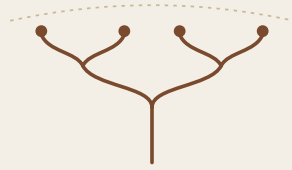


MY OWN READING OF SAPIENS · IN ELEVEN PARTS

SAPIENS

A Brief History of Humankind

Yuval Noah Harari — first published 2011



PART NINE OF ELEVEN

The Blank Space on the Map

Chapter 14: The Discovery of Ignorance

Chapter 15: The Marriage of Science and Empire

“Two continents are named after the man who admitted he did not know what he had found.”

The Scientific Revolution in one fact

READ AND EXPLAINED BY LOVEPREET SINGH

I read the whole book myself. This is what I understood,
written the way I'd explain it to a friend.

Part Eight, in four paragraphs

So this part stands on its own, even if you have not read the last one.

Part Eight was the third glue and the coldest chapter in the book. Harari defines religion as any system of values founded on a belief in a **superhuman order** — rules claimed to come from above human choice. Notice what is missing: gods. That lets in Buddhism, and it also lets in liberalism, communism, capitalism and nationalism, which is the provocation the whole chapter is built for.

He showed how the economy rearranged the heavens. Foragers were animists, with nobody above anybody. Once we owned animals we stopped treating them as persons, and once we needed rain we could not control, we needed somebody above us to ask. Gods became management.

Then Chapter 13, which is short and detonates a lot. The **hindsight fallacy**: everything looks inevitable afterwards, because the explanation is assembled backwards from an ending we already know. In 306 AD nobody would have bet on Christianity, and by 380 it was the state religion of Rome.

And the payload: **ideas are selected for spreading well, not for being good for us**. The celibate priest is the proof — a catastrophe for his genes, a triumph for the idea he carried. What survives is what copies, and nothing in that process is checking on you.

WHERE THIS PART FITS

We are now in Part Four of the book: the last five hundred years, which is where humanity acquires powers that any earlier century would have called magic.

Chapter 14 explains how it started, and the answer is not a discovery. It is an admission.

Chapter 15 asks the question that follows — why Europe, which in 1500 was nobody's idea of the coming power — and gives an answer that is elegant, memorable, and carrying more weight than one idea should.

This is also where the book stops being a story about the past and starts being about us. Everything from here runs into Part Eleven.

A world where ignorance was impossible

You have to understand what came before, or the revolution looks obvious. It was not obvious. It was almost unthinkable.

Around 1500 AD something changed in how humans handled knowledge. To see how big it was, you have to understand the system it replaced, and this is the part I had never properly grasped.

Every great pre-modern tradition of knowledge — religious, philosophical, scholarly — worked on the assumption that **everything important was already known**.

Not by you personally. By the tradition. The gods had revealed it, or the ancient sages had worked it out, and the knowledge was sitting in the texts. So how do you learn something? You study the old books. You read what the wise men wrote. Knowledge means **recovering** what has already been established.

And here is the consequence, which is the interesting bit.

WHAT DO YOU DO WITH A QUESTION NOBODY ANSWERED?

Suppose a medieval European scholar wonders how a spider spins a web.

He looks in the Bible. Nothing.

He looks in the writings of the Church Fathers. Nothing.

He looks in Aristotle. Nothing useful.

So what does he conclude? Not *we do not know this*. He concludes **this is not worth knowing** — because if it mattered, God would have mentioned it, or the sages would have.

That is the system. Ignorance was not a state you could be in. Anything the tradition did not cover was not unknown; it was **unimportant**.

THE THING NOBODY QUESTIONS

Everybody tells this story as though the change was one of **attitude** — that people became humble, stopped being arrogant, admitted they did not know.

That is not quite it, and the difference matters.

What actually appeared was a **category**. Before this, there was no available slot for *a real question with no answer yet, which somebody could go and find out*. You had answered questions, and you had things that were not questions.

The Scientific Revolution did not make people humbler. Plenty of the men involved were insufferable, and several of them thought they personally were about to complete the whole of natural philosophy.

