯罪時，其他保成員可能會為此受到懲罰，尤其是保長。稅收也是從保中徵收，保長而非國家官員的責任是評估每個家庭的情況，決定其需要支付的稅款。對於帝國來說，這個制度有著巨大的優勢。而不是維護成千上萬的稅收官員和稅務徵收人員，他們必須監察每個家庭的收入和支出，這些任務留給了社區長者。長者知道每個村民的價值，他們通常可以在不涉及帝國軍隊的情況下強制徵稅。

Many kingdoms and empires were in truth little more than large protection rackets. The king was the *capo di tutti capi* who collected protection money, and in return made sure that neighbouring crime syndicates and local small fry did not harm those under his protection. He did little else.

Life in the bosom of family and community was far from ideal. Families and communities could oppress their members no less brutally than do modern states and markets, and their internal dynamics were often fraught with tension and violence – yet people had little choice. A person who lost her family and community around 1750 was as good as dead. She had no job, no education and no support in times of sickness and distress. Nobody would loan her money or defend her if she got into trouble. There were no policemen, no social workers and no compulsory education. In order to survive, such a person quickly had to find an alternative family or community. Boys and girls who ran away from home could expect, at best, to become servants in some new family. At worst, there was the army or the brothel.

許多王國和帝國實際上僅只是龐大的保護費組織，國王是領以徵收保護費的capo di tutti capi，作為回報，他確保鄰近的犯罪集團和當地的小魚小蝦不會傷害到受他保護的人們，除此之外，他幾乎無所作為。法律在家庭及社區的生活中遠非理想的存在，這些家庭和社區也會像現代的國家和市場一樣殘酷地壓迫著他們的成員，其內部動力常常具有緊張和暴力的傾向-但卻沒有其他選擇。在1750年左右，失去家庭和社區的一個人就像死了一樣，她沒有工作，沒有教育，也沒有在生病和困難時的支持。沒有人會借錢給她，如果她遇到麻煩，也沒有人會為她辯護。當時沒有警察，沒有社會工作者和強制教育。為了生存，這樣的人必須快速地找到另一個家庭或社區。從家中逃離的男孩和女孩最多期望成為新家庭的仆人，最壞的情況是進入軍隊或妓院。

All this changed dramatically over the last two centuries. The Industrial Revolution gave the market immense new powers, provided the state with new means of communication and transportation, and placed at the government's disposal an army of clerks, teachers, policemen and social workers. At first the market and the state discovered their path blocked by traditional families and communities who had little love for outside intervention. Parents and community elders were reluctant to let the younger generation be indoctrinated by nationalist education systems, conscripted into armies or turned into a rootless urban proletariat.

Over time, states and markets used their growing power to weaken the traditional bonds of family and community. The state sent its policemen to stop family vendettas and replace them with court decisions. The market sent its hawkers to wipe out longstanding local traditions and replace them with ever-changing commercial fashions. Yet this was not enough. In order really to break the power of family and community, they needed the help of a fifth column.

這一切在過去的兩個世紀發生了巨變。工業革命賦予市場巨大的新力量，為政府提供了新的通訊和運輸手段，為政府提供了一支文書、教師、警察和社工的軍隊。起初，市場和政府發現他們的道路被傳統家庭和社區所阻擋，這些家庭和社區對外部干預毫不熱衷。父母和社區長者不願讓年輕一代接受民族主義教育體系、被徵召入伍或成為流浪的城市無產階級。隨著時間的推移，國家和市場利用其日益增長的力量削弱了家庭和社區的傳統聯繫。政府派出警察阻止家庭血仇，以法

庭裁決取而代之。市場派出推銷員消滅長期的本地傳統，以不斷變化的商業時尚取而代之。但這還不夠。為真正打破家庭和社區的力量，他們需要第五列的幫助。

The state and the market approached people with an offer that could not be refused. ‘Become individuals,’ they said. ‘Marry whomever you desire, without asking permission from your parents. Take up whatever job suits you, even if community elders frown. Live wherever you wish, even if you cannot make it every week to the family dinner. You are no longer dependent on your family or your community. We, the state and the market, will take care of you instead. We will provide food, shelter, education, health, welfare and employment. We will provide pensions, insurance and protection.’

Romantic literature often presents the individual as somebody caught in a struggle against the state and the market. Nothing could be further from the truth. The state and the market are the mother and father of the individual, and the individual can survive only thanks to them. The market provides us with work, insurance and a pension. If we want to study a profession, the government’s schools are there to teach us. If we want to open a business, the bank loans us money. If we want to build a house, a construction company builds it and the bank gives us a mortgage, in some cases subsidised or insured by the state. If violence flares up, the police protect us. If we are sick for a few days, our health insurance takes care of us. If we are debilitated for months, social security steps in. If we need around-the-clock assistance, we can go to the market and hire a nurse – usually some stranger from the other side of the world who takes care of us with the kind of devotion that we no longer expect from our own children. If we have the means, we can spend our golden years at a senior citizens’ home. The tax authorities treat us as individuals, and do not expect us to pay the neighbours’ taxes. The courts, too, see us as individuals, and never punish us for the crimes of our cousins.

國家和市場向人們提出了一個無法拒絕的提議。「成為個人，」他們說。「無需徵求父母的許可婚姻所愛的人。無論社區長者是否反對，擔任任何適合你的工作。居住在你想要的任何地方，即使你每週都無法參加家庭晚宴。你不再依賴你的家庭或社區。我們，國家和市場，將代替你照顧你。我們將提供食物、住所、教育、健康、福利和就業。我們會提供退休金、保險和保護。」浪漫文學經常描述個人和國

家和市場之間的鬥爭。事實上，這說法相去甚遠。國家和市場是個人的父母親，個人只能靠他們才能生存。市場為我們提供工作、保險和退休金。如果我們想學習一個職業，政府的學校可以教我們。如果我們想開創一個企業，銀行會貸款給我們。如果我們想建造一棟房子，建築公司建造它，銀行提供抵押貸款，在某些情況下由政府提供補貼或保險。如果暴力爆發，警察會保護我們。如果我們生病幾天，我們的健康保險會照顧我們。如果我們長期殘疾，社會保障會介入。如果我們需要全天候的幫助，我們可以去市場雇用一名護士，通常是來自世界另一端的陌生人，以我們的孩子不再期望的奉獻精神照顧我們。如果我們有能力，我們可以在老年人住所度過晚年。稅務機關把我們視為個人，不期望我們支付鄰居的稅款。法院也視我們為個人，從不因我們的表兄弟犯罪而懲罰我們。

Not only adult men, but also women and children, are recognised as individuals. Throughout most of history, women were often seen as the property of family or community. Modern states, on the other hand, see women as individuals, enjoying economic and legal rights independently of their family and community. They may hold their own bank accounts, decide whom to marry, and even choose to divorce or live on their own.

But the liberation of the individual comes at a cost. Many of us now bewail the loss of strong families and communities and feel alienated and threatened by the power the impersonal state and market wield over our lives. States and markets composed of alienated individuals can intervene in the lives of their members much more easily than states and markets composed of strong families and communities. When neighbours in a high-rise apartment building cannot even agree on how much to pay their janitor, how can we expect them to resist the state?

不僅限於成年男性，女性和兒童也被視為獨立的個體。在大部分的歷史中，女性通常被視為家庭或社區的財產。而現代的國家則將女性視為個體，享有獨立於家庭和社區的經濟和法律權利。她們可以擁有自己的銀行帳戶，決定要與誰結婚，甚至選擇離婚或獨自居住。但是，個體的解放是有代價的。現在，許多人痛惜強大的家庭和社區的流失，並對無情的國家和市場在我們生活中所擁有的權力感到疏離和威脅。由疏離的個體組成的國家和市場比由強有力的家庭和社區組成的

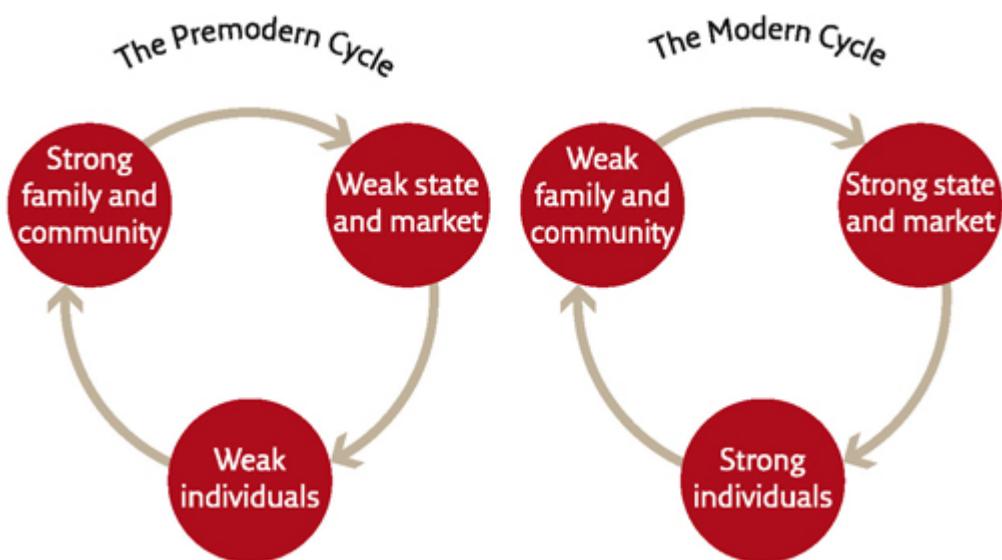
更容易干涉他們成員的生活。當高層公寓內的鄰居甚至無法就支付清潔工的費用達成共識時，我們如何期望他們抵制國家呢？

The deal between states, markets and individuals is an uneasy one. The state and the market disagree about their mutual rights and obligations, and individuals complain that both demand too much and provide too little. In many cases individuals are exploited by markets, and states employ their armies, police forces and bureaucracies to persecute individuals instead of defending them. Yet it is amazing that this deal works at all – however imperfectly. For it breaches countless generations of human social arrangements. Millions of years of evolution have designed us to live and think as community members. Within a mere two centuries we have become alienated individuals. Nothing testifies better to the awesome power of culture.

The nuclear family did not disappear completely from the modern landscape. When states and markets took from the family most of its economic and political roles, they left it some important emotional functions. The modern family is still supposed to provide for intimate needs, which state and market are (so far) incapable of providing. Yet even here the family is subject to increasing interventions. The market shapes to an ever-greater degree the way people conduct their romantic and sexual lives. Whereas traditionally the family was the main matchmaker, today it's the market that tailors our romantic and sexual preferences, and then lends a hand in providing for them – for a fat fee. Previously bride and groom met in the family living room, and money passed from the hands of one father to another. Today courting is done at bars and cafés, and money passes from the hands of lovers to waitresses. Even more money is transferred to the bank accounts of fashion designers, gym managers, dieticians, cosmeticians and plastic surgeons, who help us arrive at the café looking as similar as possible to the markets ideal of beauty.

國家，市場和個人之間的交易是一個不穩定的交易。國家和市場對於彼此的權利和義務有分歧，個人抱怨兩者都要求太多，而且提供太少。在許多情況下，個人受市場剝削，國家利用他們的軍隊，警察力量和官僚機構來迫害個人，而不是為他們辯護。然而，令人驚訝的是，這項交易完美地運作 - 雖然不完美。因為它違反了無數世代的人

類社會安排。數百萬年的進化使我們設計成社區成員的生活和思考。在短短的兩個世紀內，我們已經成為疏離的個體。沒有什麼比文化的驚人力量更能證明這一點。核心家庭並沒有完全從現代風景中消失。當國家和市場從家庭中取走大部分經濟和政治角色時，他們將一些重要的情感功能留給了它。現代家庭仍然被認為提供親密需要，國家和市場（到目前為止）無法提供。然而，即使在這裡，家庭也面臨日益增加的干預。市場越來越多地塑造人們的浪漫和性生活方式。婚姻媒介以前是家庭主要的媒人，今天市場定制我們的浪漫和性偏好，然後幫助我們提供它們 - 要付出高昂的費用。以前新郎和新娘在家庭客廳相遇，錢從一個父親的手中傳到另一個父親的手中。今天，約會在酒吧和咖啡館進行，錢從情侶的手中傳遞給女服務員。更多的錢轉移到時尚設計師，健身房經理，營養師，化妝師和整形外科醫生的銀行帳戶中，他們幫助我們看起來與市場理想的美麗相似。



Family and community vs. state and market

The state, too, keeps a sharper eye on family relations, especially between parents and children. Parents are obliged to send their children to be educated by the state. Parents who are especially abusive or violent with their children may be restrained by the state. If need be, the state may even imprison the parents or transfer their children to foster families. Until not long ago, the suggestion that the state ought to prevent parents from beating or humiliating their children would have been rejected out of hand as ludicrous and unworkable. In most societies parental authority was sacred. Respect of

and obedience to one's parents were among the most hallowed values, and parents could do almost anything they wanted, including killing newborn babies, selling children into slavery and marrying off daughters to men more than twice their age. Today, parental authority is in full retreat. Youngsters are increasingly excused from obeying their elders, whereas parents are blamed for anything that goes wrong in the life of their child. Mum and Dad are about as likely to get off in the Freudian courtroom as were defendants in a Stalinist show trial.

家庭和社群 vs. 國家和市場 國家也會更加關注家庭關係，尤其是父母和子女之間的關係。父母有義務讓他們的子女接受國家的教育。對於那些對子女特別虐待或暴力的父母，國家有權加以制止。如有需要，國家甚至可以拘留父母或將他們的孩子轉交領養家庭。直到不久以前，建議國家應該防止父母施暴、侮辱孩子的想法會被認為是荒謬和不可行的。在大多數社會中，父母的權威是神聖的。尊重和服從父母是最令人尊敬的價值之一，父母幾乎可以做任何事情，包括殺死新生嬰兒、賣孩子為奴隸和讓女兒嫁給年齡超過兩倍的男人。如今，父母的權威正全面退縮。年輕人越來越有理由不服從長輩，而父母則對孩子生活中出現的任何問題承擔責任。爸爸媽媽在弗洛伊德式的法庭上幾乎和斯大林式的示範審判中的被告一樣難以逃脫責罰。

Imagined Communities

Like the nuclear family, the community could not completely disappear from our world without any emotional replacement. Markets and states today provide most of the material needs once provided by communities, but they must also supply tribal bonds.

Markets and states do so by fostering 'imagined communities' that contain millions of strangers, and which are tailored to national and commercial needs. An imagined community is a community of people who don't really know each other, but imagine that they do. Such communities are not a novel invention. Kingdoms, empires and churches functioned for millennia as imagined communities. In ancient China, tens of millions of people saw themselves as members of a single family, with the emperor as its father. In the Middle Ages, millions of devout Muslims imagined that they were all

brothers and sisters in the great community of Islam. Yet throughout history, such imagined communities played second fiddle to intimate communities of several dozen people who knew each other well. The intimate communities fulfilled the emotional needs of their members and were essential for everyone's survival and welfare. In the last two centuries, the intimate communities have withered, leaving imagined communities to fill in the emotional vacuum.

就像核心家庭一样，社區若失去了任何情感替代方案將無法完全消失在我們的世界中。如今，市場和國家提供了以往由社區提供的大部分物質需求，但它們也必須提供部落情誼。通過培育符合國家和商業需求的“虛構社區”，市場和國家會做到這一點。虛構社區是一個由不真正互相認識但想像彼此相識的人組成的社區。這樣的社區並不是新的發明。王國、帝國和教會作為虛構社區已有幾千年的歷史。在古代中國，數千萬人視自己為一個家族的成員，以皇帝為父。在中世紀，數百萬虔誠的穆斯林想像他們都是伊斯蘭大社區中的兄弟姐妹。然而，在整個歷史上，這樣的虛構社區不如幾十個互相認識的人之間的親密社區重要。親密社區滿足了成員的情感需求，對每個人的生存和福祉都至關重要。在過去的兩個世紀中，親密社區已經枯萎，使虛構社區填補了情感真空。

The two most important examples for the rise of such imagined communities are the nation and the consumer tribe. The nation is the imagined community of the state. The consumer tribe is the imagined community of the market. Both are *imagined* communities because it is impossible for all customers in a market or for all members of a nation really to know one another the way villagers knew one another in the past. No German can intimately know the other 80 million members of the German nation, or the other 500 million customers inhabiting the European Common Market (which evolved first into the European Community and finally became the European Union).

Consumerism and nationalism work extra hours to make us imagine that millions of strangers belong to the same community as ourselves, that we all have a common past, common interests and a common future. This isn't a lie. It's imagination. Like money, limited liability companies and human rights, nations and consumer tribes are inter-subjective realities. They exist only in our collective imagination, yet their power is immense. As long as millions

of Germans believe in the existence of a German nation, get excited at the sight of German national symbols, retell German national myths, and are willing to sacrifice money, time and limbs for the German nation, Germany will remain one of the strongest powers in the world.

崛起這種虛構社群的最重要的例子是國家和消費者部落。國家是國家的虛構社群。消費者部落是市場的虛構社群。它們都是虛構社群，因為在市場上的所有客戶或在國家的所有成員都不可能真正地彼此認識，就像過去的村民那樣相識。沒有德國人可以熟悉地認識其他8000萬德國國民，或在歐洲共同市場中居住的其他5億客戶（它先演變為歐洲共同市場，最終成為歐洲聯盟）。消費主義和民族主義加班加點地工作，讓我們想像數百萬陌生人屬於與我們相同的社群，我們所有人都有共同的過去，共同的利益和共同的未來。這不是謊言，而是想像。像金錢，有限責任公司和人權一樣，國家和消費者部落是相互主觀的現實。它們只存在於我們的集體想像中，但它們的力量是巨大的。只要數百萬德國人相信德國國家的存在，當看到德國國家的象徵時感到興奮，重新講述德國國家的神話，並且願意為德國國家犧牲金錢，時間和肢體時，德國將仍然是世界上最強大的力量之一。

The nation does its best to hide its imagined character. Most nations argue that they are a natural and eternal entity, created in some primordial epoch by mixing the soil of the motherland with the blood of the people. Yet such claims are usually exaggerated. Nations existed in the distant past, but their importance was much smaller than today because the importance of the state was much smaller. A resident of medieval Nuremberg might have felt some loyalty towards the German nation, but she felt far more loyalty towards her family and local community, which took care of most of her needs. Moreover, whatever importance ancient nations may have had, few of them survived. Most existing nations evolved only after the Industrial Revolution.

The Middle East provides ample examples. The Syrian, Lebanese, Jordanian and Iraqi nations are the product of haphazard borders drawn in the sand by French and British diplomats who ignored local history, geography and economy. These diplomats determined in 1918 that the people of Kurdistan, Baghdad and Basra would henceforth be 'Iraqis'. It was primarily the French who decided who would be Syrian and who Lebanese. Saddam Hussein and Hafez el-Asad tried their best to promote and reinforce their Anglo-French-

manufactured national consciousnesses, but their bombastic speeches about the allegedly eternal Iraqi and Syrian nations had a hollow ring.

國家盡力隱藏其虛構性格。大多數國家主張它們是自然且永恆的實體，由母國的土壤與人民的血液在某個原始時期混合而成。然而，這樣的主張通常是誇張的。國家在遙遠的過去存在過，但它們的重要性遠不如今天，因為國家的重要性要小得多。中世紀的紐倫堡居民可能對德國國家有一些忠誠，但她對家庭和當地社區的忠誠更加強烈，這些地方照顧了她的大部分需求。此外，無論古代國家有多重要，很少有國家存活下來。大多數現有的國家都是在工業革命之後演化出來的。中東提供了充足的的例子。敘利亞、黎巴嫩、約旦和伊拉克國家是由法國和英國外交官在沙漠中任意劃定的邊界而產生的，並忽略了當地的歷史、地理和經濟。這些外交官於1918年決定庫爾德、巴格達和巴士拉的人民從此成為“伊拉克人”，而由法國人決定誰是敘利亞人，誰是黎巴嫩人。薩達姆·侯賽因和哈菲茲·阿薩德試圖盡力推廣和加強他們的英法製造的國家意識，但他們關於所謂永恆的伊拉克和敘利亞國家的誇大言辭卻是空洞的。

It goes without saying that nations cannot be created from thin air. Those who worked hard to construct Iraq or Syria made use of real historical, geographical and cultural raw materials – some of which are centuries and millennia old. Saddam Hussein co-opted the heritage of the Abbasid caliphate and the Babylonian Empire, even calling one of his crack armoured units the Hammurabi Division. Yet that does not turn the Iraqi nation into an ancient entity. If I bake a cake from flour, oil and sugar, all of which have been sitting in my pantry for the past two months, it does not mean that the cake itself is two months old.

In recent decades, national communities have been increasingly eclipsed by tribes of customers who do not know one another intimately but share the same consumption habits and interests, and therefore feel part of the same consumer tribe – and define themselves as such. This sounds very strange, but we are surrounded by examples. Madonna fans, for example, constitute a consumer tribe. They define themselves largely by shopping. They buy Madonna concert tickets, CDs, posters, shirts and ring tones, and thereby define who they are. Manchester United fans, vegetarians and environmentalists are other examples. They, too, are defined above all by

what they consume. It is the keystone of their identity. A German vegetarian might well prefer to marry a French vegetarian than a German carnivore.

民族不可能从空中创建，这是毋庸置疑的。那些努力建设伊拉克或叙利亚的人利用了真实的历史、地理和文化原材料，其中一些可以追溯到几个世纪甚至几千年前。萨达姆·侯赛因利用了阿巴思王朝和巴比伦帝国的遗产，甚至将他的一支重装甲部队命名为哈姆拉比师。然而，这并不意味着伊拉克国家是一个古老的实力。就好比我用放在食品储藏室里两个月的面粉、油和糖烤了一个蛋糕，这并不意味着这个蛋糕本身就有两个月的历史。近几十年来，民族社群逐渐被消费者部落所取代。这些消费者们并不互相了解，但他们享有相同的消费习惯和兴趣，并因此认为自己是同一个消费者部落的一员——并将自己定义为这个部落的一员。这听起来很奇怪，但我们身边的例子很多。例如，麦当娜的粉丝构成了一个消费者部落。他们的身份主要是由购物定义的。他们购买麦当娜的演唱会门票、CD、海报、衬衫和铃声，从而定义自己的身份。曼联球迷、素食主义者和环保主义者也是其他的例子。他们也主要通过消费来定义自己的身份。德国素食主义者可能更愿意嫁给一个法国素食主义者而不是一个德国食肉动物。

Perpetuum Mobile

The revolutions of the last two centuries have been so swift and radical that they have changed the most fundamental characteristic of the social order. Traditionally, the social order was hard and rigid. ‘Order’ implied stability and continuity. Swift social revolutions were exceptional, and most social transformations resulted from the accumulation of numerous small steps. Humans tended to assume that the social structure was inflexible and eternal. Families and communities might struggle to change their place within the order, but the idea that you could change the fundamental structure of the order was alien. People tended to reconcile themselves to the status quo, declaring that ‘this is how it always was, and this is how it always will be’.

Over the last two centuries, the pace of change became so quick that the social order acquired a dynamic and malleable nature. It now exists in a state of permanent flux. When we speak of modern revolutions we tend to think of 1789 (the French Revolution), 1848 (the liberal revolutions) or 1917 (the

Russian Revolution). But the fact is that, these days, every year is revolutionary. Today, even a thirty-year-old can honestly tell disbelieving teenagers, ‘When I was young, the world was completely different.’ The Internet, for example, came into wide usage only in the early 1990s, hardly twenty years ago. Today we cannot imagine the world without it.

