

THE WORLD BRAIN REVISITED/ PROBLEMS AND SOLUTIONS FOR 21st CENTURY

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THE VIEW FROM MT. OLYMPUS
A little recapitulation



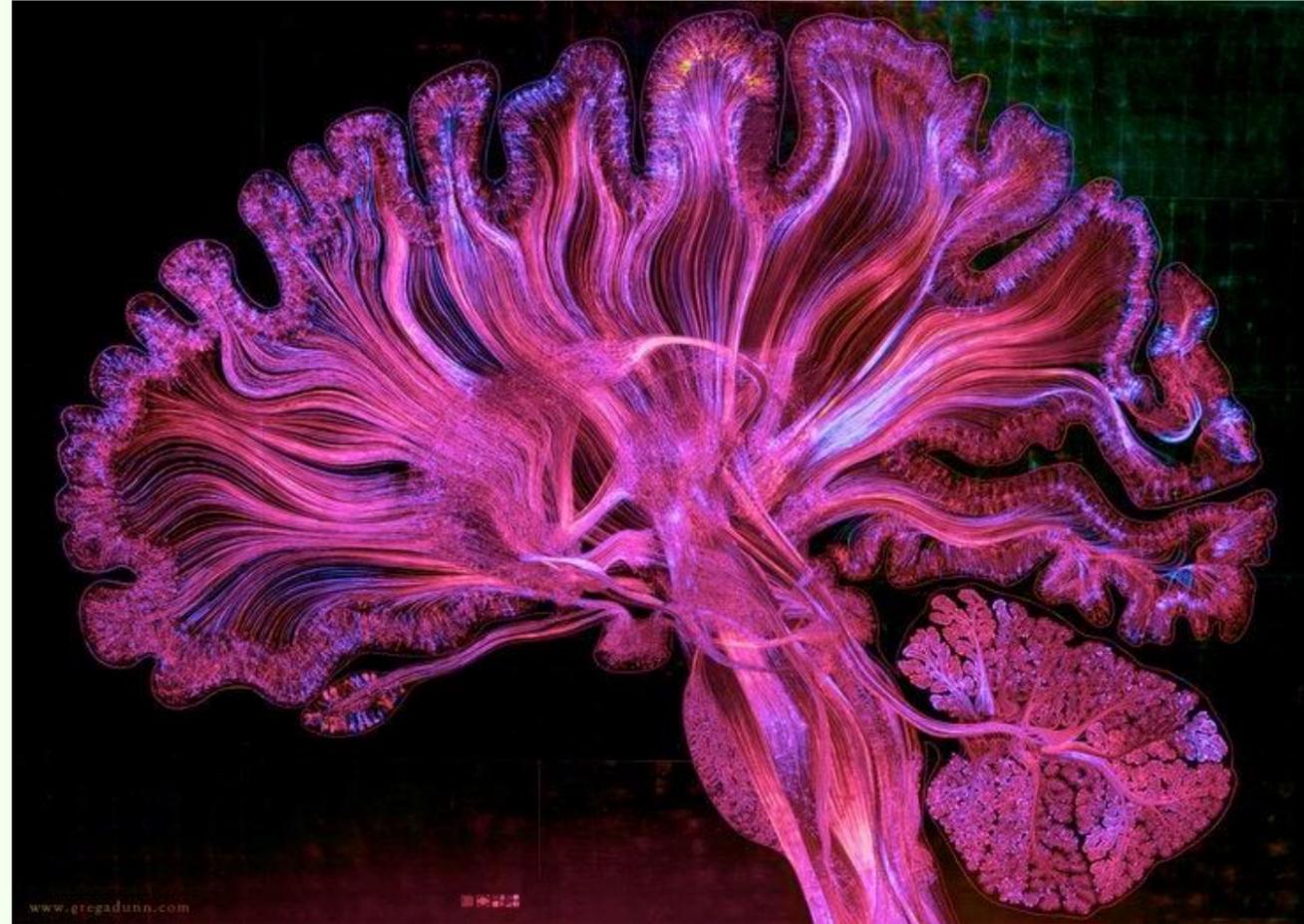
A long journey from the Big Bang to
the Homo Sapiens Brain
and then to the World Brain
and then to the human condition