What it did was create a place to put things. A blank line on a form that had never had a blank line on it before.

Once that slot exists, "I don't know" stops being an embarrassing admission of personal failure and becomes a **job description** — and you can hire people to fill it, and fund them, and build institutions around them. That is a change in bureaucracy at least as much as in humility, and it is why Chapter 7's filing cabinet keeps turning out to matter.

Three things that make it different

This is the whole chapter, and the third one is the one people underrate.

One: the willingness to admit ignorance

Modern science starts from **ignoramus** — Latin for *we do not know*. It assumes we do not know everything. It assumes what we currently think we know might be wrong. And it assumes that no theory, however successful or however respected, is beyond challenge.

Newton's physics was the most successful theory in the history of the world for two centuries, and it got revised. Nothing is sacred, including yesterday's science, including the parts everybody currently agrees on. That sounds so obvious now that it barely registers as a claim — which is exactly the measure of how completely this idea won.

Two: observation and mathematics

You do not settle questions by consulting texts or asking who has the most authority. You gather observations and connect them using mathematics. Look, measure, calculate.

The final authority moves from books and elders to **reality** — and reality can contradict whoever is in charge. That is a genuinely radical arrangement, and it is why science and authority have been arguing ever since.

Three: it is expected to produce new powers

This one gets underrated and it is the reason the Scientific Revolution turned into an industrial one instead of remaining a philosophical movement.

Modern science is not knowledge for its own sake. It is expected to produce **technology** — new abilities, new tools, new capacities. A theory that explains beautifully but does nothing is regarded with suspicion. A theory that lets you build something gets taken seriously very quickly.

Knowledge gets judged, partly, by what it lets you do.

The blank space

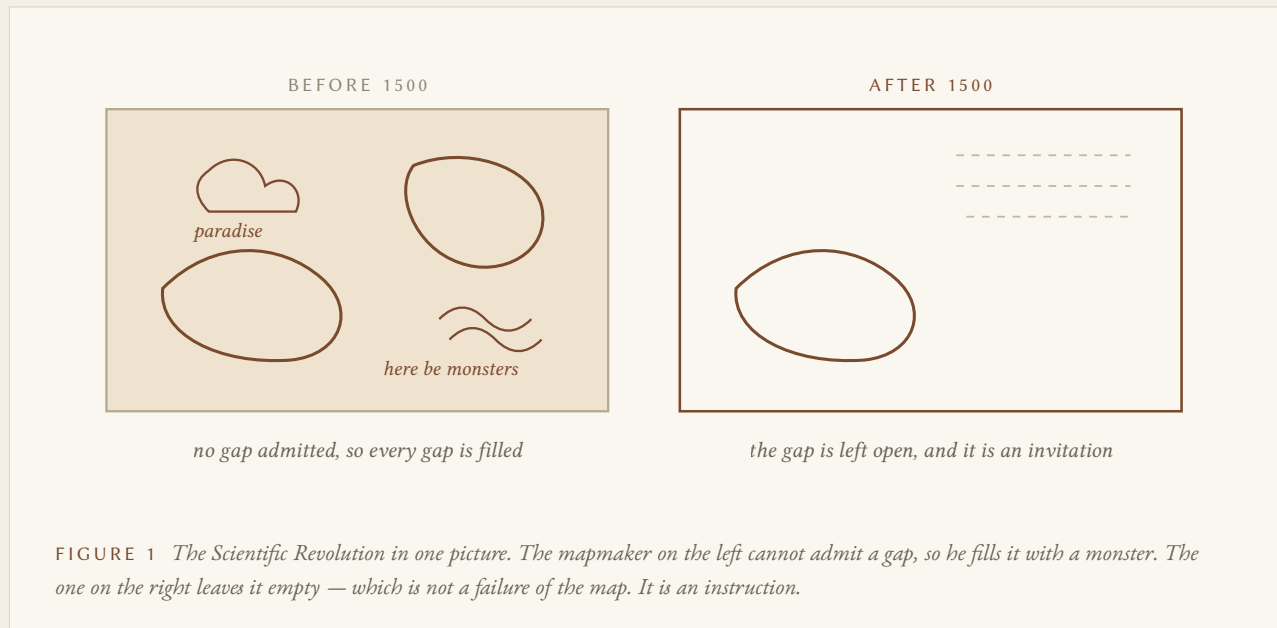
The best image in the whole book, and I have not been able to stop using it.