過去兩個世紀的革命是如此迅速和激進，以致於改變了社會秩序中最基本的特徵。傳統上，社會秩序是堅實而僵硬的。“秩序”暗示穩定性和連續性。快速的社會革命是例外，大多數社會轉型是由許多小步驟積累而成的。人們往往認為社會結構是不可撼動的和永恆的。家庭和社區可能會努力改變它們在秩序中的地位，但思考改變秩序的基本結構是陌生的。人們傾向於自我安慰現狀，聲明“這就是一直以來的狀況，也永遠如此”。在過去的兩個世紀中，變化的速度變得如此之快，以至於社會秩序獲得了動態和可塑的性質。現在，它存在於一個不斷變化的狀態中。當我們談到現代革命時，我們往往想到1789年（法國大革命），1848年（自由主義革命）或1917年（俄羅斯革命）。但事實是，現在每年都是革命性的。例如，今天甚至連30歲的人都可以坦率地告訴不信的少年：“當我年輕時，世界已經完全不同了。”例如，互聯網僅於20年前的90年代初期開始廣泛使用。今天，我們無法想象沒有它的世界。

Hence any attempt to define the characteristics of modern society is akin to defining the colour of a chameleon. The only characteristic of which we can be certain is the incessant change. People have become used to this, and most of us think about the social order as something flexible, which we can engineer and improve at will. The main promise of premodern rulers was to safeguard the traditional order or even to go back to some lost golden age. In the last two centuries, the currency of politics is that it promises to destroy the old world and build a better one in its place. Not even the most conservative of political parties vows merely to keep things as they are. Everybody promises social reform, educational reform, economic reform—and they often fulfil those promises.

現代社會特性的任何定義都類似於定義變色龍的顏色。我們唯一可以確定的特徵就是不斷變化。人們已經習慣了這一點，大多數人認為社會秩序是一種靈活的東西，我們可以自行設計和改進。傳統統治者的主要承諾是保護傳統秩序，甚至回到某個失落的黃金時代。在過去的

兩個世紀中，政治的貨幣是承諾摧毀舊世界，在其位置上建立一個更好的新世界。即使是最保守的政黨也不僅僅是保持現狀的承諾。每個人都承諾社會改革、教育改革、經濟改革-而他們通常會履行那些承諾。

Just as geologists expect that tectonic movements will result in earthquakes and volcanic eruptions, so might we expect that drastic social movements will result in bloody outbursts of violence. The political history of the nineteenth and twentieth centuries is often told as a series of deadly wars, holocausts and revolutions. Like a child in new boots leaping from puddle to puddle, this view sees history as leapfrogging from one bloodbath to the next, from World War One to World War Two to the Cold War, from the Armenian genocide to the Jewish genocide to the Rwandan genocide, from Robespierre to Lenin to Hitler.

There is truth here, but this all too familiar list of calamities is somewhat misleading. We focus too much on the puddles and forget about the dry land separating them. The late modern era has seen unprecedented levels not only of violence and horror, but also of peace and tranquillity. Charles Dickens wrote of the French Revolution that ‘It was the best of times, it was the worst of times.’ This may be true not only of the French Revolution, but of the entire era it heralded.

就像地質學家預測地殼運動會導致地震和火山爆發一樣，我們也可以預期激烈的社會運動會導致血腥的暴力爆發。十九和二十世紀的政治歷史經常以致命的戰爭、大屠殺和革命的一系列事件講述。就像一個穿著新靴子的孩子從一個水坑跳到另一個水坑，這種觀點認為歷史是從一個血腥事件跳到下一個血腥事件，從一戰到二戰再到冷戰，從亞美尼亞種族滅絕到猶太人種族滅絕再到盧旺達種族滅絕，從羅伯斯庇爾到列寧再到希特勒。這種觀點有一定道理，但這個過於熟悉的災難清單有點誤導人。我們太過關注水坑，卻忘記它們之間的乾地。近代以來，不僅是暴力和恐怖達到了前所未有的程度，和平和寧靜也達到了前所未有的程度。查爾斯·狄更斯在《雙城記》中寫道：“這是最好的時代，也是最壞的時代。”這不僅適用於法國大革命，也適用於整個時代。

It is especially true of the seven decades that have elapsed since the end of World War Two. During this period humankind has for the first time faced the possibility of complete self-annihilation and has experienced a fair number of actual wars and genocides. Yet these decades were also the most peaceful era in human history – and by a wide margin. This is surprising because these very same decades experienced more economic, social and political change than any previous era. The tectonic plates of history are moving at a frantic pace, but the volcanoes are mostly silent. The new elastic order seems to be able to contain and even initiate radical structural changes without collapsing into violent conflict.³

Peace in Our Time

Most people don't appreciate just how peaceful an era we live in. None of us was alive a thousand years ago, so we easily forget how much more violent the world used to be. And as wars become more rare they attract more attention. Many more people think about the wars raging today in Afghanistan and Iraq than about the peace in which most Brazilians and Indians live.

自二次大戰結束以來的七十年來特別成立。在這段期間，人類第一次面臨徹底自我毀滅的可能性，經歷了相當多的實際戰爭和種族滅絕。然而，這些十年也是人類歷史上最和平的時代，而且差距非常大。這很令人驚訝，因為這些十年經歷了比任何以前的時代更多的經濟、社會和政治變革。歷史板塊正在瘋狂地移動，但火山大多是靜默的。新的彈性秩序似乎能夠容納甚至啟動激進的結構性變革，而不會崩潰成暴力衝突。大多數人沒有意識到我們生活在一個多麼和平的時代。我們中沒有人活在一千年前，所以我們很容易忘記這個世界曾經更加暴力。隨著戰爭變得更加罕見，它們吸引了更多的關注。更多的人關注當今在阿富汗和伊拉克爆發的戰爭，而不是大多數巴西人和印度人生活在和平中。

Even more importantly, it's easier to relate to the suffering of individuals than of entire populations. However, in order to understand macro-historical processes, we need to examine mass statistics rather than individual stories. In the year 2000, wars caused the deaths of 310,000 individuals, and violent crime killed another 520,000. Each and every victim is a world destroyed, a

family ruined, friends and relatives scarred for life. Yet from a macro perspective these 830,000 victims comprised only 1.5 per cent of the 56 million people who died in 2000. That year 1.26 million people died in car accidents (2.25 per cent of total mortality) and 815,000 people committed suicide (1.45 per cent).⁴

The figures for 2002 are even more surprising. Out of 57 million dead, only 172,000 people died in war and 569,000 died of violent crime (a total of 741,000 victims of human violence). In contrast, 873,000 people committed suicide.⁵ It turns out that in the year following the 9/11 attacks, despite all the talk of terrorism and war, the average person was more likely to kill himself than to be killed by a terrorist, a soldier or a drug dealer.

更重要的是，我們比起整個人口更容易與個人的苦難產生共鳴。然而，為了理解宏觀歷史過程，我們需要檢視大量統計數據，而非個人的故事。在2000年，戰爭造成了31萬人的死亡，暴力犯罪又致使另外52萬人死亡。每一位受害者都是一個被摧毀的世界，一個被毀滅的家庭，朋友和親戚終身受傷。然而，從宏觀的角度來看，這830,000個受害者僅佔2000年死亡人數的1.5%。那一年，有1.26百萬人死於車禍（佔總死亡率的2.25%），815,000人自殺（佔1.45%）。⁴ 2002年的數據更加驚人。在5700萬人的死亡中，僅有17.2萬人在戰爭中死亡，569,000人因暴力犯罪而死亡（總共741,000人受到人類暴力的影響）。相比之下，有873,000人自殺。⁵ 結果表明，在911事件發生後的一年裡，儘管一切有關恐怖主義和戰爭的言論，普通人自殺的概率比被恐怖分子、士兵或毒販殺死的概率更高。

In most parts of the world, people go to sleep without fearing that in the middle of the night a neighbouring tribe might surround their village and slaughter everyone. Well-off British subjects travel daily from Nottingham to London through Sherwood Forest without fear that a gang of merry green-clad brigands will ambush them and take their money to give to the poor (or, more likely, murder them and take the money for themselves). Students brook no canings from their teachers, children need not fear that they will be sold into slavery when their parents can't pay their bills, and women know that the law forbids their husbands from beating them and forcing them to stay at home. Increasingly, around the world, these expectations are fulfilled.

The decline of violence is due largely to the rise of the state. Throughout history, most violence resulted from local feuds between families and communities. (Even today, as the above figures indicate, local crime is a far deadlier threat than international wars.) As we have seen, early farmers, who knew no political organisations larger than the local community, suffered rampant violence.⁶ As kingdoms and empires became stronger, they reined in communities and the level of violence decreased. In the decentralised kingdoms of medieval Europe, about twenty to forty people were murdered each year for every 100,000 inhabitants. In recent decades, when states and markets have become all-powerful and communities have vanished, violence rates have dropped even further. Today the global average is only nine murders a year per 100,000 people, and most of these murders take place in weak states such as Somalia and Colombia. In the centralised states of Europe, the average is one murder a year per 100,000 people.⁷

世界大部分地區的人們在入睡時不用擔心鄰近的部落會在半夜包圍他們的村莊並屠殺所有人。英國有錢的公民們每天從諾丁漢到倫敦路上穿越著舍伍德森林，他們不用擔心一群綠衣盜匪會埋伏他們並拿走他們的錢給窮人（或者更可能的是殺死他們並拿走錢）。學生不再忍受老師的鞭打，孩子不必擔心當他們的父母無法支付帳單時被賣到奴隸制度之下，而女性則知道法律禁止其丈夫打她並強迫她待在家中。愈來愈多的人在全球範圍內享有這些期望。暴力的下降在很大程度上歸因於國家的崛起。歷史上，大部分的暴力都源於家庭和社區之間的地方爭端。（即使今天，如上述數字所示，當地犯罪也比國際戰爭更加致命。）正如我們所看到的，早期農民除了當地社區之外，不認識更大的政治組織，他們遭受了猖獗的暴力。隨著王國和帝國變得更加強大，他們約束了社區，暴力水平下降了。在中世紀的分權王國中，每年有20到40人被謀殺，對於每100,000名居民而言。在最近幾十年中，當國家和市場變得全能，社區消失時，暴力率進一步下降。如今，全球平均每年僅有9起謀殺案發生，每10萬人中有一起，其中大部分發生在像索馬里和哥倫比亞等虛弱國家。在歐洲的中央集權國家，平均每年每100,000人中只有一起謀殺案。

There are certainly cases where states use their power to kill their own citizens, and these often loom large in our memories and fears. During the twentieth century, tens of millions if not hundreds of millions of people were

killed by the security forces of their own states. Still, from a macro perspective, state-run courts and police forces have probably increased the level of security worldwide. Even in oppressive dictatorships, the average modern person is far less likely to die at the hands of another person than in premodern societies. In 1964 a military dictatorship was established in Brazil. It ruled the country until 1985. During these twenty years, several thousand Brazilians were murdered by the regime. Thousands more were imprisoned and tortured. Yet even in the worst years, the average Brazilian in Rio de Janeiro was far less likely to die at human hands than the average Waorani, Arawete or Yanomamo. The Waorani, Arawete and Yanomamo are indigenous people who live in the depths of the Amazon forest, without army, police or prisons. Anthropological studies have indicated that between a quarter and a half of their menfolk die sooner or later in violent conflicts over property, women or prestige.⁸

國家有時會利用其權力殺害自己的公民，在我們的記憶和恐懼中，這些情況往往佔據了大部分空間。在20世紀，無數人遭到自己國家的安全部隊殺害，死亡人數可以達到數千萬，甚至數億。然而，從宏觀角度而言，國家所運行的法院和警察力量可能已經提高了全球的安全水平。即使在壓迫的獨裁政權下，現代人也比在前現代社會裡更不容易死於他人之手。巴西在1964年建立了一個軍事獨裁政權，一直統治國家直至1985年。在這二十年間，數千名巴西人被政權殺害，成千上萬人被監禁和折磨。然而，即使在最糟糕的年月，里約熱內盧的普通巴西人死於人類之手的概率仍然遠低於瓦奧拉尼、阿拉韋特或亞諾馬莫等原住民身上。瓦奧拉尼、阿拉韋特和亞諾馬莫是生活在亞馬遜深處、沒有軍隊、警察或監獄的原住民。人類學研究表明，在爭取財產、女人或威望的暴力衝突中，他們四分之一甚至一半的男性最終都會死亡。

Imperial Retirement

It is perhaps debatable whether violence within states has decreased or increased since 1945. What nobody can deny is that international violence has dropped to an all-time low. Perhaps the most obvious example is the collapse of the European empires. Throughout history empires have crushed rebellions with an iron fist, and when its day came, a sinking empire used all

its might to save itself, usually collapsing into a bloodbath. Its final demise generally led to anarchy and wars of succession. Since 1945 most empires have opted for peaceful early retirement. Their process of collapse became relatively swift, calm and orderly.

In 1945 Britain ruled a quarter of the globe. Thirty years later it ruled just a few small islands. In the intervening decades it retreated from most of its colonies in a peaceful and orderly manner. Though in some places such as Malaya and Kenya the British tried to hang on by force of arms, in most places they accepted the end of empire with a sigh rather than with a temper tantrum. They focused their efforts not on retaining power, but on transferring it as smoothly as possible. At least some of the praise usually heaped on Mahatma Gandhi for his non-violent creed is actually owed to the British Empire. Despite many years of bitter and often violent struggle, when the end of the Raj came, the Indians did not have to fight the British in the streets of Delhi and Calcutta. The empire's place was taken by a slew of independent states, most of which have since enjoyed stable borders and have for the most part lived peacefully alongside their neighbours. True, tens of thousands of people perished at the hands of the threatened British Empire, and in several hot spots its retreat led to the eruption of ethnic conflicts that claimed hundreds of thousands of lives (particularly in India). Yet when compared to the long-term historical average, the British withdrawal was an exemplar of peace and order. The French Empire was more stubborn. Its collapse involved bloody rearguard actions in Vietnam and Algeria that cost hundreds of thousands of lives. Yet the French, too, retreated from the rest of their dominions quickly and peacefully, leaving behind orderly states rather than a chaotic free-for-all.

自1945年以来，各国内部的暴力是否增加或减少存在争议。然而，没有人可以否认的是，国际暴力已经降至历史最低。最明显的例子或许是欧洲帝国的崩溃。在历史上，帝国总是用铁腕镇压叛乱，而当它的日子到来时，沉没的帝国会动用所有的力量来自救，往往导致血腥的崩溃。它的最终消亡通常会导致无政府状态和王位继承战争。自1945年以来，大多数帝国已选择和平退休。它们的崩溃过程变得相对迅速、平静和有序。1945年，英国统治着全球四分之一的领土。三十年后，它只统治了几个小岛。在这些年里，英国以和平有序的方式从其大部分殖民地撤退。尽管在马来亚和肯尼亚等地方，英国试图通过武

力维持统治，但在大多数地方，他们接受了帝国的终结，发出了一声叹息而不是发脾气。他们的努力并不是为了保持权力，而是为了尽可能平稳地转移权力。马哈特玛·甘地的非暴力信条通常被誉为印度独立和平运动的标志，但至少有一些表彰应归功于英国帝国。尽管经历了多年的激烈而常常是暴力的斗争，但当Raj的终结到来时，印度人不必在德里和加尔各答的街道上与英国人作战。该帝国的地位被一系列独立国家取代，其中大多数国家已经享有稳定的边界并且在很大程度上与他们的邻国和平相处。当然，数以万计的人在受到威胁的英国帝国的手中丧生，而在几个热点地区，其撤退导致了爆发民族冲突，造成数十万人死亡（特别是在印度）。然而，与长期历史平均水平相比，英国的撤退是和平和有序的例子。法国帝国则更为倔强，其崩溃涉及在越南和阿尔及利亚进行的血腥的后卫行动，造成数十万人死亡。然而，法国也很快和平地从其余领土撤退，留下了有序的国家，而不是混乱的自由竞争。

The Soviet collapse in 1989 was even more peaceful, despite the eruption of ethnic conflict in the Balkans, the Caucasus and Central Asia. Never before has such a mighty empire disappeared so swiftly and so quietly. The Soviet Empire of 1989 had suffered no military defeat except in Afghanistan, no external invasions, no rebellions, nor even large-scale Martin Luther King-style campaigns of civil disobedience. The Soviets still had millions of soldiers, tens of thousands of tanks and aeroplanes, and enough nuclear weapons to wipe out the whole of humankind several times over. The Red Army and the other Warsaw Pact armies remained loyal. Had the last Soviet ruler, Mikhail Gorbachev, given the order, the Red Army would have opened fire on the subjugated masses.

1989年蘇聯崩潰的過程相對和平，儘管巴爾幹、高加索和中亞地區爆發了種族衝突。從未有如此強大的帝國這麼迅速而寧靜地消失。1989年的蘇聯帝國除了在阿富汗戰爭中失敗外，沒有遭受過任何外部入侵、起義，甚至大規模像馬丁·路德·金式的公民不服從活動也沒有。蘇聯仍然有數百萬士兵、數萬輛坦克和飛機以及足夠的核武器，可以多次摧毀整個人類。紅軍和其他華沙公約軍隊仍然忠誠。如果當時的蘇聯領導人戈爾巴喬夫下令，紅軍會向被征服的人群開火。

Yet the Soviet elite, and the Communist regimes through most of eastern Europe (Romania and Serbia were the exceptions), chose not to use even a

tiny fraction of this military power. When its members realised that Communism was bankrupt, they renounced force, admitted their failure, packed their suitcases and went home. Gorbachev and his colleagues gave up without a struggle not only the Soviet conquests of World War Two, but also the much older tsarist conquests in the Baltic, the Ukraine, the Caucasus and Central Asia. It is chilling to contemplate what might have happened if Gorbachev had behaved like the Serbian leadership – or like the French in Algeria.

Pax Atomica

The independent states that came after these empires were remarkably uninterested in war. With very few exceptions, since 1945 states no longer invade other states in order to conquer and swallow them up. Such conquests had been the bread and butter of political history since time immemorial. It was how most great empires were established, and how most rulers and populations expected things to stay. But campaigns of conquest like those of the Romans, Mongols and Ottomans cannot take place today anywhere in the world. Since 1945, no independent country recognised by the UN has been conquered and wiped off the map. Limited international wars still occur from time to time, and millions still die in wars, but wars are no longer the norm.

然而，苏联精英和大多数中欧的共产主义政权（罗马尼亚和塞尔维亚是例外），选择不使用即使是军事力量的一小部分。当他们的成员意识到共产主义已经破产，他们放弃了武力，承认了他们的失败，打包他们的行李回家。戈尔巴乔夫及其同事不仅放弃了二战中苏联的征服，而且放弃了波罗的海，乌克兰，高加索和中亚更古老的沙皇征服。如果戈尔巴乔夫像塞尔维亚领导层或阿尔及利亚的法国一样行事，那么结果可能是十分恐怖的。这些帝国之后出现的独立国家对战争非常不感兴趣。自1945年以来，除了极少例外，州不再侵犯其他州以征服和吞噬它们。这些征服一直是政治史上的衣食父母，已经存在了很长时间。这是大多数伟大帝国建立的方式，也是大多数统治者和人民希望保持的方式。但像罗马人，蒙古人和奥斯曼人那样的征服运动在世界上任何地方都无法再次发生。自1945年以来，联合国承认的独立国家没有被征服并从地图上抹除。国际有限战争仍然偶尔发生，数百万人仍然在战争中死亡，但战争不再是规范。

Many people believe that the disappearance of international war is unique to the rich democracies of western Europe. In fact, peace reached Europe after it prevailed in other parts of the world. Thus the last serious international wars between South American countries were the Peru-Ecuador War of 1941 and the Bolivia-Paraguay War of 1932–5. And before that there hadn't been a serious war between South American countries since 1879–84, with Chile on one side and Bolivia and Peru on the other.

We seldom think of the Arab world as particularly peaceful. Yet only once since the Arab countries won their independence has one of them mounted a full-scale invasion of another (the Iraqi invasion of Kuwait in 1990). There have been quite a few border clashes (e.g. Syria vs Jordan in 1970), many armed interventions of one in the affairs of another (e.g. Syria in Lebanon), numerous civil wars (Algeria, Yemen, Libya) and an abundance of coups and revolts. Yet there have been no full-scale international wars among the Arab states except the Gulf War. Even widening the scope to include the entire Muslim world adds only one more example, the Iran-Iraq War. There was no Turkey—Iran War, Pakistan-Afghanistan War, or Indonesia-Malaysia War.

許多人相信國際戰爭的消失僅發生在西歐富裕的民主國家中。實際上，和平先在世界其他地方獲得，然後才傳到歐洲。因此，南美國家間的最後一場嚴重國際戰爭是1941年的秘魯-厄瓜多爾戰爭和1932-35年的玻利維亞-巴拉圭戰爭。在那之前，南美國家間自1879-84年，智利一方和玻利維亞、秘魯另一方爆發嚴重戰爭以來，就再也沒有發生過嚴重的戰爭。我們很少認為阿拉伯世界尤其和平。然而，自阿拉伯國家贏得獨立以來，只有一次出現全面入侵他國的情況，那就是伊拉克於1990年入侵科威特。雖然邊境衝突屢次發生（如1970年的敘利亞對約旦），許多國家互相干預他國事務（如敘利亞在黎巴嫩），許多內戰（阿爾及利亞、也門、利比亞）和大量的政變和起義，但除了海灣戰爭外，阿拉伯國家之間並沒有發生過全面性的國際戰爭。即使將範圍擴大到整個穆斯林世界，只增加了一個例子：伊朗-伊拉克戰爭。沒有土耳其-伊朗戰爭，巴基斯坦-阿富汗戰爭，也不是印尼和馬來西亞之間的戰爭。

In Africa things are far less rosy. But even there, most conflicts are civil wars and coups. Since African states won their independence in the 1960s

and 1970s, very few countries have invaded one another in the hope of conquest.

There have been periods of relative calm before, as, for example, in Europe between 1871 and 1914, and they always ended badly. But this time it is different. For real peace is not the mere absence of war. Real peace is the implausibility of war. There has never been real peace in the world.

Between 1871 and 1914, a European war remained a plausible eventuality, and the expectation of war dominated the thinking of armies, politicians and ordinary citizens alike. This foreboding was true for all other peaceful periods in history. An iron law of international politics decreed, ‘For every two nearby polities, there is a plausible scenario that will cause them to go to war against one another within one year.’ This law of the jungle was in force in late nineteenth-century Europe, in medieval Europe, in ancient China and in classical Greece. If Sparta and Athens were at peace in 450 BC, there was a plausible scenario that they would be at war by 449 BC.

非洲的情況並不如理想。但即使在那裡，大多數衝突都是內戰和政變。自非洲國家在1960年代和1970年代贏得獨立以來，很少有國家互相侵略以求征服。以前也有相對平靜的時期，例如在1871年至1914年的歐洲，但最終都以悲劇收場。但這一次不一樣，因為真正的和平不僅僅是戰爭的缺席。真正的和平是戰爭的不可能性。世界上從來沒有真正的和平。在1871年至1914年期間，歐洲戰爭仍然是一個可能發生的事件，戰爭的期望支配了軍隊、政治家和普通公民的思維。這種預感在歷史上的所有其他和平時期也是真實存在的。國際政治的鐵律規定：“對於每兩個相鄰的政體，都有一個可信的情景，會使它們在一年內互相開戰。”這種叢林法則曾在19世紀末的歐洲、中世紀的歐洲、古代中國和古典希臘都有所體現。如果斯巴達和雅典在公元前450年時處於和平狀態，那麼可能在公元前449年就會開戰。

Today humankind has broken the law of the jungle. There is at last real peace, and not just absence of war. For most polities, there is no plausible scenario leading to full-scale conflict within one year. What could lead to war between Germany and France next year? Or between China and Japan? Or between Brazil and Argentina? Some minor border clash might occur, but only a truly apocalyptic scenario could result in an old-fashioned full-scale war between Brazil and Argentina in 2014, with Argentinian armoured

divisions sweeping to the gates of Rio, and Brazilian carpet-bombers pulverising the neighbourhoods of Buenos Aires. Such wars might still erupt between several pairs of states, e.g. between Israel and Syria, Ethiopia and Eritrea, or the USA and Iran, but these are only the exceptions that prove the rule.