OUTLINE

- I. Homo Sapiens brain evolution
- II. The advent of the World Brain
(and its surprising recapitulation of the Homo Sapiens brain development)
- III. Diseases that afflict the World Brain
- IV. Etiology of these diseases
- V. Pathogenesis of these diseases
- VI. Cure of these diseases
- VII. Markers of cure success
- VIII. New dangers and possibilities
- IX. Conclusion

IN THE PROCESS OF COMPARISON



The Human Brain



The World Brain

IN THE PROCESS OF COMPARISON



Red checkmark will indicate differences between the world brain and the human brain



Green checkmark will indicate similarities between the world brain and the human brain



I

Homo Sapiens brain evolution

BIG BANG

13.7 Billion Years Ago



Second law of thermodynamics

“total entropy of an isolated system can only increase over time”

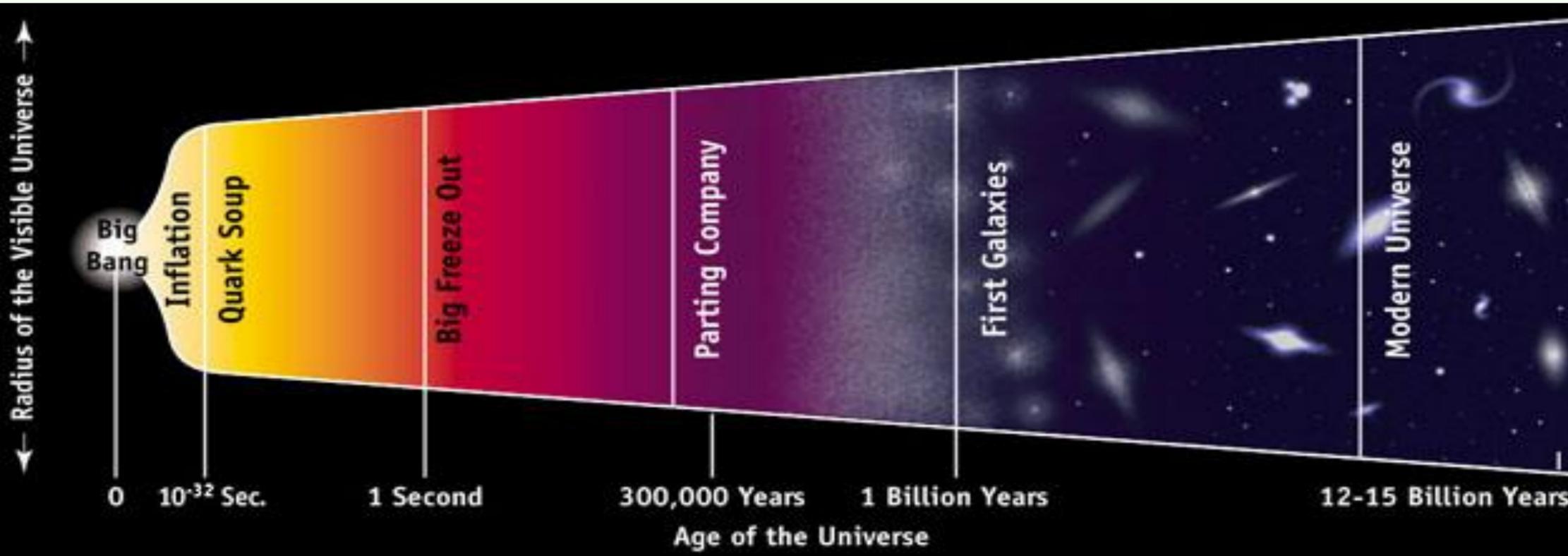


Sadi Carnot
1796 – 1832

Universal Laws in Physics and Constants

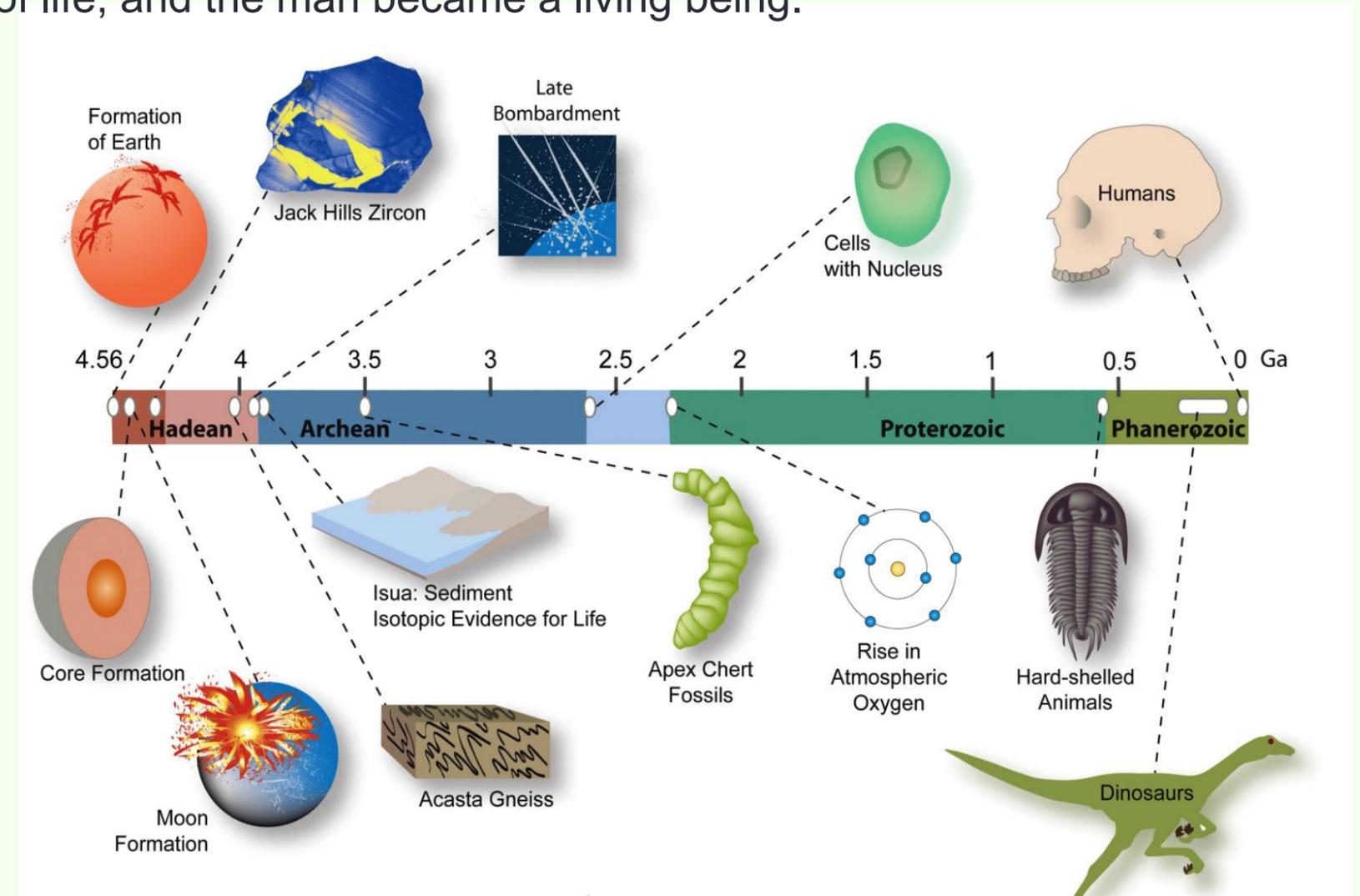
Hubble's Law of Cosmic Expansion	Velocity = $H_0 \times \text{distance}$
