

Sapiens: A brief history of humankind

These are notes on the lecture series and book by Yuval Harari titled [Sapiens: A brief history of humankind](#).

Here is the course content as it appears in the lecture series (and coursera mooc):

Part I: The Cognitive Revolution

- Lecture 1: The Human Family
- Lecture 2: The Cognitive Revolution
- Lecture 3: Daily Life in the Stone Age
- Lecture 4: The Human Flood

Part II: The Agricultural Revolution

- Lecture 5: History's Biggest Fraud
- Lecture 6: Building Pyramids
- Lecture 7: There is No Justice in History

Part III: The Unification of Humankind

- Lecture 8: The Direction of History
- Lecture 9: Imperial Visions
- Lecture 10: The Law of Religion

Part IV. The Scientific Revolution

- Lecture 11: The Discovery of Ignorance
- Lecture 12: The Marriage of Science and Empire
- Lecture 13: The Capitalist Creed
- Lecture 14: The Industrial Revolution
- Lecture 15: A Permanent Revolution
- Lecture 16: And They Lived Happily Ever After
- Lecture 17: The End of Homo Sapiens

and for comparison, here is the contents page of the book =>

So, there is an extra chapter under part two (agricultural revolution) and two extra chapters under part three (unification of humankind).

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Here are some brief notes from the lectures. Key concepts or ideas will be highlighted in red.

Lecture 1: The Human Family

Lesson 1 - part 1 - introduction to the course

Lesson 1 - part 2 (segment 1 or start of the first lecture) - outline of science from physics to history; the main historical events (cognitive, agricultural and scientific revolutions) that made us the dominant species on the planet; the scientific name of our species: (*genus*) *homo* (*species*) *sapiens* - other species in the genus *homo* include our "brothers and sisters" from neanderthals to the very tall *homo erectus* and the very small *homo floresiensis*

Lesson 1 - part 3 (segment 2) - main characteristics of the *homo* genus: **bigger brains, upright posture, use of hands to make tools**; disadvantages: skeleton not adapted to upright position, women had to give birth to babies with big heads through a more narrow birth canal, resulting in higher maternal and infant mortality - **babies came to be born prematurely**, needing much more care from the mother and the tribe - humans can be socialised and moulded into new cultural shapes - still, humans were not dominant, surviving mainly on marrow from the carcass of the prey of large predators - the leap to the top of the food chain happened only about 100,000 years ago, and we were not adapted to this, we were like armed sheep

Lesson 1 - part 4 (segment 3) - **domestication of fire**, probably by neanderthals some 300,000 years ago, brought great advantages and especially power beyond our physical bodily capacities, foreshadowing the atomic bomb

Lesson 1 - part 5 (segment 4) - evolution of *homo sapiens* by around 150,000 years ago - disappearance of all other human species - possibly caused by **interbreeding**, possibly by **replacement** (even genocide) - political implications of which theory is correct - in 2010, neanderthal genome mapped, showing that we share about 4% of their dna; similar with other species - about 50,000 years ago we finally split from the other species - so why did neanderthals become extinct? - possibly due to competition, possibly due to violence and intolerance - how would the world look today if there were still other human species? would neanderthals be seen as having a soul and "human rights"? - how exactly did we achieve this eventual dominance as the sole remaining human species?

Lecture 2: The Cognitive Revolution

Lesson 02 - part 1 - so far, the nearest thing to a definition of "cognition", @16:30, Harari says that the main cognitive abilities are "communicate, remember, learn, think". @22:17 - "history begins with the cognitive revolution".

Harari does clearly acknowledge language in other animals but this lesson ends with the question: "what is so special about our language?"

Lesson 02 - part 2

The focus is on language, what is special about human language?

First, we can share a lot more information, using broken down elements or words [and grammar?].

Second, language allows us to *gossip* which aids social cooperation. We mostly gossip about other people, describing their faults and failings.

Lesson 02 - part 3

The truly remarkable feature of our language is our ability to speak about things that don't exist. It is a *fictive language*. We believe myths, legends, fairy stories. This fictive language allows us to cooperate in large numbers in a flexible way.

Lesson 02 - part 4

Peugeot company with its lion-man symbol is used as an example of a modern-day fictional "reality" .. it is a "limited liability company" .. a very convenient fiction ..

@13:45, like a shaman, Peugeot "told a story and convinced everyone to believe in the story" .. [but is not Harari himself telling us a story?]

comparison with story told by Catholic priests .. origin of "hocus pocus" ..

it is like the ritual of legal incorporation of a new company ..

question: "how to convince millions of people to believe in the same story?"

fiction = imagined reality = social constructs

not the same as lying, it is created and believed in, in all sincerity

dual reality: objective reality of rivers and trees and lions; imagined reality of nations and gods and money

another important advantage which we will discuss in the next segment ..