Look at a medieval European world map. It is **full**. Every space is covered. Where the mapmaker had no information, he drew imaginary continents, sea serpents, monsters, the earthly paradise, the tribes of legend.

There was no empty space, because empty space would have been an admission that something existed which nobody knew about — and in a system where all important knowledge is already written down, that thought has nowhere to go.

Now look at European maps from around 1500 onwards.

They have **blank spaces**. Whole coastlines that simply stop. Oceans that trail off into nothing.



That blank space is the Scientific Revolution in a single picture. The mapmaker is saying, publicly and in his professional capacity: *I do not know what is there*.

And it is not passive. A blank space on a map is an **invitation**. It is somewhere to go. Those maps did not merely record the age of exploration — they helped cause it.

Everybody repeating this lovely image, Harari included, treats the blank space as **an admission of ignorance**.

Read it again from the other side.

A blank space on a European map of Africa, or the Americas, or Australia, was not empty. There were people living there. Those people knew the rivers, the seasons, the coastlines and the passes in enormous detail, and had known them for thousands of years.

So the blank space is not a statement that *nobody knows what is here*. It is a statement that **nobody who counts knows** — and in that quiet move, everybody actually living there stops counting.

This is not a minor point of etiquette. Blank space on a map is very close to the legal doctrine that treats land as belonging to nobody, and that doctrine did an enormous amount of work in the following four centuries. The empty map was not just an invitation to go. It was an argument that there was nothing there to take.

The same page that shows scientific humility shows imperial erasure, and it is the same page. Harari celebrates the first without noticing the second — which is odd, because the very next chapter is about exactly this marriage.

Two Scottish churchmen and the invention of the future

I did not expect to enjoy a section about statistics. This is the best small story in the book.

Mathematics became the language of science, and then one branch of it quietly took over the world: **statistics** — the mathematics of uncertainty, of populations, of probability.

A WORD YOU WILL NEED — PROBABILITY

Probability: the mathematics of how likely something is, when you cannot know for certain.

It sounds obvious now. It was not. For most of history, the future was either determined by God or simply unknowable, and there was no middle setting.

Probability is the middle setting: *I cannot tell you whether this particular man will die next year, and I can tell you, very accurately, how many out of ten thousand such men will.*

Why it matters: that one move is what makes insurance, pensions, banking, clinical trials, quality control and public health possible. It is arguably the most consequential piece of mathematics in ordinary life, and almost nobody is taught where it came from.

Harari's example is two Scottish churchmen, **Alexander Webster** and **Robert Wallace**, in 1744.

They wanted to set up a fund to support the widows and orphans of Presbyterian ministers. Anybody can see the problem. You cannot know how many ministers will die in a given year, or how many will leave widows, or how long those widows will live. It looks like a question with no answer.

But using the new mathematics of probability — building on work by Pascal, Fermat and others — they calculated how many ministers would die each year, how many dependants they would leave, how long the payments would run, and therefore exactly what the premiums had to be.

Their fund started paying out in 1765. Their projections turned out to be extraordinarily accurate.

WHY THIS IS THE BEST STORY IN THE CHAPTER

The organisation that grew out of it became **Scottish Widows**, which still exists.

And the technique became the foundation of the entire modern insurance and pensions industry.

Sit with what happened there. Two clergymen, working on a small charitable problem, produced a method for **calculating a future they could not see** — and that method is now load-bearing for the world economy. Every insurance policy, every pension, every mortgage, every actuarial table descends from the same move.

The Scientific Revolution is usually told through telescopes and falling apples. A great deal of what it actually changed came in through a spreadsheet.

Who is paying for this?

The most important corrective in the chapter, and the one most readers skim.