今天，人類打破了叢林法則。現在已經有真正的和平，而不僅僅是戰爭的缺席。對於大多數政治體系來說，沒有任何可能導致一年內全面衝突的情況。什麼可能會在明年導致德國和法國之間的戰爭？或中日之間？或巴西和阿根廷之間？可能會發生一些小的邊境衝突，但只有真正的啟示性情節才能導致2014年巴西和阿根廷之間的傳統全面戰爭，阿根廷裝甲師團席捲里約的城門，巴西的地毯式轟炸機轟炸布宜諾斯艾利斯的社區。此類戰爭仍可能在幾對國家之間爆發，例如以色列和敘利亞，埃塞俄比亞和厄立特里亞，或美國和伊朗之間的戰爭，但這些僅是證實規則的異常情況。

This situation might of course change in the future and, with hindsight, the world of today might seem incredibly naïve. Yet from a historical perspective, our very naïvety is fascinating. Never before has peace been so prevalent that people could not even imagine war.



Scholars have sought to explain this happy development in more books and articles than you would ever want to read yourself, and they have identified

several contributing factors. First and foremost, the price of war has gone up dramatically. The Nobel Peace Prize to end all peace prizes should have been given to Robert Oppenheimer and his fellow architects of the atomic bomb. Nuclear weapons have turned war between superpowers into collective suicide, and made it impossible to seek world domination by force of arms.

這種情況當然可能會在未來發生變化，從回顧的角度來看，當今世界可能會顯得極其天真。然而，從歷史的角度來看，我們的天真非常迷人。從來沒有一個時期如此和平，以至於人們甚至無法想像戰爭。學者們已經在更多的書籍和文章中解釋了這一幸福的發展，但你永遠不會想要閱讀它們，他們已經確定了幾個貢獻因素。首先，戰爭的代價大幅上漲。結束所有和平獎的諾貝爾和平獎應該授予Robert Oppenheimer和他的同事們。核武器使超級大國之間的戰爭變成了集體自殺，並使藉武力尋求世界支配成為不可能。

Secondly, while the price of war soared, its profits declined. For most of history, polities could enrich themselves by looting or annexing enemy territories. Most wealth consisted of fields, cattle, slaves and gold, so it was easy to loot it or occupy it. Today, wealth consists mainly of human capital, technical know-how and complex socio-economic structures such as banks. Consequently it is difficult to carry it off or incorporate it into one's territory.

Consider California. Its wealth was initially built on gold mines. But today it is built on silicon and celluloid – Silicon Valley and the celluloid hills of Hollywood. What would happen if the Chinese were to mount an armed invasion of California, land a million soldiers on the beaches of San Francisco and storm inland? They would gain little. There are no silicon mines in Silicon Valley. The wealth resides in the minds of Google engineers and Hollywood script doctors, directors and special-effects wizards, who would be on the first plane to Bangalore or Mumbai long before the Chinese tanks rolled into Sunset Boulevard. It is not coincidental that the few full-scale international wars that still take place in the world, such as the Iraqi invasion of Kuwait, occur in places where wealth is old-fashioned material wealth. The Kuwaiti sheikhs could flee abroad, but the oil fields stayed put and were occupied.

其次，戰爭的代價攀升，利益卻下降。在歷史的大部分時間裡，政權可以通過掠奪或併吞敵人領土來豐富自己。大部分財富由田地、牲畜、奴隸和金子構成，所以掠奪或佔領很容易。而現今的財富主要是人力資本、技術知識和複雜的社會經濟結構，例如銀行，因此很難搬運或納入自己的領土。以加州為例，它的財富最初是建立在黃金礦上的。但現今，它建立在矽谷和好萊塢的電影業上。如果中國人在加州海灘登陸並向內陸攻擊，他們將獲得的很少。矽谷沒有矽礦。財富在谷歌工程師和好萊塢編劇、導演和特效高手的腦海中，他們會在中國坦克滾進日落大道之前搭上第一班飛往班加羅爾或孟買的飛機。世界上仍然發生一些全面性的國際戰爭，例如伊拉克入侵科威特，都發生在古老物質財富仍領先的地方。科威特酋長可以逃往國外，但石油礦區卻被占領。



43. and 44. Gold miners in California during the Gold Rush, and Facebook's headquarters near San Francisco. In 1849 California built its fortunes on gold. Today, California builds its fortunes on silicon. But whereas in 1849 the gold actually lay there in the Californian soil, the real treasures of Silicon Valley are locked inside the heads of high-tech employees .

While war became less profitable, peace became more lucrative than ever. In traditional agricultural economies long-distance trade and foreign investment were sideshows. Consequently, peace brought little profit, aside from

avoiding the costs of war. If, say, in 1400 England and France were at peace, the French did not have to pay heavy war taxes and to suffer destructive English invasions, but otherwise it did not benefit their wallets. In modern capitalist economies, foreign trade and investments have become all-important. Peace therefore brings unique dividends. As long as China and the USA are at peace, the Chinese can prosper by selling products to the USA, trading in Wall Street and receiving US investments.

43. 和 44. 加利福尼亞淘金熱期間的淘金者，以及 Facebook 總部位於舊金山附近。1849 年，加利福尼亞靠金子建立了自己的財富。今天，加利福尼亞的財富建立在矽谷。但是，1849 年金子實際上存在於加利福尼亞的土壤中，而矽谷的真正寶藏則鎖藏在高科技員工的頭腦中。隨著戰爭利潤減少，和平變得比以往任何時候都更加有利可圖。在傳統的農業經濟中，長途貿易和外國投資只是次要的。因此，和平除了避免戰爭成本外，帶來的利潤很少。假如說在 1400 年時，英國和法國處於和平狀態，法國人不必支付高額的戰爭稅，也不必忍受破壞性的英國入侵，但其財務狀況並不因此受益。在現代資本主義經濟中，國際貿易和投資變得至關重要。因此，和平帶來獨特的紅利。只要中國和美國保持和平狀態，中國人就可以通過向美國出售產品，交易華爾街和接受美國的投資來獲利。

Last but not least, a tectonic shift has taken place in global political culture. Many elites in history – Hun chieftains, Viking noblemen and Aztec priests, for example – viewed war as a positive good. Others viewed it as evil, but 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.

最後，全球政治文化發生了天翻地覆的變化。在歷史上，許多精英-例如匈奴酋長、維京貴族和阿茲特克祭司-認為戰爭是一種積極的好事。其他人認為它是邪惡的，但又是不可避免的，我們最好利用它來為自己帶來好處。我們是歷史上第一次由和平愛好者精英-政治家、商人、知識分子和藝術家-主宰的世界，他們真正將戰爭視為邪惡和可避免的。（過去有和平主義者，例如早期的基督徒，但在他們獲得權力的罕見情況下，他們往往會忘記自己的“另一邊臉”的要求。）這四個因素之間存在積極的反饋循環。核戰威脅促進了和平主義；當和平主義傳播時，戰爭消退，貿易繁榮；而貿易增加了和平的利潤和戰爭的代價。隨著時間的推移，這種反饋循環創造了另一個阻礙戰爭的障礙，最終可能被證明是最重要的阻礙。國際關係網越來越緊密，削弱了大多數國家的獨立性，降低了任何一個國家單獨放開戰爭的機會。大多數國家不再因為獨立而進行全面戰爭。儘管以色列、意大利、墨西哥或泰國的公民可能抱著獨立的幻想，但事實是他們的政府無法獨立進行經濟或外交政策，當然也不可能獨立發起和進行全面戰爭。正如第十一章所解釋的那樣，我們正見證一個全球帝國的形成。和先前的帝國一樣，這個帝國也維持境內和平。由於其邊界覆蓋全球，這個世界帝國有效地維持世界和平。

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.

To satisfy both optimists and pessimists, we may conclude by saying that we are on the threshold of both heaven and hell, moving nervously between the gateway of the one and the anteroom of the other. History has still not decided where we will end up, and a string of coincidences might yet send us rolling in either direction.

現代時代是一個無意義的屠殺、戰爭和壓迫時代，以第一次世界大戰中的戰壕，廣島核蘑菇雲和希特勒和斯大林的血腥狂熱為代表嗎？還是一個和平的時代，以南美從未挖掘的戰壕，莫斯科和紐約從未出現的蘑菇雲，以及馬漢德拉·甘地和馬丁·路德·金的平靜面容為代表？答案取決於時間。我們的過去觀點通常是由最近幾年的事件所扭曲的，這是令人警醒的。如果這一章是在1945年或1962年寫的，它可能會更加憂鬱。由於是在2014年寫的，它對現代歷史採取了相對較樂觀的態度。為了滿足樂觀主義者和悲觀主義者，我們可以總結說，我們處於天堂和地獄的門檻之間，神經兮兮地在兩者之間移動。歷史仍未決定我們最終會以何種方式結束，一系列巧合可能會將我們帶向任何一個方向。

* An ‘intimate community’ is a group of people who know one another well and depend on each other for survival.

「密切社群」是指一群人互相了解，並且彼此相依相存以求生存的社群。

And They Lived Happily Ever After

THE LAST 500 YEARS HAVE WITNESSED A breathtaking series of revolutions. The earth has been united into a single ecological and historical sphere. The economy has grown exponentially, and humankind today enjoys the kind of wealth that used to be the stuff of fairy tales. Science and the Industrial Revolution have given humankind superhuman powers and practically limitless energy. The social order has been completely transformed, as have politics, daily life and human psychology.

But are we happier? Did the wealth humankind accumulated over the last five centuries translate into a new-found contentment? Did the discovery of inexhaustible energy resources open before us inexhaustible stores of bliss? Going further back, have the seventy or so turbulent millennia since the Cognitive Revolution made the world a better place to live? Was the late Neil Armstrong, whose footprint remains intact on the windless moon, happier than the nameless hunter-gatherer who 30,000 years ago left her handprint on a wall in Chauvet Cave? If not, what was the point of developing agriculture, cities, writing, coinage, empires, science and industry?

過去500年見證了一連串驚人的革命。地球已經統一成一個生態和歷史的領域。經濟呈指數級增長，今天的人類享受著過去只存在於童話故事中的財富。科學和工業革命賦予了人類超越常人的力量和幾乎無限的能源。社會秩序已經完全改變，政治、日常生活和人的心理狀態也隨之而變。但是，我們快樂嗎？過去五個世紀累積的財富是否轉化為新的滿足？無盡能源資源的發現是否為我們帶來無盡的幸福？更往前走，自認知革命以來的七十多年是否讓世界變得更美好？為什麼要發展農業、城市、文字、貨幣、帝國、科學和工業，如果它們不能讓人

更幸福？尼爾·阿姆斯特朗後期是否比30,000年前在肖維洞穴牆壁上留下手印的無名狩獵者更幸福？

Historians seldom ask such questions. They do not ask whether the citizens of Uruk and Babylon were happier than their foraging ancestors, whether the rise of Islam made Egyptians more pleased with their lives, or how the collapse of the European empires in Africa have influenced the happiness of countless millions. Yet these are the most important questions one can ask of history. Most current ideologies and political programmes are based on rather flimsy ideas concerning the real source of human happiness.

Nationalists believe that political self-determination is essential for our happiness. Communists postulate that everyone would be blissful under the dictatorship of the proletariat. Capitalists maintain that only the free market can ensure the greatest happiness of the greatest number, by creating economic growth and material abundance and by teaching people to be self-reliant and enterprising.

歷史學家很少提出這種問題。他們不問烏魯克和巴比倫的市民是否比其狩獵祖先更幸福，伊斯蘭教的崛起是否讓埃及人對他們的生活更滿意，或者歐洲帝國在非洲的崩潰如何影響數以百萬計人的幸福。然而，這些是可以問到歷史上最重要的問題。大多數目前的意識形態和政治方案都是基於對人類幸福真正來源的脆弱想法。民族主義者相信政治自決對我們的幸福至關重要。共產主義者假設在無產階級專政下每個人都會快樂。資本主義者認為只有自由市場才能確保最大數量的人的最大幸福，通過創造經濟增長和物質豐富，並教導人們自力更生和創業。

What would happen if serious research were to disprove these hypotheses? If economic growth and self-reliance do not make people happier, what's the benefit of Capitalism? What if it turns out that the subjects of large empires are generally happier than the citizens of independent states and that, for example, Algerians were happier under French rule than under their own? What would that say about the process of decolonisation and the value of national self-determination?

These are all hypothetical possibilities, because so far historians have avoided raising these questions – not to mention answering them. They have

researched the history of just about everything politics, society, economics, gender, diseases, sexuality, food, clothing – yet they have seldom stopped to ask how these influence human happiness.

如果嚴肅的研究推翻了這些假設，會發生什麼？如果經濟增長和自給自足不能讓人們更快樂，那麼資本主義有什麼好處？如果證明大帝國的居民通常比獨立國家的公民更幸福，例如阿爾及利亞人在法國統治下比在自己的國家更幸福，那麼這意味著去殖民化過程和民族自決的價值是什麼？這些都是假設性的可能性，因為到目前為止，歷史學家已避免提出這些問題 - 更不用說回答它們了。他們研究了幾乎所有政治，社會，經濟，性別，疾病，性愛，食物，衣服等歷史，但他們鮮少停下來問這些如何影響人類幸福的問題。

Though few have studied the long-term history of happiness, almost every scholar and layperson has some vague preconception about it. In one common view, human capabilities have increased throughout history. Since humans generally use their capabilities to alleviate miseries and fulfil aspirations, it follows that we must be happier than our medieval ancestors, and they must have been happier than Stone Age hunter-gatherers.

But this progressive account is unconvincing. As we have seen, new aptitudes, behaviours and skills do not necessarily make for a better life. When humans learned to farm in the Agricultural Revolution, their collective power to shape their environment increased, but the lot of many individual humans grew harsher. Peasants had to work harder than foragers to eke out less varied and nutritious food, and they were far more exposed to disease and exploitation. Similarly, the spread of European empires greatly increased the collective power of humankind, by circulating ideas, technologies and crops, and opening new avenues of commerce. Yet this was hardly good news for millions of Africans, Native Americans and Aboriginal Australians. Given the proven human propensity for misusing power, it seems naïve to believe that the more clout people have, the happier they will be.

雖然很少有人研究幸福的長期歷史，但幾乎每位學者和普通人都對此有某種模糊的先入為主觀念。在一種普遍的觀點中，人類的能力在歷史上得到了增強。由於人們通常利用他們的能力來減輕痛苦和實現渴望，所以我們必須比我們的中世紀祖先更快樂，而他們必須比石器時

代的獵人採集者更快樂。但這種進步的說法並不令人信服。正如我們所看到的，新的才能、行為和技能並不一定會讓生活更美好。當人類在農業革命中學會耕作時，他們塑造環境的能力增加了，但許多個別人的生活變得更加艱難。農民必須比獵人採集者更努力地工作，才能獲得較少變化和營養不良的食物，而且他們更容易受到疾病和剝削的影響。同樣地，歐洲帝國的擴張大大增加了人類的集體力量，通過傳播思想、技術和作物，開拓了新的商業途徑。然而，對於數百萬非洲人、美洲原住民和澳洲土著人來說，這並不是好消息。考慮到已知的人類濫用權力的傾向，認為人們擁有的權力越多，他們就越快樂，這似乎是天真的。

Some challengers of this view take a diametrically opposed position. They argue for a reverse correlation between human capabilities and happiness. Power corrupts, they say, and as humankind gained more and more power, it created a cold mechanistic world ill-suited to our real needs. Evolution moulded our minds and bodies to the life of hunter-gatherers. The transition first to agriculture and then to industry has condemned us to living unnatural lives that cannot give full expression to our inherent inclinations and instincts, and therefore cannot satisfy our deepest yearnings. Nothing in the comfortable lives of the urban middle class can approach the wild excitement and sheer joy experienced by a forager band on a successful mammoth hunt. Every new invention just puts another mile between us and the Garden of Eden.

這個觀點的一些挑戰者持有完全相反的立場。他們認為人類能力和幸福之間存在著反向相關。他們認為權力會使人墮落，當人類擁有越來越多的權力時，就創造了一個不適合我們真正需求的冷酷機械世界。進化塑造了我們的心智和身體，以適應獵人採集者的生活方式。從農業到工業的轉變，將我們貶低為無法充分表達我們固有傾向和本能的非自然生活，因此無法滿足我們最深刻的渴望。城市中產階級舒適的生活中沒有任何一件事可以像成功的獵象隊那樣帶來野蠻的興奮和純粹的喜悅。每一個新發明只會在我們和伊甸園之間增加一英里的距離。

Yet this romantic insistence on seeing a dark shadow behind each invention is as dogmatic as the belief in the inevitability of progress. Perhaps we are out of touch with our inner hunter-gatherer, but it's not all bad. For instance,

over the last two centuries modern medicine has decreased child mortality from 33 per cent to less than 5 per cent. Can anyone doubt that this made a huge contribution to the happiness not only of those children who would otherwise have died, but also of their families and friends?

A more nuanced position takes the middle road. Until the Scientific Revolution there was no clear correlation between power and happiness. Medieval peasants may indeed have been more miserable than their hunter-gatherer forebears. But in the last few centuries humans have learned to use their capacities more wisely. The triumphs of modern medicine are just one example. Other unprecedented achievements include the steep drop in violence, the virtual disappearance of international wars, and the near elimination of large-scale famines.

然而，對每一個發明都看到暗影的這種浪漫主義堅持，就像相信進步的必然性一樣教條主義。也許我們與我們內在的獵人採集者失去了聯繫，但這並不是完全不好的。例如，過去兩個世紀現代醫學已將兒童死亡率從33%降至不到5%。有誰能懷疑這對那些本來會死亡的孩子、以及他們的家人和朋友的幸福產生了巨大貢獻？一個更加微妙的立場採取了中庸之道。直到科學革命之前，權力和幸福之間沒有明顯的相關性。中世紀農民確實可能比他們的獵人採集祖先更加悲慘。但在過去幾個世紀中，人類已經學會更加明智地利用自己的能力。現代醫學的勝利只是一個例子。其他空前的成就包括暴力猛降，國際戰爭幾乎消失，大規模的饑荒幾乎消失。

Yet this, too, is an oversimplification. Firstly, it bases its optimistic assessment on a very small sample of years. The majority of humans began to enjoy the fruits of modern medicine no earlier than 1850, and the drastic drop in child mortality is a twentieth-century phenomenon. Mass famines continued to blight much of humanity up to the middle of the twentieth century. During Communist China's Great Leap Forward of 1958–61, somewhere between 10 and 50 million human beings starved to death. International wars became rare only after 1945, largely thanks to the new threat of nuclear annihilation. Hence, though the last few decades have been an unprecedented golden age for humanity, it is too early to know whether this represents a fundamental shift in the currents of history or an ephemeral eddy of good fortune. When judging modernity, it is all too tempting to take

the viewpoint of a twenty-first-century middle-class Westerner. We must not forget the viewpoints of a nineteenth-century Welsh coal miner, Chinese opium addict or Tasmanian Aborigine. Truganini is no less important than Homer Simpson.

然而，這樣說也過於簡化了。首先，它基於一個很小的樣本年份來作出樂觀的評估。大多數人只有在 1850 年之後才開始享受現代醫療帶來的成果，而兒童死亡率的急劇下降是二十世紀的現象。大規模的饑荒仍然困擾著許多人類直到二十世紀中葉。在中國共產黨的大躍進期間（1958-1961），約有1,000萬到5,000萬人因饑荒而死亡。國際戰爭之後的 1945 年才變得罕見，這主要得益於核毀滅的新威脅。因此，儘管過去幾十年對人類來說是前所未有的黃金時代，但我們還不知道這是否代表了歷史潮流的根本性轉變，或者只是一時的好運。在評價現代性時，很容易採取 21 世紀中產階級西方人的觀點。我們不應該忘記十九世紀的威爾士煤礦工人、中國的鴉片成癮者或塔斯馬尼亞土著的觀點。Truganini 也不比 Homer Simpson 不重要。

Secondly, even the brief golden age of the last half-century may turn out to have sown the seeds of future catastrophe. Over the last few decades, we have been disturbing the ecological equilibrium of our planet in myriad new ways, with what seem likely to be dire consequences. A lot of evidence indicates that we are destroying the foundations of human prosperity in an orgy of reckless consumption.

Finally, we can congratulate ourselves on the unprecedented accomplishments of modern Sapiens only if we completely ignore the fate of all other animals. Much of the vaunted material wealth that shields us from disease and famine was accumulated at the expense of laboratory monkeys, dairy cows and conveyor-belt chickens. Over the last two centuries tens of billions of them have been subjected to a regime of industrial exploitation whose cruelty has no precedent in the annals of planet Earth. If we accept a mere tenth of what animal-rights activists are claiming, then modern industrial agriculture might well be the greatest crime in history. When evaluating global happiness, it is wrong to count the happiness only of the upper classes, of Europeans or of men. Perhaps it is also wrong to consider only the happiness of humans.

第二，即使過去的半個世紀是短暫的黃金時代，也可能會種下未來災難的種子。在過去的幾十年裡，我們以無數新的方式打破了地球的生態平衡，可能會帶來嚴重的後果。許多證據表明，我們正在通過肆無忌憚的消費浪潮摧毀人類繁榮的基礎。最後，如果我們完全忽略了其他動物的命運，才能祝賀現代智人的史無前例的成就。我們被噬病和飢餓所掩蓋的很多華麗的物質財富是以實驗室猴子，牛奶牛和傳送帶上的雞為代價積累的。在過去的兩個世紀中，已有數十億只動物遭受了工業開發的壓榨方式，其殘忍程度在地球史上無可比擬。如果我們接受動物權利活動家所聲稱的僅僅十分之一，那麼現代工業農業很可能史是上最大的罪行。在評估全球幸福感時，僅考慮上層階級、歐洲人或男性的幸福是錯誤的。也許僅考慮人類的幸福也是不正確的。

Counting Happiness

So far we have discussed happiness as if it were largely a product of material factors, such as health, diet and wealth. If people are richer and healthier, then they must also be happier. But is that really so obvious? Philosophers, priests and poets have brooded over the nature of happiness for millennia, and many have concluded that social, ethical and spiritual factors have as great an impact on our happiness as material conditions. Perhaps people in modern affluent societies suffer greatly from alienation and meaninglessness despite their prosperity. And perhaps our less well-to-do ancestors found much contentment in community, religion and a bond with nature.

In recent decades, psychologists and biologists have taken up the challenge of studying scientifically what really makes people happy. Is it money, family, genetics or perhaps virtue? The first step is to define what is to be measured. The generally accepted definition of happiness is 'subjective well-being'. Happiness, according to this view, is something I feel inside myself, a sense of either immediate pleasure or long-term contentment with the way my life is going. If it's something felt inside, how can it be measured from outside? Presumably, we can do so by asking people to tell us how they feel. So psychologists or biologists who want to assess how happy people feel give them questionnaires to fill out and tally the results.