Lesson 02 - part 5

our stories allow for very fast cultural evolution, eg French revolution

no longer any need for dna or environmental change to produce social change

it is the stories that are passed from one generation to the next

changing the stories produces change in behaviour and in social structure

sapiens' versatility and innovation gave it the edge over neanderthals

summing up advantages of cognitive revolution:

- 1) larger quantities of information could be shared
- 2) gossip enabled greater cooperation
- 3) fictive language allowed cooperation among much larger numbers of people and allowed for *fast social change*

from the cognitive revolution onwards, biology is not enough to explain human behaviour from that point on, we need history to understand ourselves, we need to look at our cultural changes, we need to look at our stories and ideas and fictive realities

the next lesson looks at what life was like in the stone age

Lecture 3: Daily Life in the Stone Age

Lesson 03 - part 1

evolutionary psychology - not only the body, but also the mind is shaped by evolutionary pressures

eg, the way we eat today is shaped by the way we ate 50,000 years ago

more controversial is our family relationships

monogamous families may not have been the norm

eg, *collective fatherhood may have prevailed*

if so, then a lot of our modern-day traumas (divorce, infidelity, etc) are a result of our programming being at odds with our current expectations

other theorists believe we were monogamous back in the stone age

we have insufficient evidence to decide who is right

studying Australian aborigines and Kalahari desert people can help but these might not be representative of all hunter-gatherer societies

the cognitive revolution introduced diversity in cultural norms

but there were probably some shared characteristics

Lesson 03 - part 2

stone age groups consisted mostly of humans, that is, *no domesticated animals*

by about 15,000 years ago, however, dogs had become part of the human bands

dogs helped with hunting but most importantly as an alarm system against enemies

members of a band knew each other very well

neighbouring bands could be friendly or hostile, they could trade or cooperate

bands were not settled but moved according to seasonal variations

some humans, living near the sea or large rivers, did set up permanent villages

food was very varied and gathered food provided most of the calories

ancient foragers had well developed physical and mental abilities

they knew a lot about their immediate natural environment

they had to be self-reliant: unlike us they could not rely on experts who are strangers

today, we have much greater collective knowledge but much less individual knowledge

there is evidence that our brain size has reduced since the stone age

hunter-gatherers also had a better life, working less hours than most people do today
their food was very varied and nutritious and they were very healthy
they suffered much less from famine and plagues
some researchers see these stone age people as the original affluent society
however, life was still harsh in many ways, eg, high infant mortality, high trauma fatality, high violence
positive aspects were emphasised to counter **the prejudice of progress** through history
it is only the elite who benefitted from this “progress”
next lesson will look at religion, politics and violence in the ancient world

Lesson 03 - part 3

a look at the mental and spiritual life of the stone age
animistic beliefs were probably common: everything in the world has an awareness and personality like ourselves and, in addition, there are immaterial spirits
we can communicate with the wolves, the clouds, the rocks, etc
the spirits are particular and local, not transcendental
animism may have been expressed through great diversity
difficulty in interpreting ancient cave paintings and statues
the cave of the hands is moving but can tell us nothing about the beliefs of the people who made this
we may have to accept that we know little about this aspect of the stone age

Lesson 03 - part 4

a look at politics and warfare in the stone age
discussion of burial sites containing elaborate jewellery and grave goods
suggest hierarchy and social inequality
two schools of thought on war: ancients were **either peaceful or very violent**
evidence either way is poor and problematic
there was probably diversity in this respect as well
new research techniques are emerging, such as dna studies
but still, **we know almost nothing about our early history**

related links:

[Early men and women were equal, say scientists](#)

Lecture 4: The Human Flood

Lesson 04 - part 1

this lesson looks at how sapiens related to other animal species

first, there were separate geographic ecosystems but then sapiens reached them all and connected them (we don't know how they did this)

not only did sapiens reach these new areas but it quickly adapted to the new environment

not through a slow transformation of genes but through new technology

they also began to transform the local (australian) ecosystem

most of all, by (apparently) **wiping out almost all of the giant species**

as well as many other smaller species

how did they do it?

1 - slow breeding among large animals

2 - surprise element among animals not used to sapiens

3 - fire agriculture used to reshape environment

climate change also played a significant role exacerbating the danger of the human invasion

Lesson 04 - part 2

second ecological disaster was in america

sapiens followed game across the bering straight

as they went southwards they adapted to a large variety of habitats

they left behind a long trail of victims, especially large animals

the same tragedy happened on a smaller scale later when new islands were reached

eg, the large island of madagascar shows this extinction process once sapiens arrives

today we have the third wave of extinction brought about by industrialization

we are the true flood and we only take into the ark the animals that we exploit

Lecture 5: History's Biggest Fraud

Lesson 05 - part 1

why did the agricultural revolution happen?

about 12,000 yrs ago, we began to manipulate the lives of wheat, sheep, etc

this happened not only in the middle east but in other areas as well

very few plants and animals were good candidates for domestication

jared diamond: guns, germs, and steel

this book gives a more detailed description

agriculture brought more food but it didn't improve the lives of ordinary people

this is why it is the biggest fraud in history

it was wheat, rice, potato that domesticated humans

our bodies were not adapted to this back-breaking work

“domesticate” = make to live in a house (comus)

Lesson 05 - part 2

wheat did not bring a better diet or economic security

human violence increased

wheat did not offer anything to individuals but it did offer something to our species

agriculture allowed homo sapiens population to grow

evolution measures success by the number of copies of the dna of a species

it doesn't matter if the individuals are unhappy

wheat keeps many more people alive under worse conditions

there was no conscious decision to adopt agriculture but a gradual transition

women had more babies because there was more food and more need for labourers

infectious disease increased due to unhygienic conditions and poor diet

life became more and more burdensome

why did people make such a fateful calculation?