Now the part that stops this being a celebration.
Science does not fund itself.

Research is expensive. Somebody pays. And the people with the money to pay — governments, armies, corporations, wealthy institutions — pay because they want something. So the questions that get investigated are, to a very large extent, the questions somebody with money and power wanted investigated. Scientists rarely set the agenda. They work on what is funded, and what is funded reflects political, economic and religious interests. The image of pure curiosity following truth wherever it leads is mostly a story told **about** science rather than a description of how it operates.

IN REAL TERMS — THE CLEAREST EXAMPLE

The **Manhattan Project** cost the United States around two billion dollars in 1940s money — a sum no curiosity-driven research programme in history had ever come close to.

It happened because a government at war wanted a weapon. Not because physicists persuaded anybody that nuclear fission was interesting.

And it worked. The war ended, and physics has never been the same, and the discipline's funding, prestige and relationship to government were permanently reshaped by having delivered something a state desperately wanted.

That is the honest version of the Scientific Revolution: an engine of extraordinary power, aimed by whoever is paying for the fuel.

And the project nobody would have dared to name

Harari closes the chapter with something that sounds like science fiction and is not.

Modern science has quietly taken on a project no previous tradition would have attempted: **defeating death**. Every religion and philosophy before this treated death as inevitable and built meaning around accepting it. That is what most of them are *for*.

Modern science increasingly treats death as a **technical problem** — a set of failures in specific systems. And technical problems have solutions. Cancer, heart failure, dementia and ageing itself are being approached as engineering challenges rather than as fate.

He calls this the **Gilgamesh Project**, after the ancient Mesopotamian king who went looking for immortality and failed. His point is that serious researchers, and very large amounts of money, now believe Gilgamesh was simply early.

That thread runs directly into Part Eleven, where it stops being a metaphor.

Why Europe? Because in 1500 you would not have said Europe

The best question in the chapter, and it deserves to be asked more often than it is.

Here is the question Chapter 15 opens with, and it is genuinely good. In 1500, if somebody had asked you which part of the world would run the planet in four hundred years, you would not have said Europe. You would have been mad to.

Europe was a cold, fragmented, plague-scarred peninsula on the western edge of Eurasia, with no particular advantage in wealth, population, technology or organisation.

WHO ACTUALLY LOOKED LIKE THE FUTURE IN 1500

WHY

MING CHINA

The largest and richest economy on Earth, with a sophisticated bureaucracy and technology Europe did not have.

THE OTTOMAN EMPIRE

Had taken Constantinople in 1453 and was pressing into Europe, not the other way round.

THE SAFAVID EMPIRE

Persia. Wealthy, organised, culturally dominant across a huge region.

THE MUGHAL EMPIRE

By the seventeenth century controlling something in the region of a quarter of the world's economy.

And yet by 1850, Europeans ran most of the planet.

Harari's answer is not guns and it is not ships, because the Chinese had both, and better. It is a **mentality**: Europeans developed a particular combination of scientific curiosity and imperial ambition, and the two fed each other.

Both start from the same sentence: *we do not know what is out there, and we should go and find out*. One version of that sentence produces science. The other produces conquest. Europe ran both at once, in the same ships, funded by the same people.

The comparison that makes the case



Between 1405 and 1433, the Chinese admiral **Zheng He** led seven enormous voyages across the Indian Ocean, reaching Indonesia, India, Arabia and East Africa. The fleets ran to hundreds of ships and tens of thousands of men, with vessels far larger than anything Europe possessed.

Compare **Columbus in 1492**: three small ships and about a hundred and twenty men. Zheng He's expedition could have swallowed Columbus's entire fleet without noticing.

And then China stopped. The voyages ended, the fleets were dismantled, the records were neglected. There was no interest in claiming territory, planting colonies or systematically mapping what lay beyond.

Europeans, meanwhile, kept going. Tiny expeditions, dreadful odds, enormous ambition — and every voyage came back with maps, specimens, notes and plans for the next one.