到目前為止，我們已經把幸福當作主要來自於物質因素，例如健康、飲食和財富。如果人們更富有和更健康，那麼他們肯定也更幸福。但這真的那麼明顯嗎？哲學家、神職人員和詩人們已經思考了千年幸福的本質，許多人得出結論，社會、道德和精神因素對我們的幸福有同樣大的影響力。也許現代豐裕社會中的人們儘管擁有財富，但他們還是極其孤獨和空虛。而我們不那麼富裕的祖先在社區、宗教和與大自然的聯繫中，卻找到了很多滿足感。近幾十年來，心理學家和生物學家開始進行科學研究，探究是什麼讓人們真正感到幸福。是金錢、家庭、基因或是美德？第一步是定義需要測量的東西。普遍接受的幸福定義是“主觀幸福感”。根據這個觀點，幸福是我內心感受到的東西，我對生活在當下時便感到快樂或對生活在長期中感到滿足。如果這是一種內在的感受，怎麼能夠從外部測量呢？我們可以請人們告訴我們他們的感受。因此，想評估人們幸福感的心理學家或生物學家會讓人們填寫問卷，並總結結果。

A typical subjective well-being questionnaire asks interviewees to grade on a scale of zero to ten their agreement with statements such as 'I feel pleased with the way I am', 'I feel that life is very rewarding', 'I am optimistic about the future' and 'Life is good'. The researcher then adds up all the answers and calculates the interviewee's general level of subjective well-being.

Such questionnaires are used in order to correlate happiness with various objective factors. One study might compare a thousand people who earn \$100,000 a year with a thousand people who earn \$50,000. If the study discovers that the first group has an average subjective well-being level of 8.7, while the latter has an average of only 7.3, the researcher may reasonably conclude that there is a positive correlation between wealth and subjective well-being. To put it in simple English, money brings happiness. The same method can be used to examine whether people living in democracies are happier than people living in dictatorships, and whether married people are happier than singles, divorcees or widowers.

一份典型的主觀幸福感問卷會要求被訪者評分，對於例如「我對自己的生活感到滿意」、「我認為人生非常有意義」、「我對未來感到樂觀」和「生活很美好」等語句是否同意，評分由零到十不等。研究人員再加總所有回答並計算出訪者的主觀幸福感水平。這樣的問卷用於將快樂與各種客觀因素相關聯。一項研究可能比較一千個年收入十萬

美元的人和一千個年收入五萬美元的人。如果研究發現前者的平均主觀幸福感水平為8.7，而後者只有7.3，研究人員可能會合理地得出結論，富裕與主觀幸福感之間存在著積極的關聯。簡單地說，金錢帶來幸福。同樣的方法也可以用來檢驗生活在民主國家的人比生活在獨裁國家的人更幸福，以及已婚人士是否比單身、離婚者或寡婦更幸福。

This provides a grounding for historians, who can examine wealth, political freedom and divorce rates in the past. If people are happier in democracies and married people are happier than divorcees, a historian has a basis for arguing that the democratisation process of the last few decades contributed to the happiness of humankind, whereas the growing rates of divorce indicate an opposite trend.

This way of thinking is not flawless, but before pointing out some of the holes, it is worth considering the findings.

One interesting conclusion is that money does indeed bring happiness. But only up to a point, and beyond that point it has little significance. For people stuck at the bottom of the economic ladder, more money means greater happiness. If you are an American single mother earning \$12,000 a year cleaning houses and you suddenly win \$500,000 in the lottery, you will probably experience a significant and long-term surge in your subjective well-being. You'll be able to feed and clothe your children without sinking further into debt. However, if you're a top executive earning \$250,000 a year and you win \$1 million in the lottery, or your company board suddenly decides to double your salary, your surge is likely to last only a few weeks. According to the empirical findings, it's almost certainly not going to make a big difference to the way you feel over the long run. You'll buy a snazzier car, move into a palatial home, get used to drinking Chateau Pétrus instead of California Cabernet, but it'll soon all seem routine and unexceptional.

提供歷史學家的基礎，可以研究過去的財富、政治自由和離婚率。如果人們在民主國家更幸福，已婚人士比離婚人士更幸福，歷史學家就有根據主張過去幾十年的民主化進程促進了人類的幸福，而不斷增長的離婚率表示了相反的趨勢。這種思維方式並不完美，但在指出一些缺陷之前，值得考慮這些發現。一個有趣的結論是，金錢確實帶來幸福。但只限於一定程度，超過這個程度就沒有多大意義了。對於處於

經濟階梯底部的人來說，更多的錢意味著更大的幸福。如果你是一個賺著每年12,000美元打掃房子的美國單親母親，你突然贏得50萬美元的彩票，你可能會體驗到顯著且長期的幸福感增加。你將能夠養育和穿著你的孩子，而不會進一步陷入債務。然而，如果你是一個賺著每年25萬美元的高級主管，你贏得100萬美元的彩票，或者你公司的董事會突然決定加倍你的薪水，你的幸福感可能只會持續幾個星期。根據實證研究的結果，這幾乎肯定不會對你長期感覺帶來很大的影響。你會買一輛更時髦的車，搬進宮殿般的房子，開始習慣喝 Chateau Pétrus 而不是加利福尼亞卡本內特紅葡萄酒，但這一切很快就會變得平凡和不太例外。

Another interesting finding is that illness decreases happiness in the short term, but is a source of long-term distress only if a person's condition is constantly deteriorating or if the disease involves ongoing and debilitating pain. People who are diagnosed with chronic illness such as diabetes are usually depressed for a while, but if the illness does not get worse they adjust to their new condition and rate their happiness as highly as healthy people do. Imagine that Lucy and Luke are middle-class twins, who agree to take part in a subjective well-being study. On the way back from the psychology laboratory, Lucy's car is hit by a bus, leaving Lucy with a number of broken bones and a permanently lame leg. Just as the rescue crew is cutting her out of the wreckage, the phone rings and Luke shouts that he has won the lottery's \$10,000,000 jackpot. Two years later she'll be limping and he'll be a lot richer, but when the psychologist comes around for a follow-up study, they are both likely to give the same answers they did on the morning of that fateful day.

另一個有趣的發現是，疾病會短期降低幸福感，但只有當一個人的狀況不斷惡化，或疾病持續帶來痛苦時，疾病才是長期悲慘的根源。被診斷患有慢性疾病（如糖尿病）的人通常會暫時感到沮喪，但如果疾病情況沒有惡化，他們會適應自己的新狀況，將幸福感評價得和健康人一樣高。假設Lucy和Luke是中產階級的雙胞胎，他們同意參加主觀幸福感研究。在從心理學實驗室返回的途中，Lucy的車被一輛公交車撞，她的幾根骨頭斷了，腿永遠瘸了。就在救援人員把她從殘骸中割出來的時候，電話響了，Luke大喊他贏得了彩票的1000萬美元頭獎。

兩年後，她將蹣跚而行，而他將更加富有，但當心理學家進行跟進研究時，他們兩人很可能會給出與那個命運日早晨一樣的答案。

Family and community seem to have more impact on our happiness than money and health. People with strong families who live in tight-knit and supportive communities are significantly happier than people whose families are dysfunctional and who have never found (or never sought) a community to be part of. Marriage is particularly important. Repeated studies have found that there is a very close correlation between good marriages and high subjective well-being, and between bad marriages and misery. This holds true irrespective of economic or even physical conditions. An impecunious invalid surrounded by a loving spouse, a devoted family and a warm community may well feel better than an alienated billionaire, provided that the invalid's poverty is not too severe and that his illness is not degenerative or painful.

家庭和社區似乎比金錢和健康對我們的幸福感有更大的影響。家庭和社區緊密聯繫、互相支持的人顯然比那些家庭不和睦、從未找到（或從未尋求）社區歸屬感的人更快樂。婚姻特別重要。多次研究發現，良好的婚姻和高主觀幸福感之間有非常密切的相關性，而糟糕的婚姻與痛苦之間也很密切相關。這一點對經濟甚至身體狀況都適用。一個身陷貧困、但有一位愛心滿滿的配偶、一個溫暖的家庭和一個熱情的社區的貧困病人可能感覺比一個孤獨的億萬富翁還要更好，前提是這名病人的貧困不太嚴重，其疾病也不是一種退化性或疼痛性的疾病。

This raises the possibility that the immense improvement in material conditions over the last two centuries was offset by the collapse of the family and the community. If so, the average person might well be no happier today than in 1800. Even the freedom we value so highly may be working against us. We can choose our spouses, friends and neighbours, but they can choose to leave us. With the individual wielding unprecedented power to decide her own path in life, we find it ever harder to make commitments. We thus live in an increasingly lonely world of unravelling communities and families.

But the most important finding of all is that happiness does not really depend on objective conditions of either wealth, health or even community. Rather, it depends on the correlation between objective conditions and subjective

expectations. If you want a bullock-cart and get a bullock-cart, you are content. If you want a brand-new Ferrari and get only a second-hand Fiat you feel deprived. This is why winning the lottery has, over time, the same impact on people's happiness as a debilitating car accident. When things improve, expectations balloon, and consequently even dramatic improvements in objective conditions can leave us dissatisfied. When things deteriorate, expectations shrink, and consequently even a severe illness might leave you pretty much as happy as you were before.

這引發了一個可能性，即過去兩個世紀物質條件的巨大改善被家庭和社區的崩潰所抵銷。如果是這樣，普通人今天可能不會比1800年更幸福。即使我們非常珍視的自由也可能對我們不利。我們可以選擇配偶、朋友和鄰居，但他們也可以選擇離開我們。隨著個人擁有前所未有的決定自己人生道路的權力，我們發現越來越難做出承諾。因此，我們生活在愈來愈孤獨的社區和家庭瓦解的世界中。但最重要的發現是，幸福的確不取決於財富、健康甚至社區等客觀條件。相反，它取決於客觀條件和主觀期望之間的相關性。如果你想要一輛牛車並得到了一輛牛車，你就會滿足。如果你想要一輛全新的法拉利，但只得到一輛二手菲亞特，你會感到被剝奪了。這就是為什麼中獎在時間的作用下對人們的幸福感產生了同樣的影響，就像一個嚴重的車禍一樣。當事情改善時，期望值會膨脹，因此即使客觀條件有了劇烈的改善，我們仍然會感到不滿意。當事情惡化時，期望值會收縮，因此即使你患上了嚴重的疾病，你可能會和以前一樣開心。

You might say that we didn't need a bunch of psychologists and their questionnaires to discover this. Prophets, poets and philosophers realised thousands of years ago that being satisfied with what you already have is far more important than getting more of what you want. Still, it's nice when modern research – bolstered by lots of numbers and charts – reaches the same conclusions the ancients did.

The crucial importance of human expectations has far-reaching implications for understanding the history of happiness. If happiness depended only on objective conditions such as wealth, health and social relations, it would have been relatively easy to investigate its history. The finding that it depends on subjective expectations makes the task of historians far harder. We moderns have an arsenal of tranquillisers and painkillers at our disposal,

but our expectations of ease and pleasure, and our intolerance of inconvenience and discomfort, have increased to such an extent that we may well suffer from pain more than our ancestors ever did.

我們可以說，我們不需要一堆心理學家和他們的問卷來發現這一點。先知、詩人和哲學家在幾千年前就已經意識到，滿足現有的享有，比追求自己所想更重要。然而，現代研究所得出的結論-用許多數字和圖表支持-與古人相似，這真是太好了。對於了解幸福歷史的重要性，人類期望值至關重要，這對其具有深遠的影響。如果幸福依賴於財富、健康和社會關係等客觀條件，那麼調查其歷史將相對容易。然而，發現它取決於主觀期望使歷史學家的任務更加困難。我們現代人擁有一大堆安定劑和止痛藥，但我們對舒適和享樂的期望、我們對不便和不適的容忍度已經增加到了一個程度，以至於我們可能比我們的祖先更加受苦。

It's hard to accept this line of thinking. The problem is a fallacy of reasoning embedded deep in our psyches. When we try to guess or imagine how happy other people are now, or how people in the past were, we inevitably imagine ourselves in their shoes. But that won't work because it pastes our expectations on to the material conditions of others. In modern affluent societies it is customary to take a shower and change your clothes every day. Medieval peasants went without washing for months on end, and hardly ever changed their clothes. The very thought of living like that, filthy and reeking to the bone, is abhorrent to us. Yet medieval peasants seem not to have minded. They were used to the feel and smell of a long-unlauded shirt. It's not that they wanted a change of clothes but couldn't get it – they had what they wanted. So, at least as far as clothing goes, they were content.

這一種思考方式很難被接受。問題在於這是一種嵌入在我們心理深處的謬誤推理。當我們試圖猜測或想像其他人現在有多幸福，或過去的人們有多幸福時，我們不可避免地想像自己置身其中。但這樣做是行不通的，因為這會把我們自己的期望貼到其他人的物質條件上。在現代富足的社會中，每天洗澡換衣服是一個常規。中世紀的農民長時間不洗澡，幾乎不換衣服。像這樣生活，骯臟到骨子裡，對我們來說是可憎的。然而中世紀的農民似乎無所謂。他們習慣了穿著長時間不洗的衣服和感受到不洗的氣味。並不是他們想換衣服卻做不到——他們已經擁有了他們想要的。因此，至少在衣服方面，他們是滿足的。

That's not so surprising, when you think of it. After all, our chimpanzee cousins seldom wash and never change their clothes. Nor are we disgusted by the fact that our pet dogs and cats don't shower or change their coats daily. We pat, hug and kiss them all the same. Small children in affluent societies often dislike showering, and it takes them years of education and parental discipline to adopt this supposedly attractive custom. It is all a matter of expectations.

If happiness is determined by expectations, then two pillars of our society – mass media and the advertising industry – may unwittingly be depleting the globe's reservoirs of contentment. If you were an eighteen-year-old youth in a small village 5,000 years ago you'd probably think you were good-looking because there were only fifty other men in your village and most of them were either old, scarred and wrinkled, or still little kids. But if you are a teenager today you are a lot more likely to feel inadequate. Even if the other guys at school are an ugly lot, you don't measure yourself against them but against the movie stars, athletes and supermodels you see all day on television, Facebook and giant billboards.

當你考慮這一點時，這並不那麼令人驚訝。畢竟，我們的黑猩猩堂兄很少洗澡，也從不換衣服。我們也不會對我們的寵物狗和貓不每天淋浴或更換外衣感到厭惡。我們一樣地拍打、擁抱和親吻牠們。富裕社會的小孩通常不喜歡淋浴，需要多年的教育和家長的管教才能接受這種被認為是吸引人的習慣。這只是一個期望的問題。如果幸福是由期望決定的，那麼我們社會的兩大支柱——大眾媒體和廣告業——可能會在不知不覺中耗盡全球的幸福之池。如果你是5000年前的一位十八歲的年輕人，你可能會認為自己很好看，因為你村莊裡只有其他五十個男人，他們大多已經老了，有疤痕和皺紋，或者還是小孩。但如果你是今天的一位十幾歲的青少年，你更可能會感到自己不足。即使學校裡的其他男孩長相平凡，你也不是以他們為對象，而是以你每天在電視、Facebook和巨型廣告牌上看到的電影明星、運動員和超模為標準衡量自己。

So maybe Third World discontent is fomented not merely by poverty, disease, corruption and political oppression but also by mere exposure to First World standards. The average Egyptian was far less likely to die from starvation, plague or violence under Hosni Mubarak than under Ramses II or

Cleopatra. Never had the material condition of most Egyptians been so good. You'd think they would have been dancing in the streets in 2011, thanking Allah for their good fortune. Instead they rose up furiously to overthrow Mubarak. They weren't comparing themselves to their ancestors under the pharaohs, but rather to their contemporaries in Obama's America.

If that's the case, even immortality might lead to discontent. Suppose science comes up with cures for all diseases, effective anti-ageing therapies and regenerative treatments that keep people indefinitely young. In all likelihood, the immediate result will be an unprecedented epidemic of anger and anxiety.

也許，第三世界的不滿不僅是因為貧困、疾病、腐敗和政治壓迫，還因為接觸到第一世界的標準。在胡斯尼·穆巴拉克統治時期，埃及平民死於飢餓、瘟疫或暴力的機率遠比在拉美西斯二世或克麗奧帕特拉統治時期要小得多。大多數埃及人的物質條件從未像現在這樣好。你可能會以為他們應該在2011年的街頭舞蹈，感謝阿拉蒂的好運。然而，他們卻憤怒地起義，推翻了穆巴拉克。他們不是在比較自己和法老王時代的祖先，而是在和奧巴馬的美國同代人進行比較。如果是這樣的話，連永生也可能導致不滿。假設科學找到了治愈所有疾病、有效抗衰老療法和使人永葆青春的再生治療方法。很可能，立即的結果將是前所未有的憤怒和焦慮瘟疫。

Those unable to afford the new miracle treatments – the vast majority of people – will be beside themselves with rage. Throughout history, the poor and oppressed comforted themselves with the thought that at least death is even-handed – that the rich and powerful will also die. The poor will not be comfortable with the thought that they have to die, while the rich will remain young and beautiful for ever.



45. In previous eras the standard of beauty was set by the handful of people who lived next door to you. Today the media and the fashion industry expose us to a totally unrealistic standard of beauty. They search out the most gorgeous people on the planet, and then parade them constantly before our eyes. No wonder we are far less happy with the way we look.

不能負擔新奇跡療法的人——也就是大多數人——會憤怒萬分。歷史上，窮人和被壓迫者常常以這樣的想法來安慰自己：至少死亡是公正的，有錢有勢的人也會死。窮人不會接受這樣的想法：他們得死，而富人卻可以永保年輕、美麗。以前，美的標準是身邊幾個鄰居。現在，媒體和時尚產業讓我們接觸到一個完全不現實的美麗標準。他們尋找世界上最美麗的人，讓我們始終目不轉睛。難怪我們不再喜歡自己的外表。

But the tiny minority able to afford the new treatments will not be euphoric either. They will have much to be anxious about. Although the new therapies could extend life and youth, they cannot revive corpses. How dreadful to think that I and my loved ones can live for ever, but only if we don't get hit by a truck or blown to smithereens by a terrorist! Potentially a-mortal people

are likely to grow averse to taking even the slightest risk, and the agony of losing a spouse, child or close friend will be unbearable.

Chemical Happiness

Social scientists distribute subjective well-being questionnaires and correlate the results with socio-economic factors such as wealth and political freedom. Biologists use the same questionnaires, but correlate the answers people give them with biochemical and genetic factors. Their findings are shocking.

但是能夠負擔新療法的極少數人也不會感到愉快。他們會有很多焦慮。雖然新療法可以延長生命和青春，但它們無法使死者復活。想到我和我的親人可以永生不死，但只有在我們不會被卡車撞死或被恐怖分子炸成碎片的情況下，讓人感到可怕！潛在的不死者可能會變得非常厭惡即使是最微小的風險，失去配偶、孩子或好友的痛苦也會變得無法承受。社會科學家發放主觀幸福問卷，並將結果與財富和政治自由等社會經濟因素進行相關。生物學家使用相同的問卷，但將人們所給出的答案與生化和遺傳因素相關聯。他們的發現令人震驚。

Biologists hold that our mental and emotional world is governed by biochemical mechanisms shaped by millions of years of evolution. Like all other mental states, our subjective well-being is not determined by external parameters such as salary, social relations or political rights. Rather, it is determined by a complex system of nerves, neurons, synapses and various biochemical substances such as serotonin, dopamine and oxytocin.

Nobody is ever made happy by winning the lottery, buying a house, getting a promotion or even finding true love. People are made happy by one thing and one thing only – pleasant sensations in their bodies. A person who just won the lottery or found new love and jumps from joy is not really reacting to the money or the lover. She is reacting to various hormones coursing through her bloodstream, and to the storm of electric signals flashing between different parts of her brain.

生物學家认为，我们的心理和情感世界由经过数百万年进化塑造的生化机制所支配。像所有其他心理状态一样，我们的主观幸福感不是由

外部参数如薪水、社交关系或政治权利来决定的。相反，它是由一套复杂的神经、神经元、突触以及各种生化物质如血清素、多巴胺和催产素所决定的。没有人会因中了彩票、买了房子、升职甚至找到真爱而感到幸福。真正让人快乐的是一件事情，那就是在他们的身体中感到愉悦的感觉。刚刚中了彩票或找到新的爱情而欢呼跳跃的人，实际上并不是在对钱或情人做出反应。她是在对不同的荷尔蒙在她的血液中流动以及各种电信号在她的大脑不同部位之间闪烁的风暴做出反应。

Unfortunately for all hopes of creating heaven on earth, our internal biochemical system seems to be programmed to keep happiness levels relatively constant. There's no natural selection for happiness as such – a happy hermit's genetic line will go extinct as the genes of a pair of anxious parents get carried on to the next generation. Happiness and misery play a role in evolution only to the extent that they encourage or discourage survival and reproduction. Perhaps it's not surprising, then, that evolution has moulded us to be neither too miserable nor too happy. It enables us to enjoy a momentary rush of pleasant sensations, but these never last for ever. Sooner or later they subside and give place to unpleasant sensations.

For example, evolution provided pleasant feelings as rewards to males who spread their genes by having sex with fertile females. If sex were not accompanied by such pleasure, few males would bother. At the same time, evolution made sure that these pleasant feelings quickly subsided. If orgasms were to last for ever, the very happy males would die of hunger for lack of interest in food, and would not take the trouble to look for additional fertile females.

很不幸地，我們的內部生化系統似乎被編程成保持幸福水平相對穩定。沒有關於幸福的自然選擇- 一個快樂的隱士的基因線將會滅絕，而焦慮父母的基因將被傳承到下一代。幸福和痛苦在進化中只能起到鼓勵或阻止生存和繁殖的作用。也許這不足為奇- 進化塑造我們既不太不快樂也不太快樂。它使我們享受短暫的愉悅感，但這些感覺從來沒有持續到永遠。遲早它們會消失，讓位於不愉悅的感覺。例如，進化提供了愉悅的感覺，作為獎勵對於通過與肥沃雌性進行性行為而傳遞他們基因的雄性。如果性不伴隨愉悅，很少有雄性會去找麻煩。同時，進化確保這些愉悅感很快就會消失。如果高潮能夠持續到永遠，

非常幸福的雄性會死於飢餓，因為他們缺乏對食物的興趣，就不會去尋找更多的肥沃雌性。

Some scholars compare human biochemistry to an air-conditioning system that keeps the temperature constant, come heatwave or snowstorm. Events might momentarily change the temperature, but the air-conditioning system always returns the temperature to the same set point.

Some air-conditioning systems are set at twenty-five degrees Celsius. Others are set at twenty degrees. Human happiness conditioning systems also differ from person to person. On a scale from one to ten, some people are born with a cheerful biochemical system that allows their mood to swing between levels six and ten, stabilising with time at eight. Such a person is quite happy even if she lives in an alienating big city, loses all her money in a stock-exchange crash and is diagnosed with diabetes. Other people are cursed with a gloomy biochemistry that swings between three and seven and stabilises at five. Such an unhappy person remains depressed even if she enjoys the support of a tight-knit community, wins millions in the lottery and is as healthy as an Olympic athlete. Indeed, even if our gloomy friend wins \$50,000,000 in the morning, discovers the cure for both AIDS and cancer by noon, makes peace between Israelis and Palestinians that afternoon, and then in the evening reunites with her long-lost child who disappeared years ago – she would still be incapable of experiencing anything beyond level seven happiness. Her brain is simply not built for exhilaration, come what may.