Universal Law of Gravitation	$F = G \times [(m_1 m_2) / r^2]$
Newton's Laws of Motion	$F = m \times a$
Laws of Thermodynamics:	<ol style="list-style-type: none"> 1. $U = Q + W$ 2. $S > 0$ 3. $S = 0$ when $T = 0$
Archimedes' Buoyancy Principle	$\rho = (W_a - W_f) / g v$
Theory of General Relativity	$E = mc^2$
Heisenberg's Uncertainty Principle	Δx & Δp is greater than or equal to $h/2$
Relativity Laws	
Relativity of simultaneity	$\Delta t' = \gamma \left(\Delta t - \frac{v \Delta x}{c^2} \right)$
Time dilation	$\Delta t' = \gamma \Delta t$ for events satisfying $\Delta x = 0$.
Length contraction	$\Delta x' = \frac{\Delta x}{\gamma}$ for events satisfying $\Delta t' = 0$.
Speed of light in vacuum	$299\,792\,458 \text{ m}\cdot\text{s}^{-1}$
Newtonian constant of gravitation	$6.67384(80) \times 10^{-11} \text{ m}^3 \cdot \text{kg}^{-1} \cdot \text{s}^{-2}$
Planck constant	$6.626\,069\,57(29) \times 10^{-34} \text{ J}\cdot\text{s}$
Reduced Planck constant	$1.054\,571\,726(47) \times 10^{-34} \text{ J}\cdot\text{s}$