Lesson 05 - part 3

the plan: if you work harder, life will be better

but the longer term dangers were not foreseen

similar story with college student today who sets aside a dream and decides to work hard

he becomes trapped with new obligations like family and mortgage

law of history: luxuries become necessities

example of emails which place new demands on us

lesson for humanity: search for easier life triggers changes that can no longer be controlled or reversed

this happened again and again throughout history

it is very difficult to foresee the future and the full consequences of our decisions

alternative explanation: desire to fulfill religious or cultural aspiration or ideal

Gobekli Tepe site - monumental structures made by hunter-gatherers

hints at a religion or ideology that motivated the pre-agricultural people

seems to be associated with the initial cultivation of wheat

the extra food was needed to feed the labourers building these monuments

perhaps temples come before villages, and not vice versa

in some places at least, cultural factors drove the change

Lesson 05 - part 4

what was the role of animals in the agricultural revolution?

process began with selective hunting, preferring submissive animals

domestic animals are widespread now, so successful in evolutionary terms

but like us, they are not happy in individual terms

most are slaughtered at quite a young age

the remainder are effectively enslaved, males usually castrated

example of mutilation of pigs to keep them dependent

milk extraction has much cruelty attached

Lecture 6: Building Pyramids

Lesson 06 - part 1

despite more food, conflict increased

example of Israel where there is plenty of food but no end to conflict

we have **no natural instincts for cooperation on large scale**

instead, **we had to invent stories** about tribal ancestors and gods

empires eventually ruled tens of millions of people

they relied on an **“imagined order”** based on shared stories

two major examples given: code of **hamurabi**, **US declaration** of independence

the first established **hierarchy**, the second **equality**

both promised a **stable and prosperous society**

justice only exists in human imagination, it has no objective reality

Christian origin of idea of equality via ideas of divine creation and soul

he translates the US declaration into biological terms, no longer so lofty!

Lesson 06 - part 2

large complex societies are based on imagined realities

the social order needs to be conserved, partly by violence, partly by persuasion

true believers are a necessary part of the social order

how to create such true believers?

we do it via education, propaganda, advertising, storytelling, the arts

the stories are woven into every part of life

1 - the stories **shape our material world**, for example, individualism leads to architecture

providing private space for each member of the family; medieval values led to communal living, even for princes

2 - the imaginary order **shapes our desires**, eg, our current desire to travel, we are programmed by “romantic consumerism”: we need new experiences and we need to buy stuff, so tourism is big business

3 - the order **effects everyone**, it is an intersubjective order

difference between **objective, subjective, and intersubjective truth**:

radioactivity is something objective

an imaginary friend is subjective (individual fantasy)

gods, nations, human rights, money, corporations are inter-subjective entities

any one of them can only be changed by reference to a more powerful imagined order

we simply move to a larger exercise yard within the same prison

Lesson 06 - part 3

third necessary ingredient besides enough food and a stable imagined order:

technique for storing information, beyond human brain

not only larger amounts of information but especially new information

especially monotonous mathematical data or **numbers**

human brain not adapted to processing large amounts of numbers

eg, empires need tax data and accounting data

sumerians were the first to solve this problem by inventing data processing outside the human

brain: **writing**

writing was first used to record numbers

it is still true today: the dominant language today is numbers

physics and engineering are almost wholly communicated through mathematical symbols

binary numbers are used to communicate via computers

Lesson 7: No Justice in History

Lesson 07 - part 1

impact of new mass cooperation on people

hierarchies and castes developed

these are believed to be natural or eternal divisions

today we can see no real distinctions, it is all imagined

however these imagined rankings are needed because we mostly encounter strangers and need some signals for how to relate

developing one's potential is easier for the higher castes, eg the rich

different societies use different hierarchies

Lesson 07 - part 2

accidents of history determine specific castes, eg, conquerors take on higher castes and relegate conquered to lower castes, such as originated the Indian caste system

the notion of purity and impurity is used to justify social distinction

this exploits a biological mechanism of avoiding dangerous (impure) things like corpses or decaying food or poison

modern America used slaves from Africa for accidental reasons: geographic, existing slave trade, immunity to tropical diseases

resulted in ruling class of white Europeans, subjugated class of African slaves

invented stories used to justify this inequality

these continued to influence society even after slavery abolished

blacks continued to be seen as a source of pollution

this is one reason why it is good to study history because it helps explain these phenomena

Lesson 07 - part 3

discrimination against women, in almost all known societies

women considered to be the property of men

a husband could not rape his wife, even today in half the countries of the world

are there biological justifications for this?

most of the reasons given for discrimination are seen as nonsense today

similar views regarding male homosexuality

most of what we view as "natural" and "unnatural" are only invented

rule of thumb: biology enables, culture forbids

behaviour that goes against the law of nature simply cannot exist

eg men cannot photosynthesize, women cannot run faster than the speed of light
the theological notion of “natural” is “something that accords with God’s intentions”
while the process of evolution has no purpose or intention
sex=biological (objective) category=male/female
gender=cultural (intersubjective) category=man/woman=mascularity/femininity
only a “real man” acquires the full privileged status of males over females
patriarchal society values masculine qualities
almost all known human societies have been patriarchal, at least since the agricultural revolution
this is not an accidental phenomenon as with the caste system
this suggests that there is a universal biological reason behind this
several theories are available but none of them really answers the question