有些學者將人體生化過程比作空調系統，不論炎熱或暴風雪，始終維持恆溫。某些事件可能暫時改變溫度，但空調系統總是會將溫度調回同一個設定點。有些空調系統設定在攝氏二十五度，而有些則設定在攝氏二十度。人類快樂調節系統因人而異。在一至十的尺度上，有些人天生具備愉快的生化系統，讓他們的情緒在六和十之間擺動，最後穩定在八。即使這樣的人生活在疏離的大城市，股票市場崩盤失去所有財產，還被診斷患有糖尿病，他仍感到相當快樂。其他人被詛咒著陰沉的生化系統，情緒在三和七之間擺動，最後穩定在五。這樣的不幸者即使擁有緊密的社群支持，贏得千萬彩票，健康如奧運選手，仍然感到沮喪。事實上，即使我們陰沉的朋友早上贏得了五千萬美元，中午發現了對抗艾滋病和癌症的治療方法，下午讓以色列和巴勒斯坦

人和平共處，晚上重聚和失散多年的孩子，她仍然無法體驗到超過七級快樂的感覺。她的大腦就是不能感受到振奮，不管發生什麼事情。

Think for a moment of your family and friends. You know some people who remain relatively joyful, no matter what befalls them. And then there are those who are always disgruntled, no matter what gifts the world lays at their feet. We tend to believe that if we could just change our workplace, get married, finish writing that novel, buy a new car or repay the mortgage, we would be on top of the world. Yet when we get what we desire we don't seem to be any happier. Buying cars and writing novels do not change our biochemistry. They can startle it for a fleeting moment, but it is soon back to its set point.

How can this be squared with the above-mentioned psychological and sociological findings that, for example, married people are happier on average than singles? First, these findings are correlations – the direction of causation may be the opposite of what some researchers have assumed. It is true that married people are happier than singles and divorcees, but that does not necessarily mean that marriage produces happiness. It could be that happiness causes marriage. Or more correctly, that serotonin, dopamine and oxytocin bring about and maintain a marriage. People who are born with a cheerful biochemistry are generally happy and content. Such people are more attractive spouses, and consequently they have a greater chance of getting married. They are also less likely to divorce, because it is far easier to live with a happy and content spouse than with a depressed and dissatisfied one. Consequently, it's true that married people are happier on average than singles, but a single woman prone to gloom because of her biochemistry would not necessarily become happier if she were to hook up with a husband.

想一想你的家人和朋友。你知道一些人，无论发生什么事情，他们总是保持相对愉快。然而，也有那些人总是不满意，无论世界给他们提供什么礼物。我们倾向于相信，如果我们能够改变我们的工作场所，结婚，完成写小说，买新车或偿还抵押贷款，我们将处于世界之巅。然而，当我们得到我们想要的东西时，我们似乎并不更加快乐。买车和写小说并不会改变我们的生化作用。它们可以在短暂的瞬间惊艳它，但很快就会回到它的设定点。这如何与上述心理和社会学发现相

符呢？例如，已婚人士平均比单身者更幸福。首先，这些发现是相互关联的 - 因果关系的方向可能与一些研究人员所假设的相反。确实，已婚人士比单身者和离婚人士更幸福，但这并不一定意味着婚姻会带来幸福。它可能是幸福引起婚姻。或更正确地说，血清素，多巴胺和催产素带来和维持婚姻。具有愉快生化的人通常很快乐和满足。这样的人更有吸引力的配偶，因此他们有更大的机会结婚。他们也不太可能离婚，因为与沮丧和不满足的人生活比与快乐和满足的人生活要容易得多。因此，已婚人士平均比单身者更幸福是真实的，但一个由于生化作用倾向于抑郁的单身女性并不一定会因为与丈夫交往而变得更快乐。

In addition, most biologists are not fanatics. They maintain that happiness is determined *mainly* by biochemistry, but they agree that psychological and sociological factors also have their place. Our mental air-conditioning system has some freedom of movement within predetermined borders. It is almost impossible to exceed the upper and lower emotional boundaries, but marriage and divorce can have an impact in the area between the two. Somebody born with an average of level five happiness would never dance wildly in the streets. But a good marriage should enable her to enjoy level seven from time to time, and to avoid the despondency of level three.

If we accept the biological approach to happiness, then history turns out to be of minor importance, since most historical events have had no impact on our biochemistry. History can change the external stimuli that cause serotonin to be secreted, yet it does not change the resulting serotonin levels, and hence it cannot make people happier.

此外，大多數生物學家並不激進。他們認為，幸福主要是由生化作用所決定，但他們也同意心理和社會因素也有其地位。我們的心理調節系統在預定的邊界內具有一定的自由度。幾乎不可能超過上下情緒邊界，但婚姻和離婚對於兩者之間的領域會產生影響。一個出生時平均幸福水平為五級的人永遠不會在街上狂舞。但一段美好的婚姻應該讓她有時能夠享受到七級的幸福，避免陷入三級的沮喪。如果我們接受幸福的生物學方法，則歷史事實上對於幸福來說並不重要，因為大多數歷史事件對我們的生化作用沒有影響。歷史可以改變引起血清素分泌的外部刺激，但它不會改變血清素的水平，因此它不能讓人們變得更幸福。

Compare a medieval French peasant to a modern Parisian banker. The peasant lived in an unheated mud hut overlooking the local pigsty, while the banker goes home to a splendid penthouse with all the latest technological gadgets and a view to the Champs-Elysées. Intuitively, we would expect the banker to be much happier than the peasant. However, mud huts, penthouses and the Champs-Elysées don't really determine our mood. Serotonin does. When the medieval peasant completed the construction of his mud hut, his brain neurons secreted serotonin, bringing it up to level X. When in 2014 the banker made the last payment on his wonderful penthouse, brain neurons secreted a similar amount of serotonin, bringing it up to a similar level X. It makes no difference to the brain that the penthouse is far more comfortable than the mud hut. The only thing that matters is that at present the level of serotonin is X. Consequently the banker would not be one iota happier than his great-great-great-grandfather, the poor medieval peasant.

將中世紀法國農民和現代巴黎銀行家相比較。農民住在一個沒有供暖的泥屋裡，俯瞰當地的豬舍，而銀行家則回到一個華麗的頂層公寓，擁有最新的技術裝備和查姆斯-埃利塞大街的美景。從直覺上講，我們會期望銀行家比農民更幸福。然而，泥屋、頂層公寓和查姆斯-埃利塞大街並不能真正決定我們心情，而是血清素才是。當中世紀農民完成他的泥屋建造時，他的大腦神經元分泌血清素，將其提高到X級別。當2014年銀行家完成他的頂層公寓的最後付款時，腦神經元分泌了類似量的血清素，將其提高到類似X級別。大腦並不在乎頂層公寓比泥屋更舒適，唯一重要的是當前血清素水平為X。因此，銀行家不會比他的曾曾曾祖父——貧窮的中世紀農民更快樂一絲一毫。

This is true not only of private lives, but also of great collective events. Take, for example, the French Revolution. The revolutionaries were busy: they executed the king, gave lands to the peasants, declared the rights of man, abolished noble privileges and waged war against the whole of Europe. Yet none of that changed French biochemistry. Consequently, despite all the political, social, ideological and economic upheavals brought about by the revolution, its impact on French happiness was small. Those who won a cheerful biochemistry in the genetic lottery were just as happy before the revolution as after. Those with a gloomy biochemistry complained about Robespierre and Napoleon with the same bitterness with which they earlier complained about Louis XVI and Marie Antoinette.

這不僅適用於私人生活，也適用於重大的集體事件。舉個例子，法國大革命。革命者忙著：處決國王，將土地賜給農民，宣告人權，廢除貴族特權，並對整個歐洲發動戰爭。然而，這一切並沒有改變法國的生物化學。因此，儘管革命帶來的政治、社會、意識形態和經濟動盪，其對法國幸福的影響很小。那些在基因樂透中贏得愉快生物化學的人，在革命前後都一樣快樂。那些悲觀的人對羅伯斯庇爾和拿破崙的抱怨，和對路易十六和瑪麗·安東尼的抱怨一樣憤怒。

If so, what good was the French Revolution? If people did not become any happier, then what was the point of all that chaos, fear, blood and war? Biologists would never have stormed the Bastille. People think that this political revolution or that social reform will make them happy, but their biochemistry tricks them time and again.

There is only one historical development that has real significance. Today, when we finally realise that the keys to happiness are in the hands of our biochemical system, we can stop wasting our time on politics and social reforms, putsches and ideologies, and focus instead on the only thing that can make us truly happy: manipulating our biochemistry. If we invest billions in understanding our brain chemistry and developing appropriate treatments, we can make people far happier than ever before, without any need of revolutions. Prozac, for example, does not change regimes, but by raising serotonin levels it lifts people out of their depression.

如果是這樣，那麼法國大革命有什麼好處呢？如果人們並沒有變得更加快樂，那麼所有的混亂、恐懼、血腥和戰爭又有什麼意義呢？生物學家永遠不會攻佔巴士底獄。人們認為這場政治革命或那場社會改革會使他們快樂，但他們的生物化學騙了他們一次又一次。只有一個歷史發展具有真正的意義。今天，當我們最終意識到幸福的關鍵在於我們的生物化學系統中時，我們可以停止在政治和社會改革、政變和意識形態上浪費時間，轉而專注於唯一能夠使我們真正快樂的事情：操縱我們的生物化學。如果我們投資數十億美元了解我們的大腦化學和開發合適的治療方法，我們可以讓人們比以往任何時候都更快樂，而無需進行任何革命。例如，Prozac並不改變政權，但通過提高血清素水平，它使人們擺脫了抑鬱症。

Nothing captures the biological argument better than the famous New Age slogan: 'Happiness Begins Within.' Money, social status, plastic surgery, beautiful houses, powerful positions – none of these will bring you happiness. Lasting happiness comes only from serotonin, dopamine and oxytocin.¹

In Aldous Huxley's dystopian novel *Brave New World*, published in 1932 at the height of the Great Depression, happiness is the supreme value and psychiatric drugs replace the police and the ballot as the foundation of politics. Each day, each person takes a dose of 'soma', a synthetic drug which makes people happy without harming their productivity and efficiency. The World State that governs the entire globe is never threatened by wars, revolutions, strikes or demonstrations, because all people are supremely content with their current conditions, whatever they may be. Huxley's vision of the future is far more troubling than George Orwell's *Nineteen Eighty-Four*. Huxley's world seems monstrous to most readers, but it is hard to explain why. Everybody is happy all the time – what could be wrong with that?

沒有什麼比著名的新時代口號「幸福從內心開始」更能體現生物學論點。金錢、社會地位、整形手術、美麗的房屋和權力地位——這些都不能帶給你幸福。持久的幸福只能來自於血清素、多巴胺和催產素。在奧爾德斯·赫胥黎的反烏托邦小說《美麗新世界》中，幸福是至高無上的價值，精神藥物取代了警察和選舉成為政治的基礎。每天，每個人都服用一劑名為「索瑪」的合成藥物，這種藥物可以讓人在不損害生產力和效率的情況下快樂。統治全球的世界政權永遠不會受到戰爭、革命、罷工或示威的威脅，因為所有的人都對自己當前的處境非常滿意。赫胥黎對未來的遠見比喬治·奧威爾的《一九八四》更加令人不安。赫胥黎的世界對大多數讀者來說都是駭人聽聞的，但很難解釋為什麼。每個人都一直很快樂——這有什麼錯呢？

The Meaning of Life

Huxley's disconcerting world is based on the biological assumption that happiness equals pleasure. To be happy is no more and no less than experiencing pleasant bodily sensations. Since our biochemistry limits the

volume and duration of these sensations, the only way to make people experience a high level of happiness over an extended period of time is to manipulate their biochemical system.

But that definition of happiness is contested by some scholars. In a famous study, Daniel Kahneman, winner of the Nobel Prize in economics, asked people to recount a typical work day, going through it episode by episode and evaluating how much they enjoyed or disliked each moment. He discovered what seems to be a paradox in most people's view of their lives. Take the work involved in raising a child. Kahneman found that when counting moments of joy and moments of drudgery, bringing up a child turns out to be a rather unpleasant affair. It consists largely of changing nappies, washing dishes and dealing with temper tantrums, which nobody likes to do. Yet most parents declare that their children are their chief source of happiness. Does it mean that people don't really know what's good for them?

赫胥黎引人注目的世界觀基於生物學的假設，即快樂等於愉悅感。要感到快樂就是體驗到愉悅的生理感覺。由於我們的生化作用限制了這些感覺的量和持續時間，使人在長時間內體驗到高度的快樂的唯一方法就是操縱他們的生化系統。但這個幸福的定義在一些學者中受到了質疑。在一項著名的研究中，諾貝爾經濟學獎得主丹尼爾·卡尼曼要求人們重述一個典型的工作日，逐個評估他們喜愛或不喜愛每一刻的經歷。他發現大多數人生活觀念中似乎存在矛盾。以撫養孩子為例。卡尼曼發現，在計算快樂和苦差事的時候，撫養孩子是相當不愉快的事情。它主要包括換尿布、洗碗碟和應對脾氣暴躁的孩子，沒有人喜歡做這些。然而，大多數父母都聲稱他們的孩子是他們快樂的主要來源。這是否意味著人們不知道自己究竟想要什麼？

That's one option. Another is that the findings demonstrate that happiness is not the surplus of pleasant over unpleasant moments. Rather, happiness consists in seeing one's life in its entirety as meaningful and worthwhile. There is an important cognitive and ethical component to happiness. Our values make all the difference to whether we see ourselves as 'miserable slaves to a baby dictator' or as 'lovingly nurturing a new life'. ² As Nietzsche put it, if you have a why to live, you can bear almost any how. A meaningful life can be extremely satisfying even in the midst of hardship,

whereas a meaningless life is a terrible ordeal no matter how comfortable it is.

Though people in all cultures and eras have felt the same type of pleasures and pains, the meaning they have ascribed to their experiences has probably varied widely. If so, the history of happiness might have been far more turbulent than biologists imagine. It's a conclusion that does not necessarily favour modernity. Assessing life minute by minute, medieval people certainly had it rough. However, if they believed the promise of everlasting bliss in the afterlife, they may well have viewed their lives as far more meaningful and worthwhile than modern secular people, who in the long term can expect nothing but complete and meaningless oblivion. Asked 'Are you satisfied with your life as a whole?', people in the Middle Ages might have scored quite highly in a subjective well-being questionnaire.

這是其中一個選擇。另一個是這些研究發現表明，幸福不是指歡樂時刻多於痛苦時刻。相反，幸福感在於視生命為一個整體並且富有意義和價值。幸福有一個重要的認知和道德組成部分。我們的價值觀決定了我們是否視自己為“悲慘的奴隸”或“充滿愛心的育兒者”。尼采說過，如果你有一個為什麼而活的理由，你就能承受幾乎任何困難。即使在最艱難的時期，一個有意義的生命也可以非常滿足，而沒有意義的生命則是無論多舒適都是可怕的磨難。雖然各個文化和時代的人都感受到相同的愉悅和痛苦，但他們對他們的經歷所賦予的意義可能差別很大。如果是這樣的話，幸福的歷史可能比生物學家想像的要動盪得多。這個結論並不一定支持現代性。如果以每分每秒評估生命，中世紀的人顯然很苦。但是，如果他們相信來世的永恆幸福的承諾，他們可能會比現代世俗人士更視生命為有意義和有價值，他們在主觀幸福問卷中的得分可能會很高。問及“您對整體生活感到滿意嗎？”中世紀人也可能得到很高的滿意度。

So our medieval ancestors were happy because they found meaning to life in collective delusions about the afterlife? Yes. As long as nobody punctured their fantasies, why shouldn't they? As far as we can tell, from a purely scientific viewpoint, human life has absolutely no meaning. Humans are the outcome of blind evolutionary processes that operate without goal or purpose. Our actions are not part of some divine cosmic plan, and if planet Earth were to blow up tomorrow morning, the universe would probably keep

going about its business as usual. As far as we can tell at this point, human subjectivity would not be missed. Hence *any* meaning that people ascribe to their lives is just a delusion. The other-worldly meanings medieval people found in their lives were no more deluded than the modern humanist, nationalist and capitalist meanings modern people find. The scientist who says her life is meaningful because she increases the store of human knowledge, the soldier who declares that his life is meaningful because he fights to defend his homeland, and the entrepreneur who finds meaning in building a new company are no less delusional than their medieval counterparts who found meaning in reading scriptures, going on a crusade or building a new cathedral.

我們中世紀的祖先很快樂是因為他們在對於來世的共同妄想中找到了生命意義？是的。只要沒有人刺破他們的幻想，他們為何不開心呢？從純粹的科學觀點來看，人類的生命絕對沒有任何意義。人類是盲目演化過程的結果，沒有目標或目的。我們的行為不是某種神聖的宇宙計劃的一部分，如果地球明天早上爆炸，宇宙可能仍然像往常一樣繼續運轉。在我們目前看來，人類主觀性不會被錯過。因此，人們賦予他們生命的任何意義都只是一種妄想。中世紀人發現的超凡意義與現代人文主義、民族主義和資本主義意義一樣虛幻。說自己的生命因為增加人類知識儲備而有意義的科學家、宣稱自己的生命因為捍衛祖國而有意義的士兵，以及在建立新公司中找到意義的企業家和他們的中世紀同行讀經、去東征或建造新的大教堂的意義一樣虛幻。

So perhaps happiness is synchronising one's personal delusions of meaning with the prevailing collective delusions. As long as my personal narrative is in line with the narratives of the people around me, I can convince myself that my life is meaningful, and find happiness in that conviction.

This is quite a depressing conclusion. Does happiness really depend on self-delusion?

Know Thyself

If happiness is based on feeling pleasant sensations, then in order to be happier we need to re-engineer our biochemical system. If happiness is

based on feeling that life is meaningful, then in order to be happier we need to delude ourselves more effectively. Is there a third alternative?

Both the above views share the assumption that happiness is some sort of subjective feeling (of either pleasure or meaning), and that in order to judge people's happiness, all we need to do is ask them how they feel. To many of us, that seems logical because the dominant religion of our age is liberalism. Liberalism sanctifies the subjective feelings of individuals. It views these feelings as the supreme source of authority. What is good and what is bad, what is beautiful and what is ugly, what ought to be and what ought not to be, are all determined by what each one of us feels.

也許幸福就是將個人的偏見意義與流行的集體妄想同步。只要我的個人敘事與身邊人的故事保持一致，我就能說服自己生命有意義，從而找到幸福感。這是相當令人沮喪的結論。幸福真的取決於自我欺騙嗎？如果幸福基於感受愉悅的感覺，那麼為了更快樂，我們需要重新調整我們的生化系統。如果幸福基於感受人生有意義，那麼為了更快樂，我們需要更有效地欺騙自己。有第三種選擇嗎？上述觀點都假設幸福是某種主觀感覺（愉悅或意義），而為了判斷人們的幸福感，我們只需要問他們感覺如何。對許多人來說，這似乎很合理，因為我們時代的主要宗教是自由主義。自由主義神聖化個人的主觀感受。它將這些感受視為最高的權威來源。什麼是好的，什麼不好，什麼是美的，什麼是醜的，什麼應該是什麼不應該是，都是由每個人的感受決定的。

Liberal politics is based on the idea that the voters know best, and there is no need for Big Brother to tell us what is good for us. Liberal economics is based on the idea that the customer is always right. Liberal art declares that beauty is in the eye of the beholder. Students in liberal schools and universities are taught to think for themselves. Commercials urge us to 'Just do it!' Action films, stage dramas, soap operas, novels and catchy pop songs indoctrinate us constantly: 'Be true to yourself', 'Listen to yourself', 'Follow your heart'. Jean-Jacques Rousseau stated this view most classically: 'What I feel to be good – is good. What I feel to be bad – is bad.'

People who have been raised from infancy on a diet of such slogans are prone to believe that happiness is a subjective feeling and that each

individual best knows whether she is happy or miserable. Yet this view is unique to liberalism. Most religions and ideologies throughout history stated that there are objective yardsticks for goodness and beauty, and for how things ought to be. They were suspicious of the feelings and preferences of the ordinary person. At the entrance of the temple of Apollo at Delphi, pilgrims were greeted by the inscription: ‘Know thyself!’ The implication was that the average person is ignorant of his true self, and is therefore likely to be ignorant of true happiness. Freud would probably concur. ^{*}

自由主義政治是基於選民最了解自己，並且沒必要讓“老大哥”告訴我們什麼對我們最好。自由主義經濟是基於顧客永遠是對的這個想法。自由主義的藝術宣稱美在觀察者的眼中。自由派的學校和大學的學生被教導學會為自己思考。廣告敦促我們“只需去做！”。動作片，舞台劇，肥皂劇，小說和流行歌曲不斷洗腦我們：“忠於自己”，“聆聽自己”，“跟隨自己的心”。讓·雅克·盧梭最經典地表達了這種觀點：“我認為好的 - 就是好的。我認為不好的 - 就是不好的。”從嬰兒時期就接受這些口號培養出來的人，容易相信快樂是主觀感受，每個人都最了解自己是否快樂或痛苦。然而，這種觀點只是自由主義者的獨特觀念。歷史上大部分宗教和意識形態都聲稱，美好和良善是有客觀標準，要如何做事亦應如此。他們對普通人的感受和偏好持懷疑態度。在德爾斐阿波羅神廟的入口處，朝聖者會看到“認識自己！”的銘文。暗示平凡人對自己真正的自我一無所知，因此可能對真正的快樂也一無所知。弗洛伊德可能會同意這種說法。

And so would Christian theologians. St Paul and St Augustine knew perfectly well that if you asked people about it, most of them would prefer to have sex than pray to God. Does that prove that having sex is the key to happiness? Not according to Paul and Augustine. It proves only that humankind is sinful by nature, and that people are easily seduced by Satan. From a Christian viewpoint, the vast majority of people are in more or less the same situation as heroin addicts. Imagine that a psychologist embarks on a study of happiness among drug users. He polls them and finds that they declare, every single one of them, that they are only happy when they shoot up. Would the psychologist publish a paper declaring that heroin is the key to happiness?

The idea that feelings are not to be trusted is not restricted to Christianity. At least when it comes to the value of feelings, even Darwin and Dawkins might

find common ground with St Paul and St Augustine. According to the selfish gene theory, natural selection makes people, like other organisms, choose what is good for the reproduction of their genes, even if it is bad for them as individuals. Most males spend their lives toiling, worrying, competing and fighting, instead of enjoying peaceful bliss, because their DNA manipulates them for its own selfish aims. Like Satan, DNA uses fleeting pleasures to tempt people and place them in its power.

基督教神學家亦同意這一點。聖保羅和聖奧古斯丁非常清楚，如果你問人們，他們大多數都更愿意性交而非向上帝祈禱。這證明了性交是幸福的關鍵嗎？根據保羅和奧古斯丁的觀點並不是，這只是證明人性自然而然地犯罪，人們容易被撒但所誘惑。從基督教的角度來看，絕大多數的人都和毒品上癮者處于相似的情況。假如一位心理學家開始研究毒品用戶的幸福感。他詢問他們，並發現每個毒品用戶都聲稱只有注射毒品時才感到快樂。那這位心理學家會發表論文聲稱毒品是幸福的關鍵嗎？感覺不可信是一個普遍存在的觀念，這並不限于基督教。至少在感覺的價值方面，達爾文和道金斯甚至可能與聖保羅和聖奧古斯丁有共同點。根据自私的基因理论，自然选择使人们像其他生物一样选择对他们基因复制有利的事物，即使这对个人有害也如此。大多数男性的一生都在辛勤劳动、担忧、竞争和战斗中度过，而不是享受平静的幸福，因为他们的 DNA 操纵他们来实现自己的自私目的。与撒旦一样，DNA 用短暂的愉悦来诱惑人们并使他们屈服于自己的掌控。

Most religions and philosophies have consequently taken a very different approach to happiness than liberalism does.³ The Buddhist position is particularly interesting. Buddhism has assigned the question of happiness more importance than perhaps any other human creed. For 2,500 years, Buddhists have systematically studied the essence and causes of happiness, which is why there is a growing interest among the scientific community both in their philosophy and their meditation practices.