And the detail that seals it

Columbus sailed west believing he would reach East Asia. He landed in the Caribbean and concluded he was near Japan. **He held that belief for the rest of his life** — because he already knew what was out there, the texts said so, and the evidence in front of him got squeezed until it fitted.

A few years later **Amerigo Vespucci** looked at the same coastlines and made the opposite move. He said: this is not Asia. This is a landmass nobody in Europe knew existed.

He admitted ignorance.

And so two entire continents are named after him rather than after Columbus. **The New World is named after the man who admitted he did not know what he was looking at**, and I think that is the whole chapter in one fact.

The same ship

The most uncomfortable idea in this part, and Harari is right about it.

European expeditions were not merely military. They were **scientific**, deliberately, from the start — and the two were not separate departments.

Take **Captain James Cook's** Pacific voyage of 1768. Officially it was an astronomical expedition, sent to observe the transit of Venus across the face of the Sun from Tahiti — a measurement that would help calculate the distance from the Earth to the Sun. Cook carried astronomers, the botanist Joseph Banks, and artists to record what they found. The expedition also demonstrated that scurvy could be prevented by diet, which went on to save an incalculable number of lives at sea.

All of that is genuine science and genuinely valuable.

And the same voyage mapped the Pacific in a way that opened it to European conquest. Australia was claimed. New Zealand and Tasmania followed. The consequences for the peoples living there were catastrophic — the Aboriginal Tasmanians, within a few generations of European arrival, were effectively destroyed as a people.

Same voyage. Same ship. Same funding. Astronomy and annihilation, and nobody on board experienced a contradiction.

The military side is starker still. **Cortés** brought a few hundred men to Mexico and brought down the Aztec Empire. **Pizarro** did the same to the Inca with fewer. Disease and local alliances did enormous work — but so did an asymmetry of knowledge. The Spanish had heard of the Aztecs, had maps, informants, translators and a strategy. The Aztecs had never heard of Spain and had no framework at all for what was arriving.

Knowledge is power, very literally, and only one side had any.

The empire that dug up a past, and the past that ended the empire

The subtlest section in the chapter, and the one closest to home for me.

Empires funded scholarship on an enormous scale, and some of what came out of it is among the finest work of the era.

Napoleon's expedition to Egypt in 1798 carried around a hundred and sixty-five scholars alongside the army. Their work produced the **Rosetta Stone**, which eventually allowed hieroglyphics to be deciphered and handed the world back the ability to read ancient Egypt after fourteen centuries of silence.

In India, **William Jones**, a British judge in Calcutta, studied Sanskrit and observed its deep structural resemblances to Greek and Latin — the observation that led to the recognition of the Indo-European language family, and to modern historical linguistics as a discipline.

Later, **Alexander Cunningham** founded the Archaeological Survey of India. The surveys that followed eventually uncovered **Mohenjo-daro and Harappa** — the Indus Valley Civilisation. A vast, sophisticated urban culture, with planned streets and covered drainage, that nobody had known existed, older than anything in the region's written memory.

WHAT THAT ACTUALLY WAS, LOOKED AT TWICE

It was real scholarship. It recovered genuine history that had been completely lost. Nobody in 1850 knew the Indus cities existed. That is not a small thing, and it was not faked.

It was also imperial infrastructure. Surveys, censuses, classifications, catalogues and gazetteers make a subcontinent **legible** — and a legible place is a governable place. You cannot tax, conscript or police what you cannot describe.

And then it turned. The recovered past became raw material for Indian nationalism. Knowing that the subcontinent had held a civilisation older and more sophisticated than the conquerors' own was extremely useful to people arguing for independence.

The empire dug up a past, and the past helped end the empire. That is the imperial cycle from Part Seven, running through archaeology instead of through law.

And the shadow over all of it

There is a darker branch of the same marriage, and it needs to be named plainly.

Nineteenth-century Europeans needed to explain why they ruled other people, and they turned to science for the explanation. What came out was **scientific racism**: skull measurements, racial classifications, invented hierarchies of human types, published with tables, citations and the full apparatus of scholarship.