Lesson 07 - part 4

review of these universal biological reasons and theories, and their problems

1 - men are **physically stronger** than women

not precisely true anyway + association of strength with political power not strong
eg higher status associated with lesser use of physical strength

2 - men are **more aggressive** than women

men => war => civil power => more war ... closing vicious circle

generals, politicians need not be men .. this doesn't follow

in fact, higher status men become the generals, lower status men the common soldiers

so why not higher status women in these management or leadership roles?

only very rarely were women able to obtain top positions

3 - men **more competitive and ambitious**, women needed help from man, became submissive
and dedicated care-givers of children and husband

elephants and bonobos form matriarchal societies - why are we not like this?

this question of male superiority is one of the great unsolved riddles of history

Lecture 8: The Direction of History

Lesson 08 - part 1

interaction of different societies with different imagined orders

question of overall pattern and whether there is a direction in history

yes, there is a **clear general direction toward global unity**

10,000 BC - thousands of separate human worlds

2,000 BC - perhaps hundreds

1491 CE - Afro-Asia (90%) already united; meso-American, Andean, Australian, Oceanic worlds (remaining 10%)

today - all people are interconnected, no longer living in separate worlds

same basic political ideas (nationhood, democracy) prevail

economic structures similar everywhere, \$1 bill can buy something anywhere

science and medicine the same everywhere

global influence is present everywhere

example of ethnic food such as spaghetti with tomato sauce, chocolate, potatoes in Europe;

chilis in India, steak in Argentina

globalization process began thousands of years ago, it was only completed in recent centuries

vision of united humanity began very early, it goes against biological interests

“us” and “them” prevailed despite unification

1st millennium BC, things changed: **3 potentially universal orders began**

1 - **economic** order, based on money

2 - **political**, imperial order

3 - **religious** order, such as Buddhism, Christianity and Islam

***everyone* uses money, it is the most fundamental basis for unification**

Lesson 08 - part 2

how did money succeed where no king or god could?

pre-agricultural communities shared goods and services based on personal relationships

with strangers, a simple barter system was used

the rise of cities and improved transport led to specialization, eg shoemaker

peasants also specialized in products suited to their geography, eg olive oil

problems arose with exchange of goods and services

barter cannot form the basis of complex economies due to complex exchange rates, each side must want what the other offers

solution: money as an imagined entity

money is not coin or banknotes, but an inter-subjective belief in the value of tokens such as cowrie shells or cigarettes

today, 90% of money exists only on computers as electronic data

everybody wants money, so it can be exchanged for any goods or services

money is a universal medium of exchange that allows people to convert one thing to another also allows storage and transport of wealth

Lesson 08 - part 3

how does money work? trust is the foundation

“In God We Trust”: Both God and the US Treasurer assure us of the worth of \$1 bill
early barley money could be eaten but its value was based on trust
the breakthrough came when money was something useless, that could not even be eaten
coins were marked with ruler’s sign, trust in the ruler led to trust in the money

we trust the US \$1 because we trust the US government

“denarius” - the coin of the Roman empire - became the general word for money

gold and silver became the standard money all over the world

this lay the foundation for a global transnational economic sphere

economists agree that once two areas are connected, the supply and demand leads to established value for money

money doesn’t ask us to believe in anything particular, only that others believe in it

money is the apogee of human tolerance

it can bridge all cultural and religious gaps

1 - universal convertibility

2 - universal trust

however, money does need the support of a political and a religious system

Lecture 9: Imperial Visions

Lesson 09 - part 1

what is an empire? a political order

1 - rule over many different peoples

2 - flexible borders, unlimited appetite

empires have various political orders, not just emperors

empires can be large or small

in the past, there were many more peoples with smaller populations

this diversity was replaced by larger groups conforming to dominant culture

today, empires are seen as not working, and as evil

history shows this to be nonsense and questionable

until recently, middle east was dominated by empires, one after the other

empires do collapse but are replaced by other empires

empire toolkit includes war, slavery, genocide but there are also positive aspects such as building culture: philosophy, the arts and sciences, etc

language, especially, has been formed by empire

Lesson 09 - part 2

beginnings of empire

1st known empire: 2200BC, Sargon of Akkadian empire around mesopotamia

short-lived but left dream to conquer the world

500BC - Cyrus, bigger ambition of being king of all humans

this goes against the instinctual trend to “we” vs “they”

ethnic exclusivity to be replaced by inclusivity

empire like parents (elite) caring for children (conquered)
adopted by later empires as justification
a particular culture is promoted as the superior culture
the spread of this culture is to the benefit of all
eg, US today is spreading democracy and human rights
example of Roman legacy in Spain, 1500 yrs after the empire's collapse
Islamic empire: adoption of religion and Arab language led to breakdown of original hierarchy;
the culture, religion, language continues despite collapse of empire
similar pattern in China: 90% of population see themselves as Han people
European culture now spreading throughout the world, its principles used by independent states
as justification for their own self-determination
we are left with **dilemma over moral value of empires**