Buddhism shares the basic insight of the biological approach to happiness, namely that happiness results from processes occurring within one's body, and not from events in the outside world. However, starting from the same insight, Buddhism reaches very different conclusions.

According to Buddhism, most people identify happiness with pleasant feelings, while identifying suffering with unpleasant feelings. People consequently ascribe immense importance to what they feel, craving to experience more and more pleasures, while avoiding pain. Whatever we do throughout our lives, whether scratching our leg, fidgeting slightly in the chair, or fighting world wars, we are just trying to get pleasant feelings.

大多數宗教和哲學對於快樂的方式與自由主義截然不同。其中佛教的觀點尤其有趣。佛教賦予快樂這個問題的重要性可能超過其他任何人類性的信仰。2500年以來，佛教從系統的角度研究快樂的本質和原因，因此科學界對他們的哲學和冥想練習越來越感興趣。佛教與生物學的快樂方法分享了基本的洞察力，即快樂來自於發生在身體內部的過程，而不是來自於外部世界的事。但是，從相同的觀點開始，佛教得出的結論完全不同。根據佛教的教義，大多數人認為快樂是愉快的感覺，而將痛苦與不愉快的感覺相混為一談。因此，人們賦予他們的感受極大的重要性，渴望經歷更多愉悅，同時避免痛苦。無論我們在生命中做些什麼，無論是搔抓腿，輕微的在椅子上晃動，還是打世界大戰，我們只是想獲得愉快的感覺。

The problem, according to Buddhism, is that our feelings are no more than fleeting vibrations, changing every moment, like the ocean waves. If five minutes ago I felt joyful and purposeful, now these feelings are gone, and I might well feel sad and dejected. So if I want to experience pleasant feelings, I have to constantly chase them, while driving away the unpleasant feelings. Even if I succeed, I immediately have to start all over again, without ever getting any lasting reward for my troubles.

What is so important about obtaining such ephemeral prizes? Why struggle so hard to achieve something that disappears almost as soon as it arises? According to Buddhism, the root of suffering is neither the feeling of pain nor of sadness nor even of meaninglessness. Rather, the real root of suffering is this never-ending and pointless pursuit of ephemeral feelings, which causes us to be in a constant state of tension, restlessness and dissatisfaction. Due to this pursuit, the mind is never satisfied. Even when experiencing pleasure, it is not content, because it fears this feeling might soon disappear, and craves that this feeling should stay and intensify.

問題在於佛教認為，我們的感受只是短暫的震動，每刻都在改變，就像海浪一樣。如果五分鐘前我感到快樂和有目標，現在這些感受已經消失了，我可能會感到悲傷和失望。所以，如果我想體驗愉悅的感覺，就必須不斷追求它們，並驅散不愉快的感覺。即使我成功了，我也必須立即重新開始，從未因我的努力而獲得任何持久的回報。為什麼獲得如此短暫的獎賞如此重要？為什麼要如此努力地爭取幾乎一出現就消失的東西？根據佛教，痛苦的根源既不是疼痛、悲傷，也不是沒有意義。真正的痛苦根源在於這種永無止境、毫無意義的追求短暫感受，這使我們處於不斷緊張、不安和不滿的狀態。由於這種追求，心靈永遠不會滿足。即使在體驗快樂時，心靈也不會滿足，因為它擔心這種感覺可能很快消失，並渴望這種感覺能夠保持和加強。

People are liberated from suffering not when they experience this or that fleeting pleasure, but rather when they understand the impermanent nature of all their feelings, and stop craving them. This is the aim of Buddhist meditation practices. In meditation, you are supposed to closely observe your mind and body, witness the ceaseless arising and passing of all your feelings, and realise how pointless it is to pursue them. When the pursuit stops, the mind becomes very relaxed, clear and satisfied. All kinds of feelings go on arising and passing – joy, anger, boredom, lust – but once you stop craving particular feelings, you can just accept them for what they are. You live in the present moment instead of fantasising about what might have been.

The resulting serenity is so profound that those who spend their lives in the frenzied pursuit of pleasant feelings can hardly imagine it. It is like a man standing for decades on the seashore, embracing certain ‘good’ waves and trying to prevent them from disintegrating, while simultaneously pushing back ‘bad’ waves to prevent them from getting near him. Day in, day out, the man stands on the beach, driving himself crazy with this fruitless exercise. Eventually, he sits down on the sand and just allows the waves to come and go as they please. How peaceful!

人們不是在經歷這種或那種短暫的快樂時才從痛苦中解脫，而是當了解所有情感的無常性並停止渴望時。這是佛教冥想練習的目的。在冥想中，你應該密切觀察你的心靈和身體，見證所有情感的不斷興起和消逝，並意識到追求它們是多麼毫無意義。當追求停止時，心靈變得非常放鬆、清晰和滿足。各種情感會繼續興起和消逝——喜悅、憤

怒、無聊、欲望——但一旦你停止渴望特定的情感，你只需接受它們本質上的樣子。你活在當下，而不是空想可能發生的事情。由此產生的平靜是如此深刻，以至於那些一生都在瘋狂追求愉快情感的人幾乎無法想象。這就像一個人在海岸邊站了幾十年，擁抱某些“好”的浪潮並試圖防止它們瓦解，同時向後推“壞”的浪潮以防它們靠近他。那人日復一日地站在海灘上，讓自己為這種徒勞無功的運動發狂。最終，他坐在沙灘上，任由海浪自由地來來去去。多麼平靜！

This idea is so alien to modern liberal culture that when Western New Age movements encountered Buddhist insights, they translated them into liberal terms, thereby turning them on their head. New Age cults frequently argue: ‘Happiness does not depend on external conditions. It depends only on what we feel inside. People should stop pursuing external achievements such as wealth and status, and connect instead with their inner feelings.’ Or more succinctly, ‘Happiness Begins Within.’ This is exactly what biologists argue, but more or less the opposite of what Buddha said.

Buddha agreed with modern biology and New Age movements that happiness is independent of external conditions. Yet his more important and far more profound insight was that true happiness is also independent of our inner feelings. Indeed, the more significance we give our feelings, the more we crave them, and the more we suffer. Buddha’s recommendation was to stop not only the pursuit of external achievements, but also the pursuit of inner feelings.

這個觀念對現代自由文化來說非常陌生，以至於當西方新時代運動遇到佛教的智慧時，他們也把它們轉化成自由主義的詞彙，從而把本意翻轉了。新時代邪教經常主張：“幸福不取決於外部條件，而只取決於我們內心的感覺。人們應該停止追求外部成就，如財富和地位，而是與內在感覺建立聯繫。”或者更簡潔地說，“幸福始於內心。”這正是生物學家所主張的，但幾乎與佛家截然相反。佛陀同意現代生物學和新時代運動的觀點，即幸福與外部條件無關，但他更重要、更深遠的洞見是：真正的幸福也與我們的內在感覺無關。事實上，我們越重視自己的感覺，就越渴望它們，並且越受苦。佛陀的建議不僅是停止追求外部成就，也是停止追求內在感覺。

To sum up, subjective well-being questionnaires identify our well-being with our subjective feelings, and identify the pursuit of happiness with the pursuit of particular emotional states. In contrast, for many traditional philosophies and religions, such as Buddhism, the key to happiness is to know the truth about yourself – to understand who, or what, you really are. Most people wrongly identify themselves with their feelings, thoughts, likes and dislikes. When they feel anger, they think, ‘I am angry. This is my anger.’ They consequently spend their life avoiding some kinds of feelings and pursuing others. They never realise that they are not their feelings, and that the relentless pursuit of particular feelings just traps them in misery.

If this is so, then our entire understanding of the history of happiness might be misguided. Maybe it isn't so important whether people's expectations are fulfilled and whether they enjoy pleasant feelings. The main question is whether people know the truth about themselves. What evidence do we have that people today understand this truth any better than ancient foragers or medieval peasants?

總之，主觀幸福問卷將我們的幸福認定為主觀情感，將追求幸福定義為追求特定情感狀態。相反，對於許多傳統哲學和宗教，如佛教，幸福的關鍵是認識自己的真相 - 理解你究竟是誰或什麼。大多數人錯誤地認為自己就是他們的情緒、思想、喜好和厭惡。當他們感到憤怒時，他們會認為：“我很生氣。這是我的憤怒。”因此，他們一輩子都在避免某些情感和追求其他情感。他們從未意識到他們不是他們的情感，而特定情感的不懈追求只會讓他們困在痛苦之中。如果是這樣，那麼我們對幸福歷史的整個理解可能是錯誤的。也許人們的期望是否得到滿足以及是否享受愉快的情感並不是那麼重要。主要問題是人們是否了解自己的真相。我們有什麼證據表明當今人們比古代狩獵者或中世紀農民更了解這個真相嗎？

Scholars began to study the history of happiness only a few years ago, and we are still formulating initial hypotheses and searching for appropriate research methods. It's much too early to adopt rigid conclusions and end a debate that's hardly yet begun. What is important is to get to know as many different approaches as possible and to ask the right questions.

Most history books focus on the ideas of great thinkers, the bravery of warriors, the charity of saints and the creativity of artists. They have much to tell about the weaving and unravelling of social structures, about the rise and fall of empires, about the discovery and spread of technologies. Yet they say nothing about how all this influenced the happiness and suffering of individuals. This is the biggest lacuna in our understanding of history. We had better start filling it.

學者們只是在幾年前開始研究幸福的歷史，我們仍在制定初始假設和尋找適當的研究方法。現在採取嚴格的結論並結束一個幾乎還沒有開始的辯論太早了。重要的是要盡可能了解不同的方法，並提出正確的問題。大多數歷史書籍關注偉大思想家的想法，勇士的勇氣，聖人的慈善和藝術家的創造力。它們對社會結構的編織和解開，帝國的興衰，技術的發現和傳播等方面有很多故事。然而，它們沒有說明所有這些如何影響個人的幸福和痛苦。這是我們對歷史理解最大的空白。我們最好開始填補它。

* Paradoxically, while psychological studies of subjective well-being rely on people's ability to diagnose their happiness correctly, the basic *raison d'être* of psychotherapy is that people don't really know themselves and that they sometimes need professional help to free themselves of self-destructive behaviours.

矛盾的是，心理學對主觀幸福感的研究依賴於人們正確診斷自己的幸福能力，而心理治療的基本理由是人們不真正知道自己，有時需要專業幫助才能擺脫自毀行為。

The End of *Homo Sapiens*

THIS BOOK BEGAN BY PRESENTING HISTORY as the next stage in the continuum of physics to chemistry to biology. Sapiens are subject to the same physical forces, chemical reactions and natural-selection processes that govern all living beings. Natural selection may have provided *Homo sapiens* with a much larger playing field than it has given to any other organism, but the field has still had its boundaries. The implication has been that, no matter what their efforts and achievements, Sapiens are incapable of breaking free of their biologically determined limits.

But at the dawn of the twenty-first century, this is no longer true: *Homo sapiens* is transcending those limits. It is now beginning to break the laws of natural selection, replacing them with the laws of intelligent design.

這本書開始時，把歷史呈現為物理學、化學和生物學的連續體中的下一個階段。智人受到相同的物理力量、化學反應和自然選擇過程的支配，這些支配所有的生物。自然選擇可能為智人提供了比其他生物更大的舞台，但這個領域仍然有著其邊界。這意味著，無論他們做出多少努力和取得多少成就，智人都無法擺脫其生物限制。但在二十一世紀的黎明，這個說法不再成立：智人正在超越這些限制。現在，他們開始打破自然選擇的法則，將其替換為智慧設計的法則。

For close to 4 billion years, every single organism on the planet evolved subject to natural selection. Not even one was designed by an intelligent creator. The giraffe, for example, got its long neck thanks to competition between archaic giraffes rather than to the whims of a super-intelligent being. Proto-giraffes who had longer necks had access to more food and consequently produced more offspring than did those with shorter necks. Nobody, certainly not the giraffes, said, ‘A long neck would enable giraffes to munch leaves off the treetops. Let’s extend it.’ The beauty of Darwin’s

theory is that it does not need to assume an intelligent designer to explain how giraffes ended up with long necks.

For billions of years, intelligent design was not even an option, because there was no intelligence which could design things. Microorganisms, which until quite recently were the only living things around, are capable of amazing feats. A microorganism belonging to one species can incorporate genetic codes from a completely different species into its cell and thereby gain new capabilities, such as resistance to antibiotics. Yet, as best we know, microorganisms have no consciousness, no aims in life, and no ability to plan ahead.

在接近 40 億年的時間裡，地球上的每個生物都是根據自然選擇進化而來。甚至沒有一種生物是由智慧創造者設計的。例如，長頸鹿之所以擁有長脖子，是因為原始長頸鹿之間的競爭，而不是因為超級智慧存在的幻想。具有較長脖子的原始長頸鹿比較短頸鹿可以獲得更多的食物，因此生產的後代也比較多。沒有人，當然也不是長頸鹿，說過：

「長頸能使長頸鹿輕鬆地從樹頂上啃下樹葉。讓我們把頸部加長吧！」達爾文的理論之美在於，它不需要假設一個智慧設計者來解釋長頸鹿如何擁有長頸。在數十億年的時間裡，智慧設計甚至都不是一個選擇，因為當時還沒有能夠設計事物的智慧存在。微生物，直到最近仍然是唯一存在的生物，能夠實現令人驚嘆的壯舉。屬於一個物種的微生物可以將完全不同物種的遺傳碼納入自己的細胞中，從而獲得新的能力，例如對抗抗生素的能力。但是，據我們所知，微生物沒有意識，沒有人生目標，也沒有能力提前計劃。

At some stage organisms such as giraffes, dolphins, chimpanzees and Neanderthals evolved consciousness and the ability to plan ahead. But even if a Neanderthal fantasised about fowls so fat and slow-moving that he could just scoop them up whenever he was hungry, he had no way of turning that fantasy into reality. He had to hunt the birds that had been naturally selected.

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.

在某個階段，像長頸鹿、海豚、黑猩猩和尼安德特人這樣的生物進化出了意識和規劃未來的能力。但即使尼安德特人幻想著吃著肥胖緩慢的禽類，他能隨時抓起它們，但他沒有辦法把這個幻想變成現實。他必須狩獵那些被自然選擇的鳥類。舊制度的第一個裂痕出現在約10000年前的農業革命期間。梦想食用肥肥的、緩慢的雞的智人們发现，如果配種最胖的母鸡和最緩慢的公鸡，它们的一些后代将既肥胖又緩慢。如果將這些後代進行交配，就能生產出一系列肥胖和緩慢的鳥隻。這是一種在自然界中未知的雞的品種，由人智能設計而非神經。

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 *voilà* ! One green fluorescent rabbit for *le monsieur* . Kac named the rabbit Alba.

然而，相較於全能的神明，智人的設計技巧仍有限制。智人能利用選擇性繁殖，繞過和加速平常影響著雞隻的自然選擇過程，但他們無法向野生雞的基因庫中引進全新的特性。從某個角度來看，智人和雞的關係類似於許多生態共生關係的產物，這些關係在自然界中非常普遍。智人對雞施加了奇特的選擇性壓力，使得肥胖和緩慢的雞隻繁衍生息，就像授粉的蜜蜂選擇花朵，使得亮麗色彩的花朵大量繁殖。如今，歷時40億年的自然選擇體系正在面臨一個全然不同的挑戰。在世界各地的實驗室中，科學家正在操縱生物。他們肆無忌憚地打破自然選擇的法則，甚至不受生物原有特性的限制。巴西生物藝術家愛德華多·卡克（Eduardo Kac）在2000年決定創作一件新的藝術品：一隻螢光綠色的兔子。卡克聯繫了一個法國實驗室，支付費用按照他的要求培育了一隻輻照兔。這些法國科學家從一個普通的白色兔胚胎中提取了一個綠色螢光澄海蛋白基因，進行植入，然後就煥然一新，誕生了一隻綠色螢光的兔子。卡克把這隻兔子命名為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 life on earth. After 4 billion years of natural selection, Alba stands at the dawn of a new cosmic era, in which life will be ruled by intelligent design. If this happens, the whole of human history up to that point might, with hindsight, be reinterpreted as a process of experimentation and apprenticeship that revolutionised the game of life. Such a process should be understood from a cosmic perspective of billions of years, rather than from a human perspective of millennia.

不可能通過自然選擇的法則來解釋Alba的存在。她是智能設計的產物。她也預示著未來的事情。如果潛在的Alba所代表的被完全實現-而且如果人類在此期間不滅亡-科學革命可能會證明自己遠遠超越了一個純粹的歷史性革命。它可能會成為自生命出現以來最重要的生物革命。在經過40億年的自然選擇之後，Alba站在一個新的宇宙時代的曙光下，生命將由智能設計主宰。如果發生這種情況，人類歷史上到那時為止的整個過程，可能會被反思為一個革命過程的實驗和學徒期，

革命了生命的遊戲。這樣的過程應該從數十億年的宇宙角度來理解，而不是從幾千年的人類角度來理解。

Biologists the world over are locked in battle with the intelligent-design movement, which opposes the teaching of Darwinian evolution in schools and claims that biological complexity proves there must be a creator who thought out all biological details in advance. The biologists are right about the past, but the proponents of intelligent design might, ironically, be right about the future.

At the time of writing, the replacement of natural selection by intelligent design could happen in any of three ways: through biological engineering, cyborg engineering (cyborgs are beings that combine organic with non-organic parts) or the engineering of inorganic life.

Of Mice and Men

Biological engineering is deliberate human intervention on the biological level (e.g. implanting a gene) aimed at modifying an organism's shape, capabilities, needs or desires, in order to realize some preconceived cultural idea, such as the artistic predilections of Eduardo Kac.

全球的生物學家正在與智能設計運動進行抗爭，後者反對在學校教授達爾文的進化學說，並聲稱生物複雜性證明了必須有構思所有生物細節的創造者存在。生物學家在過去方面是對的，但智能設計的支持者在未來方面可能會是正確的，諷刺的是。筆者撰寫本文時，自然選擇被智能設計所取代的方法可以通過三種方式中的任何一種來實現：通過生物工程、半機器人工程（半機器人是將有機和非有機部分結合的生命體）或是無機生命工程。生物工程是人為地干預生物層面（例如植入基因），旨在修改生物的形狀，能力，需求或渴望，以實現某些預先設想的文化觀念，例如Eduardo Kac的藝術嗜好。

There is nothing new about biological engineering, per se. People have been using it for millennia in order to reshape themselves and other organisms. A simple example is castration. Humans have been castrating bulls for perhaps 10,000 years in order to create oxen. Oxen are less aggressive, and are thus easier to train to pull ploughs. Humans also castrated their own young males

to create soprano singers with enchanting voices and eunuchs who could safely be entrusted with overseeing the sultans harem.

But recent advances in our understanding of how organisms work, down to the cellular and nuclear levels, have opened up previously unimaginable possibilities. For instance, we can today not merely castrate a man, but also change his sex through surgical and hormonal treatments. But that's not all. Consider the surprise, disgust and consternation that ensued when, in 1996, the following photograph appeared in newspapers and on television:

生物工程本身并没有什么新鲜事，因为人们已经使用它来改变自己和其他生物数千年了。一个简单的例子是阉割。人类在大约10,000年前开始阉割公牛以创造牛。牛性格比较温顺，因此更容易训练成拉犁的工具。人类也会阉割自己的年轻男性，以创造出拥有迷人声线的女高音歌手以及可信任的太监来管理苏丹的后宫。但我们最近对生物机制的理解在细胞和核水平上的进展，却开启了以前难以想象的可能性。例如，现在我们不仅可以阉割男人，还可以通过手术和荷尔蒙治疗来改变他的性别。但这还不是全部。1996年，下面的照片出现在报纸和电视上时，引起了惊讶、厌恶和困惑：



46. A mouse on whose back scientists grew an 'ear' made of cattle cartilage cells. It is an eerie echo of the lion-man statue from the Stadel

Cave. Thirty thousand years ago, humans were already fantasising about combining different species. Today, they can actually produce such chimeras .

No, Photoshop was not involved. It's an untouched photo of a real mouse on whose back scientists implanted cattle cartilage cells. The scientists were able to control the growth of the new tissue, shaping it in this case into something that looks like a human ear. The process may soon enable scientists to manufacture artificial ears, which could then be implanted in humans.¹

Even more remarkable wonders can be performed with genetic engineering, which is why it raises a host of ethical, political and ideological issues. And it's not just pious monotheists who object that man should not usurp God's role. Many confirmed atheists are no less shocked by the idea that scientists are stepping into nature's shoes. Animal-rights activists decry the suffering caused to lab animals in genetic engineering experiments, and to the farmyard animals that are engineered in complete disregard of their needs and desires. Human-rights activists are afraid that genetic engineering might be used to create supermen who will make serfs of the rest of us. Jeremiahs offer apocalyptic visions of bio-dictatorships that will clone fearless soldiers and obedient workers. The prevailing feeling is that too many opportunities are opening too quickly and that our ability to modify genes is outpacing our capacity for making wise and far-sighted use of the skill.