It looked exactly like the rest of the science of the period. It used the same journals, the same universities, the same vocabulary of evidence. It was completely wrong. And it was used to justify conquest, slavery, exclusion and eventually genocide.

That is the shadow over this whole part. The same institutions and the same methods that decoded hieroglyphics and cured scurvy also manufactured the intellectual justification for empire — and nothing in the method itself came with a warning label telling anyone which one they were reading.

Where I think he is wrong in these two chapters

The mechanism is well explained. The cause is doing far too much work.

1. The 1500 line flatters Europe

"Europe suddenly admitted ignorance around 1500" is too clean, and by now that is a familiar complaint in this series.

Medieval scholars argued fiercely, revised authorities and ran genuine empirical investigations. Islamic scholars from the ninth to the fourteenth centuries did serious experimental work in optics, medicine and astronomy — **Ibn al-Haytham** was running controlled optical experiments around 1020 AD and writing explicitly about testing claims against observation. Chinese and Indian traditions produced sustained innovation in mathematics, metallurgy, medicine and astronomy.

The line between *traditions that thought they knew everything* and *modern science* is much blurrier than Harari draws it. And drawing it at Europe in 1500 flatters Europe, which is an odd thing to do in a chapter about how Europe was nobody's favourite in 1500.

2. He underplays what was borrowed

Modern science inherited an enormous amount from those traditions. The numerals. The algebra. The astronomical tables and observations. The medical texts. The Greek corpus itself, much of which reached Europe via Arabic translation.

A great deal of the equipment was borrowed, and in this chapter the borrowing gets barely a mention.

3. "A European mentality" is one idea carrying an enormous load

WHERE THE EXPERTS ACTUALLY FIGHT — WHY DID EUROPE RISE?

Harari's answer. A mentality: curiosity plus imperial ambition, feeding each other.

Political fragmentation. Europe was split into dozens of competing states, so an explorer rejected by one king could take his plan to the next one along. Columbus was turned down repeatedly before Spain said yes. In a unified empire, one *no* is the end of the matter — which is more or less what happened to Chinese maritime expansion.

Geography and winds. The Atlantic wind systems make a round trip from Europe to the Americas and back genuinely workable. The equivalent voyages from China were harder and the incentives poorer.

Fiscal and military competition. Constant warfare between small rival states drove innovation in ships, guns, fortification and — crucially — public debt, which let states borrow far beyond their annual income.

American silver. An enormous, unearned windfall of bullion transformed European purchasing power in Asian markets.

Disease. The catastrophe that emptied the Americas before Europeans had to fight seriously for them, which is a fact about immunology rather than about mentality.

Where it stands. This is one of the largest live arguments in economic history and there is no consensus. Most serious accounts use several of the above at once.

What is fair to say about Harari. "They had a curious mindset" is memorable, and it is carrying more weight than a single idea should. It is also unfalsifiable in the way I flagged back in Part One, because any outcome can be explained by a mentality after the fact.

4. The Zheng He comparison is more complicated than it looks

China's withdrawal from the sea had specific, identifiable causes: court factions and the fall of the eunuch administration that had sponsored the voyages, the enormous expense of the fleets, a resurgent military threat on the northern land frontier, and a capital moved inland to Beijing.

It was not a civilisation shrugging at the world. It was a policy decision, made by particular people, for reasons they could have stated.

Harari uses it as evidence about *interest*. It is at least as much evidence about *budgets and factions*, which is much less romantic and probably more useful.

5. And a tension he leaves open

He argues that science's agenda is set by money and power. He then treats scientific knowledge as reliably true.

Both can be right — funders choose the questions, and reality decides the answers — but he never does the work of separating them, and readers routinely take the first half as a reason to distrust the second. Given what has happened to public trust in science since 2011, that is a gap worth naming.

WORTH REMEMBERING

Modern science began with an admission, not a discovery. Before it, anything the texts did not cover was not unknown — it was unimportant. What appeared was a category: a real question with no answer yet.

The blank space on the map is the whole revolution in one image — and it is also imperial erasure, because the space was not empty and the people in it knew perfectly well what was there.