Lesson 09 - part 3

example of modern India with its **legacy** from British **imperial rule**
no solution to issue of cultural authenticity
Cyrus' vision is likely to be fulfilled in our lifetime
today, nationalism is losing ground, we need a global empire
the colour will be green (for environmental movement)
[but this is also the colour of Islam!]
global world being run by global elite (managers, journalists, lawyers, professors)
today, main divisions are not national but horizontal classes or castes
divided loyalty between nation and global community
finally, religion is the other force in uniting the world

Lecture 10: The Law of Religion

Lesson 10 - part 1

religion seen today as divisive but it had a vital role in uniting people
it gave superhuman legitimacy to fragile imaginary order
this ensured social stability
2 criteria for a religion:
- **superhuman order** not subject to human whim
- **derived norms and values** that are binding
ancient religions were local and exclusive, no ambition to convert entire human race
universal religions emerged 2500 years ago (Buddhism, Xianity, Islam)
animism - other beings in the world, eg trees and rocks and fairies
polytheism - world governed by many gods
inner logic of polytheism:
there is often a single principle that controls all the different gods
eg, fate, moira, ananke ruled over Zeus and other Greek gods
in Hindu polytheism, there is Atman
but supreme power is indifferent to human concerns
so, no temples built to fate or Atman

it is the partial and biased powers that must be approached for mundane concerns
polytheists are open-minded and tolerant of other gods and goddesses
polytheist empires did not force subject people to convert to their religion
Roman empire did not tolerate the Christians, not because of their own beliefs but because they refused to worship the Roman gods emperor
religious violence and intolerance became much more prevalent among monotheist Christians

Lesson 10 - part 2

birth of **monotheistic religion**: supreme principle does care and equals one of the preferred gods as the one and only god

Akhnaten first monotheist, but it didn't last

Judaism specific to Jewish people and small state of Israel

big breakthrough came with **Christianity, Paul opened up religion to all humans**

Islam also began as a small sect but quickly conquered an immense empire

monotheists feel obliged to discredit all other religions

Xianity replaced multiple gods with multiple saints

dualistic religions: good vs evil

solution to problem of evil, a major problem for monotheists

main intellectual trick: free will needs both good and evil, not satisfactory either

monotheists do adopt a form of dualism, through the idea of Satan

drawback of dualism: problem of order that governs the rules of the game

logical solution: evil god only .. no one wants to believe this

monotheism eventually prevailed over dualism

but it did absorb dualistic beliefs and practises, as it had done with polytheism

no logic to holy war in pure monotheism, only justified through dualism

dualism also contributes the idea of heaven and hell

monotheism is actually a mish-mash of animism, polytheism, dualism

but not all religions give so much importance to God or gods

Lesson 10 - part 3

1st millenium BC, several religions arose characterised by **disregard of God/gods**

prime example is **Buddhism**, a major faith of the world today

to Gautama, life seemed like a hopeless rat race

suffering is caused by the mind itself, which craves for something different

the mind can be trained to stop such craving

nirvana=extinguishing the fire of craving

buddha=enlightened one

gods still acknowledged

99% of Buddhists don't achieve nirvana

[traditional] natural law religions have this in common: **gods are still influential**

once free from gods, these became extremely important in the modern world

new natural law religions have arisen, now called ideologies

eg liberalism, communism, capitalism, nationalism, nazism

these are essentially religions, even if they don't rely on God/gods

whether called religions or ideologies, they function as religions have done

most important ideologies are humanist, they dominate the world today

Lesson 10 - part 4

discussion of humanist “religions” that worship homo sapiens

3 main rival sects, with different definitions of “humanity”:

1 - **liberal humanism** - sanctifies liberty of individuals

commandments are known as “human rights”

it is a direct legacy of Xian belief in individual soul

2 - **socialism** - humanity is collective, not individualistic

it is also founded on monotheistic beliefs

all humans are equal = all souls are equal before God

3 - **evolutionary humanism** - eg Nazis

main ambition to protect humankind from degeneration and extinction

Aryan race had the finest qualities, that could turn men into supermen

belief in the superiority of the white race was prevalent throughout the western world

liberal and socialist humanism went against the natural laws of evolution

all of these forms of humanism have come under scrutiny with recent advances in science

Lecture 11: The Discovery of Ignorance

Lesson 11 - part 1

our world today would be completely strange to someone from 500 years ago

much that we take for granted would seem really weird

science, politics, and economics influence each other

modern science differs from previous cultural traditions in 3 ways:

1 - **admitting ignorance**

2 - centrality of **observation and mathematics**

3 - aims to acquire new **powers (not truth)**

Lesson 11 - part 2

science relies on empirical observations held together by **mathematics**

religion used stories to build its theories [so does history?]