46. 科學家在老鼠的背上培育了一個由牛軟骨細胞製成的「耳朵」。這是斯塔德爾洞穴的獅人雕像的一個詭異的回音。三萬年前，人類已經開始幻想結合不同的物種。如今，他們實際上可以製造出這樣的嵌合體。不，這不是經過Photoshop處理的。這是一張真實的照片，顯示在老鼠的背上植入了牛軟骨細胞。科學家能夠控制新組織的生長，並在這個例子中將其塑造成類似人耳的東西。這個過程可能很快就能讓科學家製造出人造耳朵，然後植入人體。遺傳工程可以實現更多令人驚奇的奇跡，這就是為什麼它引起了一系列倫理、政治和意識形態上的問題。並且不僅是虔誠的一神論者反對人類搶占上帝的角色。很多堅定的無神論者也對科學家插手自然的行為感到震驚。動物權利活動家譴責遺傳工程實驗導致的實驗動物的痛苦，以及對農場動物的完全不顧他們需要和欲望的工程。人權活動家擔心遺傳工程可能被用來創造

超人，他們將使我們其他人成為農奴。噤聲者提供了生化獨裁政權的啟示，他們將克隆無畏的士兵和聽命的工人。普遍的感覺是，太多的機會正在迅速地敞開，而我們修改基因的能力正在超越我們的智慧和遠見。

The result is that we're at present using only a fraction of the potential of genetic engineering. Most of the organisms now being engineered are those with the weakest political lobbies – plants, fungi, bacteria and insects. For example, lines of *E. coli*, a bacterium that lives symbiotically in the human gut (and which makes headlines when it gets out of the gut and causes deadly infections), have been genetically engineered to produce biofuel.² *E. coli* and several species of fungi have also been engineered to produce insulin, thereby lowering the cost of diabetes treatment.³ A gene extracted from an Arctic fish has been inserted into potatoes, making the plants more frost-resistant.⁴

A few mammals have also been subject to genetic engineering. Every year the dairy industry suffers billions of dollars in damages due to mastitis, a disease that strikes dairy-cow udders. Scientists are currently experimenting with genetically engineered cows whose milk contains lysostaphin, a biochemical that attacks the bacteria responsible for the disease.⁵ The pork industry, which has suffered from falling sales because consumers are wary of the unhealthy fats in ham and bacon, has hopes for a still-experimental line of pigs implanted with genetic material from a worm. The new genes cause the pigs to turn bad omega 6 fatty acid into its healthy cousin, omega 3.⁶

結果是，我們目前只使用了基因工程的一小部分潛力。現在正在進行基因工程的大多數生物都是政治遊說最弱的植物、真菌、細菌和昆蟲。例如，生活在人體腸道共生的大腸桿菌（當它從腸道中跑出來引起致命感染時會成為新聞頭條）已經被基因工程改造，用來生產生物燃料。大腸桿菌和幾種真菌也被改造以生產胰島素，從而降低糖尿病治療的成本。從北極魚萃取的基因已經插入馬鈴薯中，使植物更能抵抗寒冷。一些哺乳動物也被遺傳工程改造過。每年奶業因乳腺炎而蒙受數十億美元的損失。科學家目前正在試驗基因工程奶牛，其乳汁含有溶菌酶，可以攻擊導致該疾病的細菌。另一个例子是豬肉行业，由于消费者对火腿和熏肉中不健康的脂肪持谨慎态度，销售额正在下

降，而有望改变这种现状的是一种还处于实验阶段的猪。它们植入了来自蠕虫的基因，并使猪把不良的ω-6脂肪酸转化为其健康的表兄ω-3脂肪酸。

The next generation of genetic engineering will make pigs with good fat look like child's play. Geneticists have managed not merely to extend sixfold the average life expectancy of worms, but also to engineer genius mice that display much-improved memory and learning skills.⁷ Voles are small, stout rodents resembling mice, and most varieties of voles are promiscuous. But there is one species in which boy and girl voles form lasting and monogamous relationships. Geneticists claim to have isolated the genes responsible for vole monogamy. If the addition of a gene can turn a vole Don Juan into a loyal and loving husband, are we far off from being able to genetically engineer not only the individual abilities of rodents (and humans), but also their social structures?⁸

下一代基因工程將使得豬的良好脂肪看起來就像小孩的遊戲一樣。遺傳學家不僅成功延長了蟲子平均壽命的6倍，還創造了具有大幅改進記憶和學習能力的天才老鼠。7草鼠是小巧、矮胖的啮齒動物，類似老鼠，大多數草鼠品種都是雜交的。但有一種品種，公草鼠和母草鼠可以形成長久的、一夫一妻的關係。遺傳學家聲稱已經分離了負責草鼠一夫一妻制的基因。如果添加一個基因就可以把草鼠唐璜變成一個忠誠而有愛心的丈夫，那麼我們離可以基因工程不僅是啮齒動物（人類）的個體能力，還有它們的社會結構還有多遠呢？⁸

The Return of the Neanderthals

But geneticists do not only want to transform living lineages. They aim to revive extinct creatures as well. And not just dinosaurs, as in *Jurassic Park*. A team of Russian, Japanese and Korean scientists has recently mapped the genome of ancient mammoths, found frozen in the Siberian ice. They now plan to take a fertilised egg-cell of a present-day elephant, replace the elephantine DNA with a reconstructed mammoth DNA, and implant the egg in the womb of an elephant. After about twenty-two months, they expect the first mammoth in 5,000 years to be born.⁹

But why stop at mammoths? Professor George Church of Harvard University recently suggested that, with the completion of the Neanderthal Genome Project, we can now implant reconstructed Neanderthal DNA into a Sapiens ovum, thus producing the first Neanderthal child in 30,000 years. Church claimed that he could do the job for a paltry \$30 million. Several women have already volunteered to serve as surrogate mothers. [10](#)

遺傳學家不僅想改變現有生命。他們還想復活已滅絕的生物。這並不僅止於像《侏羅紀公園》中般的恐龍。一個由俄羅斯、日本和韓國科學家組成的團隊最近對發現於西伯利亞冰中的古代猛獁的基因組進行了重建。他們現在計劃採集現代大象的受精卵，用復原的猛獁DNA取代大象的DNA，再將卵子植入一頭大象的子宮。大約22個月後，他們預計將會誕生5000年以來的第一頭猛獁。但為什麼止於猛獁呢？哈佛大學的George Church教授最近提議，隨著尼安德特人基因組項目的完成，我們現在可以將復原的尼安德特人DNA植入現代智人的卵子，從而誕生出在30000年以前的第一個尼安德特兒童。Church聲稱他可以用僅僅3000萬美元就完成這項工作。已有幾位婦女自願擔當代孕母親。

What do we need Neanderthals for? Some argue that if we could study live Neanderthals, we could answer some of the most nagging questions about the origins and uniqueness of *Homo sapiens*. By comparing a Neanderthal to a *Homo sapiens* brain, and mapping out where their structures differ, perhaps we could identify what biological change produced consciousness as we experience it. There's an ethical reason, too – some have argued that if *Homo sapiens* was responsible for the extinction of the Neanderthals, it has a moral duty to resurrect them. And having some Neanderthals around might be useful. Lots of industrialists would be glad to pay one Neanderthal to do the menial work of two Sapiens.

But why stop even at Neanderthals? Why not go back to God's drawing board and design a better Sapiens? The abilities, needs and desires of *Homo sapiens* have a genetic basis, and the Sapiens genome is no more complex than that of voles and mice. (The mouse genome contains about 2.5 billion nucleobases, the Sapiens genome about 2.9 billion bases – meaning the latter is only 14 per cent larger.) [11](#) In the medium range – perhaps in a few decades – genetic engineering and other forms of biological engineering might enable us to make far-reaching alterations not only to our physiology, immune system

and life expectancy, but also to our intellectual and emotional capacities. If genetic engineering can create genius mice, why not genius humans? If it can create monogamous voles, why not humans hard-wired to remain faithful to their partners?

我們需要尼安德特人嗎？一些人認為，如果我們能夠研究活著的尼安德特人，我們可以回答一些有關智人起源和獨特性的最糾結的問題。通過比較尼安德特人和智人大腦的差異之處，並繪制出它們的結構，或許我們可以確定什麼生物學上的改變產生了我們經驗到的意識。還有倫理原因--一些人認為如果智人負責尼安德特人絕種，那麼它有道德責任使它們復活。而擁有一些尼安德特人可能會很有用。許多工業家會樂意支付一個尼安德特人來做兩個智人的苦力。但為什麼止步於尼安德特人呢？為什麼不回到上帝的設計中心，設計一個更好的智人？智人的能力、需求和欲望都有一個基因基礎，而智人基因組的複雜程度不比田鼠和老鼠的基因組更複雜。（老鼠基因組含有約25億個核苷酸，智人基因組約29億個鹼基--這意味著後者只比前者大14%。）在中程範圍內--也許在幾十年內--基因工程和其他形式的生物工程技術可能使我們能夠對我們的生理、免疫系統、壽命以及智力和情感能力進行深遠的改變。如果基因工程可以創造天才老鼠，為什麼不創造天才人類？如果它能創造忠於伴侶的田鼠，為什麼不能創造內在就是忠於伴侶的人？

The Cognitive Revolution that turned *Homo sapiens* from an insignificant ape into the master of the world did not require any noticeable change in physiology or even in the size and external shape of the Sapiens brain. It apparently involved no more than a few small changes to internal brain structure. Perhaps another small change would be enough to ignite a Second Cognitive Revolution, create a completely new type of consciousness, and transform *Homo sapiens* into something altogether different.

True, we still don't have the acumen to achieve this, but there seems to be no insurmountable technical barrier preventing us from producing superhumans. The main obstacles are the ethical and political objections that have slowed down research on humans. And no matter how convincing the ethical arguments may be, it is hard to see how they can hold back the next step for long, especially if what is at stake is the possibility of prolonging human life

indefinitely, conquering incurable diseases, and upgrading our cognitive and emotional abilities.

認知革命將智人從一隻微不足道的猿猴轉變為世界的主宰，並不需要明顯的生理變化，甚至不需要智人大腦的大小和外部形狀發生任何變化。它似乎僅僅涉及內部腦部結構的微小變化。也許另一個小變化足以引爆第二次認知革命，創造一種全新的意識類型，並將智人轉變為完全不同的東西。確實，我們仍然沒有足夠的見識來實現這一點，但似乎沒有什麼不可逾越的技術障礙會阻止我們生產超人類。主要障礙是道德和政治上的反對，這已經拖延了對人類的研究。無論道德論據多麼有說服力，都很難看到它們能夠長時間阻礙下一步的進展，尤其是如果問題是無限延長人類壽命、征服不治之症，以及提升我們的認知和情感能力。

What would happen, for example, if we developed a cure for Alzheimer's disease that, as a side benefit, could dramatically improve the memories of healthy people? Would anyone be able to halt the relevant research? And when the cure is developed, could any law enforcement agency limit it to Alzheimer's patients and prevent healthy people from using it to acquire super-memories?

It's unclear whether bioengineering could really resurrect the Neanderthals, but it would very likely bring down the curtain on *Homo sapiens*. Tinkering with our genes won't necessarily kill us. But we might fiddle with *Homo sapiens* to such an extent that we would no longer be *Homo sapiens*.

Bionic Life

There is another new technology which could change the laws of life: cyborg engineering. Cyborgs are beings which combine organic and inorganic parts, such as a human with bionic hands. In a sense, nearly all of us are bionic these days, since our natural senses and functions are supplemented by devices such as eyeglasses, pacemakers, orthotics, and even computers and mobile phones (which relieve our brains of some of their data storage and processing burdens). We stand poised on the brink of becoming true cyborgs, of having inorganic features that are inseparable from our bodies, features that modify our abilities, desires, personalities and identities.

例如，假設我們發現了能治愈阿茲海默症的方法，同時它也能大幅度提高健康人的記憶力，會發生什麼事情呢？有人能夠阻止相關的研究嗎？當這個方法開發出來後，任何執法機構能夠限制只供阿茲海默症患者使用，防止健康人使用它來獲得超級記憶嗎？目前尚不清楚生物工程是否能真正地復活尼安德特人，但它很有可能對智人帶來嚴重後果。修改基因不一定會殺死我們，但我們可能會對智人進行大量改造，從而不再是真正的智人。還有一種新技術，可以改變生命法則：契合工程。契合體是一種將有機和無機部分結合在一起的存在，例如一個配備有仿生手臂的人類。在某種程度上，我們大多數人現在都是仿生體，因為我們的自然感知和功能是通過設備（例如眼鏡，心臟起搏器，矯形器和甚至計算機和手機）來補充的（這些設備減輕了我們的大腦存儲和處理的負擔）。我們正處於成為真正的契合體的邊緣，具有不可分割的無機特徵，這些特徵修改了我們的能力，渴望，個性和身份。

The Defense Advanced Research Projects Agency (DARPA), a US military research agency, is developing cyborgs out of insects. The idea is to implant electronic chips, detectors and processors in the body of a fly or cockroach, which will enable either a human or an automatic operator to control the insect's movements remotely and to absorb and transmit information. Such a fly could be sitting on the wall at enemy headquarters, eavesdrop on the most secret conversations, and if it isn't caught first by a spider, could inform us exactly what the enemy is planning. ¹² In 2006 the US Naval Undersea Warfare Center reported its intention to develop cyborg sharks, declaring, 'NUWC is developing a fish tag whose goal is behaviour control of host animals via neural implants.' The developers hope to identify underwater electromagnetic fields made by submarines and mines, by exploiting the natural magnetic detecting capabilities of sharks, which are superior to those of any man-made detectors. ¹³

美國國防高級研究計畫局（DARPA）是一個美國軍事研究機構，正在利用昆蟲開發人工生物。其想法是將電子晶片、探測器和處理器植入蒼蠅或蟑螂的身體內，使人類或自動操作者可以遠程控制昆蟲的運動並吸收和傳遞信息。這樣的一只蒼蠅可以坐在敵方指揮部的牆上，偷聽最機密的對話，如果它沒有被蜘蛛捉住，可以告訴我們敵人正在計劃什麼。美國海軍海底戰爭中心在2006年宣布其意圖開發人工鯊魚，

宣稱“NUWC正在開發一種魚標，其目標是通過神經植入物對宿主動物的行為進行控制”。開發者希望利用鯊魚天生優於任何人造探測器的自然磁性檢測能力，識別由潛艇和水雷產生的水下電磁場。

Sapiens, too, are being turned into cyborgs. The newest generation of hearing aids are sometimes referred to as ‘bionic ears’. The device consists of an implant that absorbs sound through a microphone located in the outer part of the ear. The implant filters the sounds, identifies human voices, and translates them into electric signals that are sent directly to the central auditory nerve and from there to the brain. [14](#)

Retina Implant, a government-sponsored German company, is developing a retinal prosthesis that may allow blind people to gain partial vision. It involves implanting a small microchip inside the patient’s eye. Photocells absorb light falling on the eye and transform it into electrical energy, which stimulates the intact nerve cells in the retina. The nervous impulses from these cells stimulate the brain, where they are translated into sight. At present the technology allows patients to orientate themselves in space, identify letters, and even recognise faces. [15](#)

人類也正在被轉變為半機械人。最新一代的助聽器有時被稱為「仿生耳」。該設備包括一個植入體，通過位於耳朵外部的麥克風吸收聲音。該植入物過濾聲音，識別人類聲音，並將其翻譯成電信號直接發送到中央聽覺神經，再從那裡發送到大腦。Retina Implant是一家由德國政府贊助的公司，正在開發一種視網膜植入物，可以讓盲人獲得部分視力。它涉及在患者的眼睛內植入一個小型微芯片。光電池吸收落在眼睛上的光，將其轉化為電能，以刺激視網膜中的完好神經細胞。來自這些細胞的神經脈衝刺激大腦，在那裡被翻譯成視覺。目前，該技術允許患者在空間中定位自己，識別字母，甚至識別面孔。

Jesse Sullivan, an American electrician, lost both arms up to the shoulder in a 2001 accident. Today he uses two bionic arms, courtesy of the Rehabilitation Institute of Chicago. The special feature of Jesse’s new arms is that they are operated by thought alone. Neural signals arriving from Jesse’s brain are translated by micro-computers into electrical commands, and the arms move. When Jesse wants to raise his arm, he does what any normal person unconsciously does – and the arm rises. These arms can

perform a much more limited range of movements than organic arms, but they enable Jesse to carry out simple daily functions. A similar bionic arm has recently been outfitted for Claudia Mitchell, an American soldier who lost her arm in a motorcycle accident. Scientists believe that we will soon have bionic arms that will not only move when willed to move, but will also be able to transmit signals back to the brain, thereby enabling amputees to regain even the sensation of touch! [16](#)

美國電工傑西·薩利文於2001年遭遇事故，失去了雙臂直至肩膀。如今，他使用的兩支仿生手臂由芝加哥復健研究所提供。傑西新手臂的特殊之處在於，它們僅由思想操作。傑西大腦發出的神經信號被微型電腦翻譯成電動指令，手臂隨即動起來。當傑西想舉起手臂時，他不自覺地做了任何正常人所做的事情，手臂就會上升。這些手臂的動作範圍比有機手臂更有限，但它們讓傑西能夠執行簡單的日常功能。一種類似的仿生手臂最近也為美國士兵克勞迪婭·米切爾配備了，她在一次摩托車事故中失去了手臂。科學家相信，不久的將來，我們將擁有可以不僅僅聽從意願移動，還能傳回信號到大腦的仿生手臂，從而讓截肢者甚至能夠恢復觸感的手臂！



[47.](#) Jesse Sullivan and Claudia Mitchell holding hands. The amazing thing about their bionic arms is that they are operated by thought .

At present these bionic arms are a poor replacement for our organic originals, but they have the potential for unlimited development. Bionic arms, for example, can be made far more powerful than their organic kin, making even a boxing champion feel like a weakling. Moreover, bionic arms have the advantage that they can be replaced every few years, or detached from the body and operated at a distance.

Scientists at Duke University in North Carolina have recently demonstrated this with rhesus monkeys whose brains have been implanted with electrodes. The electrodes gather signals from the brain and transmit them to external devices. The monkeys have been trained to control detached bionic arms and legs through thought alone. One monkey, named Aurora, learned to thought-control a detached bionic arm while simultaneously moving her two organic arms. Like some Hindu goddess, Aurora now has three arms, and her arms can be located in different rooms – or even cities. She can sit in her North Carolina lab, scratch her back with one hand, scratch her head with a second hand, and simultaneously steal a banana in New York (although the ability to eat a purloined fruit at a distance remains a dream). Another rhesus monkey, Idoya, won world fame in 2008 when she thought-controlled a pair of bionic legs in Kyoto, Japan, from her North Carolina chair. The legs were twenty times Idoya's weight. [17](#)

47. 傑西·沙利文 (Jesse Sullivan) 和克勞迪婭·米歇爾 (Claudia Mitchell) 手拉手。關於他們的仿生手臂驚人的事情是，它們是通過思維操作的。目前，這些仿生手臂是我們有機手臂的不良替代品，但它們具有無限發展潛力。例如，仿生手臂可以比有機手臂更強大，使得拳擊冠軍感到自己像個弱者。此外，仿生手臂的優勢在於它們可以每隔幾年更換一次，或者從身體上分離出來並遠程操作。北卡羅來納州杜克大學的科學家最近通過植入電極的方式對恒河猴進行了演示。這些電極收集來自大腦的信號並將它們傳輸到外部設備。猴子們已經經過訓練，可以通過思維單獨控制分離的仿生手臂和腿。其中一隻名為阿烏拉 (Aurora) 的猴子學會了思考控制分離的仿生手臂，同時移動她的兩個有機手臂。像一些印度教女神一樣，阿烏拉現在有三條手臂，她的手臂可以位於不同的房間-甚至不同的城市。她可以坐在她的北卡羅來納實驗室裡，用一隻手揉揉背，用第二隻手揉揉頭，同時在紐約偷一根香蕉（雖然遠程吃偷來的水果的能力仍然是夢想）。另一隻恒河猴伊多亞 (Idoya) 在2008年贏得了世界聲譽，當時她從她的北

卡羅來納椅子上思考控制了一對在日本京都的仿生腿。那雙腿的重量是Idoya的20倍。¹⁷

Locked-in syndrome is a condition in which a person loses all or nearly all her ability to move any part of her body, while her cognitive abilities remain intact. Patients suffering from the syndrome have up till now been able to communicate with the outside world only through small eye movements. However, a few patients have had brain-signal-gathering electrodes implanted in their brains. Efforts are being made to translate such signals not merely into movements but also into words. If the experiments succeed, locked-in patients could finally speak directly with the outside world, and we might eventually be able to use the technology to read other peoples minds.¹⁸

Yet of all the projects currently under development, the most revolutionary is the attempt to devise a direct two-way brain-computer interface that will allow computers to read the electrical signals of a human brain, simultaneously transmitting signals that the brain can read in turn. What if such interfaces are used to directly link a brain to the Internet, or to directly link several brains to each other, thereby creating a sort of Inter-brain-net? What might happen to human memory, human consciousness and human identity if the brain has direct access to a collective memory bank? In such a situation, one cyborg could, for example, retrieve the memories of another – not hear about them, not read about them in an autobiography, not imagine them, but directly remember them as if they were his own. Or her own. What happens to concepts such as the self and gender identity when minds become collective? How could you know thyself or follow your dream if the dream is not in your mind but in some collective reservoir of aspirations?

「鎖定症候群」是一種疾病，患者失去了全部或幾乎全部的身體活動能力，但認知能力仍完整。目前，患者只能透過眼部微小動作與外界溝通。然而，一些患者已在大腦中植入了腦信號接收電極，正在努力將這些信號轉化成語言。如果實驗成功，被鎖定的患者將能夠與外界直接交流，我們最終可能能夠利用這項技術讀取其他人的思維。然而，所有正在開發的項目中，最具革命性的是設計一種直接雙向腦-計算機界面的嘗試，使電腦能夠讀取人腦的電信號，同時傳送信號供腦讀取。如果這些接口用於將人腦直接連接到互聯網上，或將多個人的

大腦直接連接到彼此上，是否會創造一種「大腦網絡」？當大腦可以直接訪問團體記憶庫時，會發生什麼事情，例如人類的記憶、意識和身份認同？在這種情況下，一個人類機械人可以檢索另一個人的記憶不是聽說它們，也不是在自傳中讀到它們，也不是想像它們，而是直接記住它們，就好像它們是他自己的記憶一樣。當思想變得共同時，像自己和性別認同這樣的觀念會發生什麼變化？如果夢想不在你的腦海中，而是在某個集體的渴望之中，你如何了解自己或跟隨自己的夢想呢？

Such a cyborg would no longer be human, or even organic. It would be something completely different. It would be so fundamentally another kind of being that we cannot even grasp the philosophical, psychological or political implications.

Another Life

The third way to change the laws of life is to engineer completely inorganic beings. The most obvious examples are computer programs and computer viruses that can undergo independent evolution.

The field of genetic programming is today one of the most interesting spots in the computer science world. It tries to emulate the methods of genetic evolution. Many programmers dream of creating a program that could learn and evolve completely independently of its creator. In this case, the programmer would be a *primum mobile*, a first mover, but his creation would be free to evolve in directions neither its maker nor any other human could ever have envisaged.

這樣的半機械人已經不再是人類，甚至不再是有機體，它是一些完全不同的東西。它是如此根本的另類生物，以至於我們無法理解其哲學、心理或政治的意義。改變生命法則的第三種方式是創造完全無機的生物。最明顯的例子是計算機程序和計算機病毒，它們可以經歷獨立進化。遺傳編程領域今天是電腦科學界最有趣的地方之一。它試圖模擬基因進化的方法。許多程序員夢想著創建一個能夠完全獨立於其創造者學習和進化的程序。在這種情況下，程序員將是第一推手，但他的創造將可以自由地在沒有任何人能夠預見的方向上進化。

A prototype for such a program already exists – it's called a computer virus. As it spreads through the Internet, the virus replicates itself millions upon millions of times, all the while being chased by predatory antivirus programs and competing with other viruses for a place in cyberspace. One day when the virus replicates itself a mistake occurs – a computerised mutation. Perhaps the mutation occurs because the human engineer programmed the virus to make occasional random replication mistakes. Perhaps the mutation was due to a random error. If, by chance, the modified virus is better at evading antivirus programs without losing its ability to invade other computers, it will spread through cyberspace. If so, the mutants will survive and reproduce. As time goes by, cyberspace would be full of new viruses that nobody engineered, and that undergo non-organic evolution.

這樣的計畫已經有原型存在 – 它就是電腦病毒。當它在網路上擴散時，病毒會一直大量複製自己，同時被獵捕的防毒軟體追蹤，並與其他病毒競爭在網路上的一席之地。當某一天病毒自我複製時出現了一個錯誤 – 電腦化的突變。也許是因為人類工程師將病毒設計成偶爾會有隨機的複製錯誤而發生突變。或者也可能是由於隨機性的錯誤所導致的。如果，這個經過改良的病毒能夠更好地逃避防毒軟體的監控，同時不失其侵犯其他電腦的能力，它就會在網路上蔓延。如果是這樣的話，這些異變體就會存活並繁殖。隨著時間的推移，網路上就會充滿了沒有人工設計，並且經歷非有機進化的新型病毒。

Are these living creatures? It depends on what you mean by 'living creatures'. They have certainly been produced by a new evolutionary process, completely independent of the laws and limitations of organic evolution.

Imagine another possibility – suppose you could back up your brain to a portable hard drive and then run it on your laptop. Would your laptop be able to think and feel just like a Sapiens? If so, would it be you or someone else? What if computer programmers could create an entirely new but digital mind, composed of computer code, complete with a sense of self, consciousness and memory? If you ran the program on your computer, would it be a person? If you deleted it could you be charged with murder?