Statistics let humans calculate a future they cannot see. Two Scottish churchmen working out widows' pensions in 1744 laid the foundation of the modern insurance industry.

Science does not fund itself, so the questions asked are largely the questions somebody with money wanted asked. Ask who paid, always.

And science and empire grew up in the same ships. The voyage that measured the transit of Venus opened a continent to conquest, and the institutions that decoded hieroglyphics also manufactured scientific racism.

Words from this part

Everything I stopped to explain, gathered up.

WORD	WHAT IT MEANS
IGNORAMUS	Latin for <i>we do not know</i> . Harari's name for the starting point of modern science.
PROBABILITY	The mathematics of how likely something is when you cannot know for certain. The middle setting between certainty and ignorance.
STATISTICS	The mathematics of populations and uncertainty. Underneath insurance, pensions, medicine and public policy.
GILGAMESH PROJECT	The modern scientific attempt to defeat death, named after the king who tried first and failed.
TRANSIT OF VENUS	Venus passing across the face of the Sun. Observing it from distant points lets you calculate the Earth's distance from the Sun — the official reason for Cook's 1768 voyage.
SCIENTIFIC RACISM	The nineteenth-century use of scientific apparatus — measurement, classification, publication — to manufacture racial hierarchies. Wrong, influential, and indistinguishable in form from real science of the period.
INDO-EUROPEAN	The language family linking Sanskrit, Greek, Latin and most European and North Indian languages. Identified through imperial-era scholarship in Calcutta.
INDUS VALLEY CIVILISATION	The urban culture of Harappa and Mohenjo-daro, unknown to anybody until excavation in the imperial period revealed it.

The timeline so far

Carried forward, with these two chapters added.

WHEN	WHAT
c. 1020	Ibn al-Haytham runs controlled optical experiments in Cairo.
1405–1433	Zheng He's seven voyages. Then China stops.
1492	Columbus. Three ships. He dies believing he reached Asia.
c. 1500	Blank spaces begin to appear on European maps.
1744	Webster and Wallace calculate the widows' fund. It pays out from 1765.

WHEN	WHAT
1768	Cook sails for Tahiti with astronomers and botanists, and opens the Pacific.
1798–99	Napoleon in Egypt. The Rosetta Stone.
1786	William Jones on Sanskrit, Greek and Latin.
1920s	Harappa and Mohenjo-daro emerge from the ground.
1940s	The Manhattan Project. Two billion dollars for a weapon. Part 10 starts here.

Part Ten

Chapter 16: The Capitalist Creed · Chapter 17: The Wheels of Industry

The money and the machines. Two chapters that explain more about your working week than anything else in the book.

Chapter 16 starts with a belief so strange it is hard to get back inside: that the total amount of wealth in the world is **fixed**. If your share grows, mine shrinks. In that world, credit barely exists, because nobody will lend against a future that holds no more than the present. Then, around the sixteenth century, an idea took hold — the pie can grow — and that single belief creates modern credit, which creates almost everything else. It also contains the darkest argument in the book: that the Atlantic slave trade was not a government policy but a market outcome, funded by shares, insured by underwriters, and run for dividends by respectable people who never saw a ship.

Chapter 17 reframes the Industrial Revolution as something better than factories and mills. It was a revolution in **converting energy** — heat into motion, motion into electricity — and once you can turn heat into movement, you can turn anything that burns into anything you want. Then the same industrial logic was applied to living animals, and Harari says something about that which I have not been able to put down.

Here is what Part Ten takes on:

- Why a bubble in 1720 helped bring down a monarchy seventy years later
- Why the Dutch became the financial centre of Europe through reliability rather than resources
- How a private company with its own army governed much of India for a century
- Why Britain fought two wars for the freedom to sell drugs, and called it free trade
- Why there is no energy shortage, only a conversion problem
- And why consumerism is the first religion in history whose followers actually do what they are told



End of Part Nine of Eleven · The Blank Space on the Map

My own reading of *Sapiens* — Lovepreet Singh

Sapiens: A Brief History of Humankind, Yuval Noah Harari, 2011