Newton’s Principia used simple mathematical laws and no stories

psychologists use statistics

mathematics is taught as foundational to all of the “exact” sciences

science is understood by very few people but it enjoys **enormous prestige due to power**

science and technology combined in the last 200 years

“research and development” is a very recent notion

Lesson 11 - part 3

with science, progress seemed possible

example of Benjamin Franklin and **lightening**

today, most of the population has a safety net against **poverty** and starvation

biggest problem is **death**, which is central to religion

epic of Gilgamesh - quest for immortality ends in failure

modern science doesn't accept defeatist attitude - death is only a technical problem
big project is to defeat both death and old age
to be a-mortal (not immortal) is foreseeable by 2050 at least for rich people
life expectancy doubled (or tripled) in last 100 years
mainly through decrease in infant mortality
example of 13th century children of queen eleanor, 10/16=60% died in infancy
from 18th century new ideologies began to see death as a technical problem and the belief in life after death declined
nationalism - people live on in the minds or memory of nation
many people believe science will solve all our problems and result in heaven in this life

Lesson 11 - part 4

science is governed by politics, economics and ideology because it is expensive
science receives funding where it seems useful or profitable
eg US and USSR spent a lot on development of nuclear weapons
individual scientists may act from intellectual curiosity
but the agenda is set based on issues of ethics and relative values,
which are the domain of ideology, politics, and economics
ideology also determines what will be done with scientific discoveries
two forces are especially important:
1 - European imperialism
2 - capitalism

Lecture 12: The Marriage of Science and Empire

Lesson 12 - part 1

european empire arose quite suddenly in modern times, from 1500-1750
1750-1850 european powers conquered other powers and became a dominant economy
today, all humans are european in their thought, their taste, their worldview
despite anti-western rhetoric, this is the case
technology was important from 1850 onwards
but still, non-western countries lagged behind in adopting new technology like trains
what China, Persia, Turkey lacked was the cultural structure underlying this
european empire had the potential for development: why?
two complementary answers: modern science and capitalism
europe no longer rules the world but science and capital do

Lesson 12 - part 2

how are science and empire connected?
nothing like Newton or Darwin happened in the non-West
conquerors and scientists shared admission of ignorance
early European voyages were both voyages of conquest and of discovery of new knowledge
conquest of territory and of knowledge became intertwined

example of James Cook expedition which took scientists with it but also claimed sovereignty over pacific islands and lands the fertile lands of australia and new zealand were taken over for the inhabitants this was a catastrophe, they were decimated another famous expedition was the Beagle which carried Darwin 1969 moon landing story about secret message to moon spirits
exploring and conquering went together

Lesson 12 - part 3

explore and conquer mentality in the west

example of **world maps with empty spaces**

“America” named after Amerigo Vespucci who “truly” discovered the new continents

earlier empires did not try to conquer unknown lands

exception might be exploratory expeditions of Zheng He in 15th century China

but this did not have any intention to conquer and it was a one-off event

Europe was not technologically advanced but it did have the **ambition to explore and conquer the world**

China, India, Islamic world did know about the new discoveries but they didn't try to compete,

non-european powers simply lacked the ambition to do this

for 300 years, Europe gained the resources of America and grew more and more powerful so that it was able to conquer the Asian/African powers themselves

Lesson 12 - part 4

empire began by supporting geographical research but extended to other sciences because they proved to be useful, eg, quinine from botany

when British conquered India they brought various scientists

eg, Indus valley civilisation discovered, Egyptian hieroglyphs deciphered

what we know today owes much to the European empire

the scientific projects also gave the empire justification and legitimacy

the superiority of the white races justified the conquest of other races

they brought the light of reason and science to the dark areas of the world

they also brought famine as in Bengal and much racist injustice

the legacy of the European empires is complicated, neither good nor bad

science was largely supported by the Empire

but it was capitalism that financed both

Lecture 13: The Capitalist Creed

Lesson 13 - part 1

modern capitalist economy: key word is ***growth***
annual per capita production: 1500 - \$550 ... 2013 - \$8800 [16 times as much]
today, banks can loan \$10 for every \$1 that is actually in the bank
it seems like a fraud but it has been working now for hundreds of years
it is based on our ***trust* in the future** when the loan can be repaid
in the middle ages, it was hard to start or expand a business
but now we can use ***credit*** to get started in business
we build the present at the expense of the future
this has to be **tied to a belief in progress** and economic growth
many people today still think that the economic pie is static:
we can only enrich ourselves at the expense of other people
in the pre-modern world economic stagnation was a self-fulfilling prophecy
how did this vicious circle break?

Lesson 13 - part 2

scientific revolution brought idea of progress
translated into economic terms as ready credit
1776, Adam Smith published Wealth of Nations: individual profit brings collective wealth
greed is good, becoming richer benefits everyone else
Smith denied the traditional morality as expressed by Jesus in the Bible
new morality: profit should be reinvested in production, and so on ..
difference between capital (productive) and wealth (useless, like buried treasure)
new capitalist elite are managers, industrialists
they wear plain suits and rush from one business meeting to the next
they don't dress flamboyantly like the pre-modern elite
wondering where to invest one's money is thinking along capitalist lines
capitalism is now a kind of religion
investment in science is based on promise of economic growth
2008 crisis is eroding our trust but we are hoping and relying on continuing technological
innovation to fuel growth