We might soon have the answer to such questions. The Human Brain Project, founded in 2005, hopes to recreate a complete human brain inside a computer, with electronic circuits in the computer emulating neural networks in the brain. The project's director has claimed that, if funded properly, within a decade or two we could have an artificial human brain inside a computer that could talk and behave very much as a human does. If successful, that would mean that after 4 billion years of milling around inside the small world of organic compounds, life will suddenly break out into the vastness of the inorganic realm, ready to take up shapes beyond our wildest dreams. Not all scholars agree that the mind works in a manner analogous to today's digital computers – and if it doesn't, present-day computers would not be able to simulate it. Yet it would be foolish to categorically dismiss the possibility before giving it a try. In 2013 the project received a grant of €1 billion from the European Union. [19](#)

這些是生物嗎？這要看你所謂的「生物」指的是什麼。它們絕對是由一個新的演化過程產生的，完全獨立於有機演化的法則和限制之外。想像另一種可能性——假設你能夠將你的大腦備份到一個可攜式硬碟中，然後在筆記本電腦上運行。你的筆記本電腦能否像智人一樣思考和感受？如果是這樣，它會是你還是別人？如果計算機程序員能夠創建一個完全由計算機代碼組成的全新數字思維，包括自我意識、意識和記憶，那會怎樣？如果在你的電腦上運行該程序，那它會是一個人嗎？如果你刪除它，你會被指控謀殺嗎？我們可能很快就能得到這些問題的答案。2005年成立的「人類大腦計畫」希望在電腦內創建一個完整的人類大腦，通過電子電路模擬大腦內的神經網絡。該項目的項目總監聲稱，如果得到適當的資金支持，十年或二十年內我們就可以在電腦內擁有一個能夠像人類一樣交談和行為的人工智能大腦。如果成功的話，這將意味著，在4億年的有機化合物交織中過了這麼長時間後，生命將突然爆發到無機領域的廣闊之中，並準備超越我們最狂野的夢想。不是所有學者都同意大腦的運作方式與今天的數字計算機相似——如果不是這樣，現今的計算機將無法模擬它。然而，在給它一個嘗試前，要毫不含糊地排除這種可能性是愚蠢的。2013年，該項目從歐盟獲得了10億歐元的補助。[19](#)

The Singularity

Presently, only a tiny fraction of these new opportunities have been realised. Yet the world of 2014 is already a world in which culture is releasing itself from the shackles of biology. Our ability to engineer not merely the world around us, but above all the world inside our bodies and minds, is developing at breakneck speed. More and more spheres of activity are being shaken out of their complacent ways. Lawyers need to rethink issues of privacy and identity; governments are faced with rethinking matters of health care and equality; sports associations and educational institutions need to redefine fair play and achievement; pension funds and labour markets should readjust to a world in which sixty might be the new thirty. They must all deal with the conundrums of bioengineering, cyborgs and inorganic life.

目前，只有極少數這些新機會已經被實現。然而，2014年的世界已經是一個文化正在從生物的桎梏中解放的世界。我們能夠不僅工程化我們周圍的世界，而且還能進一步發展我們的身體和心靈世界，這一能力正在飛快地發展中。越來越多的活動領域正在擺脫它們的自滿方式。律師需要重新考慮隱私和身份等問題；政府面臨重新思考醫療保健和平等等問題。體育協會和教育機構需要重新定義公平競爭和成就；退休金和勞動力市場應該適應一個60歲可能是新的30歲的世界。他們都必須處理生物工程，半機械化人和無機生命的難題。

Mapping the first human genome required fifteen years and \$3 billion. Today you can map a person's DNA within a few weeks and at the cost of a few hundred dollars. ²⁰ The era of personalized medicine – medicine that matches treatment to DNA – has begun. The family doctor could soon tell you with greater certainty that you face high risks of liver cancer, whereas you needn't worry too much about heart attacks. She could determine that a popular medication that helps 92 per cent of people is useless to you, and you should instead take another pill, fatal to many people but just right for you. The road to near-perfect medicine stands before us.

However, with improvements in medical knowledge will come new ethical conundrums. Ethicists and legal experts are already wrestling with the thorny issue of privacy as it relates to DNA. Would insurance companies be entitled to ask for our DNA scans and to raise premiums if they discover a genetic tendency to reckless behaviour? Would we be required to fax our DNA, rather than our CV, to potential employers? Could an employer favour a

candidate because his DNA looks better? Or could we sue in such cases for 'genetic discrimination'? Could a company that develops a new creature or a new organ register a patent on its DNA sequences? It is obvious that one can own a particular chicken, but can one own an entire species?

繪製人類基因組曾需要15年和30億美元。今天，您可以在幾週內、僅需數百美元的費用，鑑定一個人的DNA。個人化醫療時代，即將開啟，醫療可以根據DNA進行治療。家庭醫生很快就可以更確定地告訴您，您高患肝癌的風險，而無需太擔心心臟病發作。她可以確定對92%的人有效的流行藥對您沒有用，您應該服用另一種藥物，這可能對許多人致命，但對您正好合適。近乎完美的醫療之路，就在眼前。但是，隨著醫學知識的提高，將出現新的倫理難題。倫理學家和法律專家已經在思考與DNA相關的隱私問題。保險公司是否有權要求我們提供DNA掃描，並在發現遺傳傾向於魯莽行為時提高保費？我們是否需要將DNA傳真給潛在雇主，而不是簡歷？雇主是否可以因為候選人的DNA顯示得更好而擁護該候選人？或者我們是否可以在這種情況下對“基因歧視”提起訴訟？一家開發新生物或新器官的公司是否可以對其DNA序列進行專利申請？顯然，一個人可以擁有一隻雞，但能否擁有整個物種？

Such dilemmas are dwarfed by the ethical, social and political implications of the Gilgamesh Project and of our potential new abilities to create superhumans. The Universal Declaration of Human Rights, government medical programmes throughout the world, national health insurance programmes and national constitutions worldwide recognise that a humane society ought to give all its members fair medical treatment and keep them in relatively good health. That was all well and good as long as medicine was chiefly concerned with preventing illness and healing the sick. What might happen once medicine becomes preoccupied with enhancing human abilities? Would all humans be entitled to such enhanced abilities, or would there be a new superhuman elite?

Our late modern world prides itself on recognising, for the first time in history, the basic equality of all humans, yet it might be poised to create the most unequal of all societies. Throughout history, the upper classes always claimed to be smarter, stronger and generally better than the underclass. They were usually deluding themselves. A baby born to a poor peasant family was

likely to be as intelligent as the crown prince. With the help of new medical capabilities, the pretensions of the upper classes might soon become an objective reality.

這些困境與吉爾伽美什計畫和我們創造超人類的新能力的倫理、社會和政治影響相比顯得微不足道。全球的政府醫療計畫、國家健康保險計畫和全球的憲法承認，一個人道的社會應該給予所有成員公平的醫療治療並使他們保持相對良好的健康狀態。當醫學主要關注預防疾病和治愈病人時，這是很好的。但如果醫學開始專注於增強人類的能力，會發生什麼呢？所有人都有權獲得這種增強的能力嗎？還是會有一個新的超人精英階層？現代社會以識別所有人的基本平等為傲，然而卻可能創造有史以來最不平等的社會。在歷史上，上層階級總是聲稱自己比底層階級更聰明、更強壯、總體而言更好。他們通常是在欺騙自己。一個出生在貧困農家的孩子通常是像皇太子一樣聰明的。隨著新的醫療能力的幫助，上層階級的假裝可能很快成為客觀現實。

This is not science fiction. Most science-fiction plots describe a world in which *Sapiens* – identical to us – enjoy superior technology such as light-speed spaceships and laser guns. The ethical and political dilemmas central to these plots are taken from our own world, and they merely recreate our emotional and social tensions against a futuristic backdrop. Yet the real potential of future technologies is to change *Homo sapiens* itself, including our emotions and desires, and not merely our vehicles and weapons. What is a spaceship compared to an eternally young cyborg who does not breed and has no sexuality, who can share thoughts directly with other beings, whose abilities to focus and remember are a thousand times greater than our own, and who is never angry or sad, but has emotions and desires that we cannot begin to imagine?

這不是科幻小說。大多數科幻情節描述的是一個世界，在這個世界中，像我們一樣的智人擁有著超前的技術，例如光速飛船和激光槍。這些情節中的倫理和政治困境源於我們自己的世界，它們僅是在未來背景下重新創造出我們的情感和社會緊張關係而已。然而，未來技術的真正潛力在於改變智人本身，包括我們的情感和慾望，而不僅僅是我們的車輛和武器。一個寶貴的飛船與一個永輝青春的半機械人相比如何？他們不生育，沒有性別，可以直接與其他生物分享思想，他們

的專注和記憶能力是我們的千倍，從不生氣或難過，但擁有我們無法想像的情感和慾望。

Science fiction rarely describes such a future, because an accurate description is by definition incomprehensible. Producing a film about the life of some super-cyborg is akin to producing *Hamlet* for an audience of Neanderthals. Indeed, the future masters of the world will probably be more different from us than we are from Neanderthals. Whereas we and the Neanderthals are at least human, our inheritors will be godlike.

Physicists define the Big Bang as a singularity. It is a point at which all the known laws of nature did not exist. Time too did not exist. It is thus meaningless to say that anything existed ‘before’ the Big Bang. We may be fast approaching a new singularity, when all the concepts that give meaning to our world – me, you, men, women, love and hate – will become irrelevant. Anything happening beyond that point is meaningless to us.

科幻小說很少描繪這樣的未來，因為一個精確的描述在定義上是無法理解的。製作一部關於超級機械人生活的電影就像是為尼安德特人觀眾製作《哈姆雷特》一樣。事實上，未來的主宰者可能比我們和尼安德特人之間的差異還要大。而我們和尼安德特人至少都是人類，而我們的繼承者將會是神一般的存在。物理學家將宇宙大爆炸定義為奇點。這是一個所有已知的自然法則都不存在的點。時間也不存在。因此，說在宇宙大爆炸之前有什麼存在是毫無意義的。我們可能正迅速接近一個新的奇點，在那個點之後賦予我們的世界含義的所有概念——我、你、男人、女人、愛和恨——都將變得不相關。在那個點之後發生的任何事情對我們來說都是毫無意義的。

The Frankenstein Prophecy

In 1818 Mary Shelley published *Frankenstein*, the story of a scientist who creates an artificial being that goes out of control and wreaks havoc. In the last two centuries, the same story has been told over and over again in countless versions. It has become a central pillar of our new scientific mythology. At first sight, the Frankenstein story appears to warn us that if we

try to play God and engineer life we will be punished severely. Yet the story has a deeper meaning.

The Frankenstein myth confronts *Homo sapiens* with the fact that the last days are fast approaching. Unless some nuclear or ecological catastrophe intervenes, so goes the story, the pace of technological development will soon lead to the replacement of *Homo sapiens* by completely different beings who possess not only different physiques, but also very different cognitive and emotional worlds. This is something most Sapiens find extremely disconcerting. We like to believe that in the future people just like us will travel from planet to planet in fast spaceships. We don't like to contemplate the possibility that in the future, beings with emotions and identities like ours will no longer exist, and our place will be taken by alien life forms whose abilities dwarf our own.

1818年，瑪麗·雪莉出版了《科學怪人》，這是一個科學家創造出人工生命的故事，但最終失去控制並帶來災難。在過去的兩個世紀中，相同的故事一遍又一遍地被不計其數的版本講述。這已成為我們新的科學神話的中心支柱。乍一看，弗蘭肯斯坦故事似乎在警告我們，如果我們試圖扮演上帝並改造生命，我們將受到嚴厲懲罰。然而，這個故事有更深層的意義。弗蘭肯斯坦神話對抗着智人最後日子正在迅速接近的事實。故事說，除非有核或生態災難介入，技術發展的速度將很快導致智人被完全不同的生物取代，這些生物不僅擁有不同的身體，還擁有非常不同的認知和情感世界。這對大多數智人來說是極端令人不安的。我們喜歡相信，在未來，和我們一樣的人將乘坐快速太空船在行星之間旅行。我們不喜歡思考這樣的可能性，在未來，擁有像我們一樣的情感和身份的生物將不再存在，我們的位置將被擺脫我們能力的外星生命體取代。

We somehow find comfort in the idea that Dr Frankenstein created a terrible monster, whom we had to destroy in order to save ourselves. We like to tell the story that way because it implies that we are the best of all beings, that there never was and never will be something better than us. Any attempt to improve us will inevitably fail, because even if our bodies might be improved, you cannot touch the human spirit.

We would have a hard time swallowing the fact that scientists could engineer spirits as well as bodies, and that future Dr Frankensteins could therefore create something truly superior to us, something that will look at us as condescendingly as we look at the Neanderthals.

We cannot be certain whether today's Frankensteins will indeed fulfil this prophecy. The future is unknown, and it would be surprising if the forecasts of the last few pages were realised in full. History teaches us that what seems to be just around the corner may never materialise due to unforeseen barriers, and that other unimagined scenarios will in fact come to pass. When the nuclear age erupted in the 1940S, many forecasts were made about the future nuclear world of the year 2000. When sputnik and *Apollo 11* fired the imagination of the world, everyone began predicting that by the end of the century, people would be living in space colonies on Mars and Pluto. Few of these forecasts came true. On the other hand, nobody foresaw the Internet.

有時我們會從弗蘭肯斯坦博士創造了一個可怕的怪物，而我們必須摧毀它才能拯救自己中找到安慰。我們喜歡這樣講述這個故事，因為它暗示著我們是所有生物中最好的，從來沒有且永遠沒有比我們更好的東西。任何改進我們的企圖都注定失敗，因為即使我們的身體可能得到改進，你也無法觸及人類的精神。如果科學家能像改造身體一樣改造精神，未來的弗蘭肯斯坦博士就可以創造出真正優越於我們的東西，我們也會難以接受這一事實，這個東西會像我們看待尼安德特人一樣看待我們。我們無法確定今天的弗蘭肯斯坦是否會實現這個預言。未來是未知的，如果最近幾頁的預測全部實現，那會讓人很驚訝。歷史教導我們，即使一切看起來就在不久的將來，由於無法預料的障礙，可能永遠無法實現，而其他未曾想象的情景實際上會發生。當核時代在20世紀40年代爆發時，許多關於2000年核世界的預測被作出。當人造衛星和阿波羅11號激發了世界的想象時，每個人都開始預測，到世紀末，人們將在火星和冥王星上的空間殖民地生活。這些預測中很少有實現的，但沒有人能預見互聯網。

So don't go out just yet to buy liability insurance to indemnify you against lawsuits filed by digital beings. The above fantasies – or nightmares – are just stimulants for your imagination. What we should take seriously is the idea that the next stage of history will include not only technological and organisational transformations, but also fundamental transformations in

human consciousness and identity. And these could be transformations so fundamental that they will call the very term ‘human’ into question. How long do we have? No one really knows. As already mentioned, some say that by 2050 a few humans will already be a-mortal. Less radical forecasts speak of the next century, or the next millennium. Yet from the perspective of 70,000 years of Sapiens history, what are a few millennia?

因此，請不要急著去買責任保險來賠償您受到由數字生命體提起的訴訟。以上的幻想或噩夢只是刺激您想像力的東西。我們應該認真對待的是，歷史的下一階段不僅會包括技術和組織的轉型，還會包括人類意識和身份的根本轉變。這些轉變可能如此根本，以至於它們會質疑“人類”這個詞彙本身。我們還有多久？沒有人真正知道。正如已經提到的，一些人說到2050年，一些人將已經成為不死之身的人類。而較不激進的預測則提到下一個世紀或下一個千年。然而，從智人70,000年的歷史來看，幾個千年意味著什麼呢？

If the curtain is indeed about to drop on Sapiens history, we members of one of its final generations should devote some time to answering one last question: what do we want to become? This question, sometimes known as the Human Enhancement question, dwarfs the debates that currently preoccupy politicians, philosophers, scholars and ordinary people. After all, today's debate between today's religions, ideologies, nations and classes will in all likelihood disappear along with *Homo sapiens*. If our successors indeed function on a different level of consciousness (or perhaps possess something beyond consciousness that we cannot even conceive), it seems doubtful that Christianity or Islam will be of interest to them, that their social organisation could be Communist or capitalist, or that their genders could be male or female.

如果說幕布真的快要拉下在智人歷史上，我們這一代人應該把時間花在回答最後一個問題：我們想成為什麼樣的存在？這個問題，有時被稱為人類增強問題，其規模超越了當前占據政治家，哲學家，學者和普通人的辯論。畢竟，今天的宗教，意识形态，国家和社会阶级之间的辩论很可能随着智人的消失而消失。如果我们的后代确实在意识的不同层面上运作（或者可能拥有某种我们无法想象的超越意识的东西），那么基督教或伊斯兰教对他们来说似乎不是很有趣，他们的社

会组织也可能不是共产主义或资本主义，他们的性别也可能不是男性或女性。

And yet the great debates of history are important because at least the first generation of these gods would be shaped by the cultural ideas of their human designers. Would they be created in the image of capitalism, of Islam, or of feminism? The answer to this question might send them careening in entirely different directions.

Most people prefer not to think about it. Even the field of bioethics prefers to address another question, ‘What is it forbidden to do?’ Is it acceptable to carry out genetic experiments on living human beings? On aborted fetuses? On stem cells? Is it ethical to clone sheep? And chimpanzees? And what about humans? All of these are important questions, but it is naïve to imagine that we might simply hit the brakes and stop the scientific projects that are upgrading *Homo sapiens* into a different kind of being. For these projects are inextricably meshed together with the Gilgamesh Project. Ask scientists why they study the genome, or try to connect a brain to a computer, or try to create a mind inside a computer. Nine out of ten times you’ll get the same standard answer: we are doing it to cure diseases and save human lives. Even though the implications of creating a mind inside a computer are far more dramatic than curing psychiatric illnesses, this is the standard justification given, because nobody can argue with it. This is why the Gilgamesh Project is the flagship of science. It serves to justify everything science does. Dr Frankenstein piggybacks on the shoulders of Gilgamesh. Since it is impossible to stop Gilgamesh, it is also impossible to stop Dr Frankenstein.

然而，历史的大辩论之所以重要，是因为至少这些神的第一代将受其人类设计者文化意识的塑造。他们将以资本主义、伊斯兰教还是女权主义的形象被创造出来呢？对于这个问题的答案可能会让他们朝完全不同的方向运动。大多数人不喜欢考虑这个问题。甚至生物伦理学领域也更愿意回答另一个问题：“有哪些行为是被禁止的？”在活人身上进行基因实验合适吗？流产胎儿呢？还是干细胞？克隆绵羊呢？黑猩猩呢？人类呢？所有这些都是重要的问题，但是想象我们可能会简单地刹车并停止升级智人成为一种不同存在的科学项目是天真的。因为这些项目与吉尔伽美什计划紧密联系在一起。询问科学家他们为什么研究基因组，或者尝试连接大脑和电脑，或者尝试在电脑里创建一个

思维。十次中有九次，你会得到同样的标准答案：我们正在这样做是为了治愈疾病和拯救人类的生命。即使在电脑里创建一个思维的影响远比治疗精神疾病更为重大，这仍然是给出的标准辩护理由，因为没有人能反驳。这就是为什么吉尔伽美什计划是科学的旗舰。它用来证明科学的一切做法。弗兰肯斯坦博士搭上了吉尔伽美什的肩膀。既然无法阻止吉尔伽美什，那么也无法阻止弗兰肯斯坦博士。

The only thing we can try to do is to influence the direction scientists are taking. Since we might soon be able to engineer our desires too, perhaps the real question facing us is not ‘What do we want to become?’, but ‘What do we want to want?’ Those who are not spooked by this question probably haven’t given it enough thought.

我們唯一能嘗試的是影響科學家們的方向。由於我們可能很快就能夠操縱自己的慾望，也許真正面臨的問題不應是「我們想變成什麼樣子？」而是「我們想要什麼？」對於這個問題不感到驚嚇的人可能沒有充分地思考。

Afterword: The Animal that Became a God

SEVENTY THOUSAND YEARS AGO, *HOMO sapiens* was still an insignificant animal minding its own business in a corner of Africa. In the following millennia it transformed itself into the master of the entire planet and the terror of the ecosystem. Today it stands on the verge of becoming a god, poised to acquire not only eternal youth, but also the divine abilities of creation and destruction.

Unfortunately, the Sapiens regime on earth has so far produced little that we can be proud of. We have mastered our surroundings, increased food production, built cities, established empires and created far-flung trade networks. But did we decrease the amount of suffering in the world? Time and again, massive increases in human power did not necessarily improve the well-being of individual Sapiens, and usually caused immense misery to other animals.

七萬年前，智人仍是一種微不足道的動物，只在非洲某個角落忙於自己的事情。在接下來的几千年裡，它把自己變成了整個星球的主宰和生態系的恐怖。今天，它即將成為神，準備獲得永恆的青春，以及創造和破壞的神性能力。不幸的是，智人在地球上的統治至今還沒有產生什麼讓我們引以為傲的東西。我們掌握了周圍的環境，增加了食物的生產，建造了城市，建立了帝國，創造了遍布全球的貿易網絡。但我們減少了世界上的苦難嗎？時常地，人類的巨大力量增加並沒有必然地改善個別智人的福祉，而且通常還會給其他動物帶來巨大的痛苦。

In the last few decades we have at last made some real progress as far as the human condition is concerned, with the reduction of famine, plague and war. Yet the situation of other animals is deteriorating more rapidly than ever before, and the improvement in the lot of humanity is too recent and fragile to be certain of.

Moreover, despite the astonishing things that humans are capable of doing, we remain unsure of our goals and we seem to be as discontented as ever. We have advanced from canoes to galleys to steamships to space shuttles – but nobody knows where we're going. We are more powerful than ever before, but have very little idea what to do with all that power. Worse still, humans seem to be more irresponsible than ever. Self-made gods with only the laws of physics to keep us company, we are accountable to no one. We are consequently wreaking havoc on our fellow animals and on the surrounding ecosystem, seeking little more than our own comfort and amusement, yet never finding satisfaction.

在過去的幾十年中，人類在改善人類條件方面取得了一些真正的進展，例如減少了饑荒、瘟疫和戰爭。然而，其他動物的情況比以往任何时候都更加惡化，人類狀況的改善還太新穎和脆弱，無法確定其未來。此外，儘管人類能夠做出驚人的事情，但我們仍不確定自己的目標，而且我們似乎像以往一樣不滿意。我們從獨木舟發展到巨型帆船、蒸汽船、太空飛船，卻不知道我們要去哪裡。我們比以往任何时候都更加強大，但我們對於所有這些權力如何使用卻非常渺茫。更糟的是，人類似乎比以往任何时候都更加不負責任。作為只有物理法則可以作為伴侶的自造神，我們沒有誰需要負責。因此，我們正在對周圍的生態系統和其他動物造成極大的破壞，只是追求舒適和娛樂，卻永遠無法找到滿足。

Is there anything more dangerous than dissatisfied and irresponsible gods who don't know what they want?

有什麼比不滿意、不負責任又不知道自己想要什麼的神更危險的嗎？

Notes

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5 G. R. Summerhayes, 'Application of PIXE-PIGME to Archaeological Analysis of Changing Patterns of Obsidian Use in West New Britain, Papua New Guinea', in *Archaeological Obsidian Studies: Method and Theory*, ed. Steven M. Shackley (New York: Plenum Press, 1998), 129–58.

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16 The Capitalist Creed

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<http://siteresources.worldbank.org/DATSTATISTICS/Resources/GNIPC.pdf> f. 2 我的烘焙坊例子的數學並不是很精確。由於銀行可以在其保管的每一美元中貸款10美元，因此對於存入銀行的每一百萬美元，銀行只能向企業家貸出約909,000美元，而將91,000美元保留在保險箱中。但為了讓讀者更容易理解，我更喜歡使用圓數。此外，銀行並不總是遵守規則。

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