Lesson 13 - part 3

complex relationship between capitalism and empire
European conquest was financed by credit, not by tax
early modern period saw the rise of the limited liability company
england, france, netherlands were small countries but they built huge empires
example of conquest of Indonesia by the private company VOC
British East India Company ruled the Indian state for a century
but then the capitalists gradually took control of governments
Marx: European governments were the trade unions of the capitalists
eg, opium war between Britain and China
credit rating is now more important than natural resources
main issue today is how to manage this relation between politics and economics

doctrine of free market is main element of capitalist creed

there are problems with this when taken to extreme

Lesson 13 - part 4

free market doctrine is as naive as belief in santa claus

trust in market is critical and government regulation is needed to maintain trust

greedy bosses might use their power to turn their workers into slaves

slave trade was managed by capitalist system

capitalism kills people out of indifference, not out of racial or religious hate

economic growth might be a fraud like the agricultural revolution

communism was so bad, no one wants to try that again

we may not like capitalism much, but we can't live without it

we don't know how else to run the world economy

prophets of doom say growth cannot continue indefinitely, we will run out of resources

Lecture 14: The Industrial Revolution

Lesson 14 - part 1

energy and raw materials growing rather than diminishing

science/technology has found solutions when shortage threatened

explosion in production is the industrial revolution

new sources discovered, new ways to harness them discovered

eg, invention of steam engine - real beginning of industrial revolution

general principle of using any energy to do any work

internal combustion engine - use of petroleum

electricity now ubiquitous

world does not lack energy, we just lack know-how to harness it

eg sun energy, we use only a tiny portion of it

what about raw materials? cheap energy allows better access to this

scientific breakthroughs also invent new raw materials

examples of aluminium and saltpetre

cheap energy and raw materials led to the explosion in productivity

Lesson 14 - part 2

biggest impact of industrial revolution was on agriculture

greater efficiency and transportability

farm animals came to be seen as food-producing machines

example of caged hens and pigs and dairy cows

this brutality is fueled by greed and indifference

evolutionary psychology reveals that these animals have complex social and emotional needs

these subjective needs are neglected by modern agriculture

Harlow experiments with baby monkeys showed importance of emotional needs

industrial agriculture ignores these emotional needs and raises ethical issues

pre-industrial agriculture was inefficient and needed a peasant class of 90% population

today, only 2% population can do the same job
people moved from the country village to the towns and cities
we now produce more products than people actually wanted
hence the **problem of consumption**

Lesson 14 - part 3

ethical revolution of **consumerism** instead of frugality
psychologists and advertisers urge us to indulge our every desire
shopping has become a favourite passtime linked to religious festivals
how to square this with capitalist creed to invest?
solution comes through division of labour:
the rich invest, the poor consume
history of ethics: wonderful ideals that could not be realized
today, people do live up to the ideals of greed and self-indulgence

Lecture 15: A Permanent Revolution

Lesson 15 - part 1

Sapiens have taken over the world and control it
ecological turmoil is a real issue and could be a danger for Sapiens itself
we are now more subject to changes from government and industry than from nature
eg, natural cycle of seasons now replaced by industrial time
our lives are driven by precise clock times

Lesson 15 - part 2

collapse of family and intimate community, replacement by state
family looked after sick and elderly, neighbours helped each other out
we now have mass welfare, health and education systems run by bureaucrats
family vendettas were a way to control violence, before the police of today
in China, local elders collected the money needed for tax
most kings and emperors provided only what the mafia provides
state and market forces began to control violence
traditional families rejected this and needed to be weakened
state and market offered people to “become individuals” and be free of family and community
the state promised to provide everything
the individual could not have appeared without the state and the market
even women and children are seen as individuals with their own rights
however, the individual is now vulnerable to state intervention
families still provide for some emotional needs
but the market now shapes and controls our romantic and sexual lives
the state especially controls relationship between parent and child
traditional respect for parents has been replaced by parents being seen as serving children
intimate communities are becoming more and more rare
nationalism and consumer tribes (eg Madonna fans, vegetarians) replace them

Lesson 15 - part 3

social structure used to be rigid but stable

modern society is flexible, dynamic, ever changing

despite this volatility, world has become more peaceful

% violent death to total deaths

2000 - war + violent crimes = 830,000 deaths -> 1.5% of total deaths

more people die from car accidents and suicide

we live today in great security from violence

annual rate of murder per 100,000 population

australia rate is 1, detroit 50, ancient farmer society 400

world average is 9 today

strong states do kill their own citizens but average is still low

since 1945, international violence has reached all time low

collapse of european empires, few wars between independent states

the collapse was massive and quick but (relatively) orderly and peaceful

Soviet collapse especially remarkable in this

Lesson 15 - part 4

since 1945, no country has conquered another

word peace has two different meaning

1) absence of war .. 2) impossibility of war

law of the jungle operated until 1945

today we have what is called "real peace"

in most parts of the world, war within a year is implausible

this may be naive but it is still a symptom of "new peace"

reasons for this:

1) price of war has gone up dramatically, especially via nuclear weapons

2) profit of war has declined, wealth has gone from material to human capital

example of California, current wealth in Silicon Valley and Hollywood

oil wealth is old-fashioned material wealth, that can be conquered

3) peace has become more profitable because foreign trade and investment are important to the economy

4) cultural change due to elite don't see war as a necessary evil

5) states losing independence, require approval of international community

we are on threshold of both heaven and hell, we don't know which

Lecture 16: And They Lived Happily Ever After

Lesson 16 - part 1

impact of scientific and earlier revolutions on **human happiness**

one view: we must be happier because we're more empowered

however: daily life of individuals worsened after agricultural revolution

spread of empires was a disaster for the indigenous peoples

diametrically opposed view: inverse correlation between power and happiness

this is the romantic view

middle road view: medieval people were more miserable but since scientific revolution we have achieved real progress

this is an oversimplification, relevant to very recent times only

and we may have been sowing the seeds of future catastrophe

we have also caused great suffering among other animals

happiness depends on more than material conditions

prosperous people can still suffer from alienation and anxiety

Lesson 16 - part 2

social, ethical, spiritual factors are also important for happiness

current definition: subjective well-being - how we feel about our life

data obtained through questionnaires

some findings to date:

happiness depends on the correlation between expectation and condition

when things improve, our expectations go up, so satisfaction may still suffer

example of daily showers and change of clothes

mass media and advertising work to increase expectation

third world people today are likely to be unhappy, not so much because of their actual living conditions but because of their exposure to better conditions elsewhere

people want to live like the people they see on tv

biologists also come to similar conclusions though by different route

evolution has made us adapted to different conditions from which we live today

pleasant bodily sensations are the key to happiness

evolution has shaped us to be neither too happy nor too miserable

we differ in our capacity for joy or sorrow

biology suggests that history has little effect on our basic happiness

eg French revolution didn't alter the basic biochemistry of French people

happy people stayed happy, miserable people were still miserable

so what was the point of such a revolution?

only event of historical significance is the advance in life sciences

we can use this knowledge to make people far happier without the need for political or social revolutions

New Age slogan: happiness begins within

happiness begins with the biochemical compounds that effect the brain

Huxley's Brave New World already envisioned this scenario

everyone in this world is happy because their happiness is controlled through biochemistry

many people find this vision to be very troubling, even monstrous to most readers .. why?

Lesson 16 - part 3

Daniel Kahneman research - women found more joy at work than in dealing with their children, yet their children were their greatest source of happiness

two schools of thought:

- 1) these women don't know what's really good for them
- 2) happiness is something different from pleasure

our values are what makes the difference

a meaningful life is not necessarily the most comfortable or pleasurable

perhaps people are happier when their lives are meaningful

early 20th century science: no purpose, no meaning to life

all these religious meanings are delusions

humanist, capitalist, etc, ideologies are the same, they are all delusions

this implies that happiness depends on self-delusion

third alternative? Buddhism offers this:

given that suffering exists, how do I escape this?

feelings are just fleeting vibrations in my brain

why struggle so hard to achieve something that disappears so soon?

meditation aims at eliminating or controlling our craving for pleasure

resulting serenity is so profound that it is hard for most people to imagine

it is a major lacuna or "hole" in the study of history that we don't know how all of the major changes have effected or impacted on individual human happiness

Lecture 17: The End of Homo Sapiens

Lesson 17 - part 1

what is the future of homo sapiens?

our species will disappear as a result of an upgrade to a new species

the next revolution will change our bodies and our minds

three methods of change:

- 1) biological engineering
- 2) cyborg engineering
- 3) engineering inorganic life

1) biological engineering- this is ancient, eg castration

however we now have far greater power over this process

eg we can now change a man into a woman

we can create hybrid structures, especially at the genetic level

genetic engineering already used in other animals, not yet humans

no technical reasons to prevent major genetic changes in humans

the main obstacles are ethical and political objections

what is at stake is too important: long life, better physical and emotional health

the technical tide cannot be held back for long

Lesson 17 - part 2

2) cyborg engineering

natural organs supplemented by inorganic devices such as spectacles
bionic ear connects directly to the brain
bionic arms operated from thought alone
they can even be operated from a distance
we may be able to read the thoughts in people's minds
most revolutionary is 2-way connection between computer and brain
our minds could become collective
difficult to grasp the psychological, social, political, ethical, etc, implications

3) non-organic engineering

independently learning programs can evolve beyond original program
example is today's evolving computer viruses based on random mutations
are these "creatures" really "alive"?
blue brain project hopes to replicate the human brain inside a computer

Lesson 17 - part 3

psychological, social, political, ethical, etc, implications of upgrading homo sapiens
in 2013, we are already in the midst of a major revolution
privacy issue: dna mapping becoming faster and cheaper
this could be used in preventative medicine but could affect insurance policies, etc
gilgamesh and super-human projects raise issues of fairness
will a super-human elite emerge that can access these advantages?
the pretensions of the upper class might become an objective reality
the potential of future technology will change us, not just our environment
what really awaits us in the future is **"The Singularity"**
using our current cognitive abilities, we cannot comprehend what this would be like
most sapiens find this troubling and disconcerting
our place in the universe will be taken by alien life forms which will view us as we view neanderthals
this is all speculative at this point, it may not turn out like that
this lesson should be a stimulant for the imagination, not a prediction
the most important question we can ask today:
what do we want to become? - this is human enhancement question
bioethics usually asks instead "what is forbidden to do?"
but it is naive to imagine that we can just hit the brakes
we cannot stop the march of science and technology
at best, we can influence the direction
much more important question is: what do we want to want?
reminder that this course is not "the truth", just one story
better to take the course as an invitation to study history further
he hopes we leave the course more uneasy than when we started it