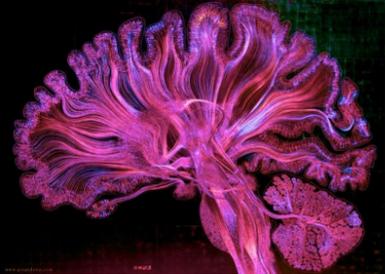
Evolution of Energy into Matter



Matter into Life

“Then the Lord God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.”

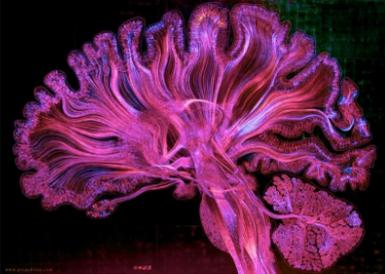




Neuronal Tissue Out of Matter

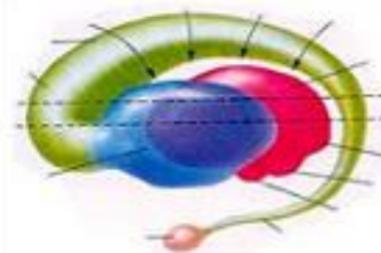


Jellyfish - 580 million years ago

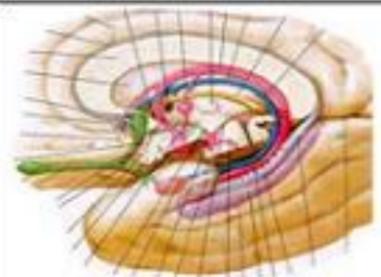


Evolution of Neuronal Tissue

Evolution of the human Brain — Triune Model



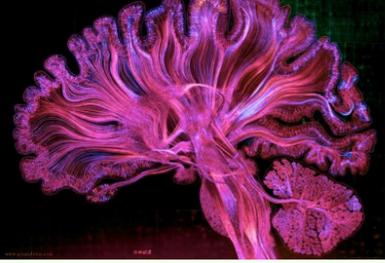
The R-Complex (Reptile): Evolved during the Triassic Period **248-206 million** years ago. Regulates: hunger, temperature control, fight-or-flight response. Shared with reptiles such as fish.



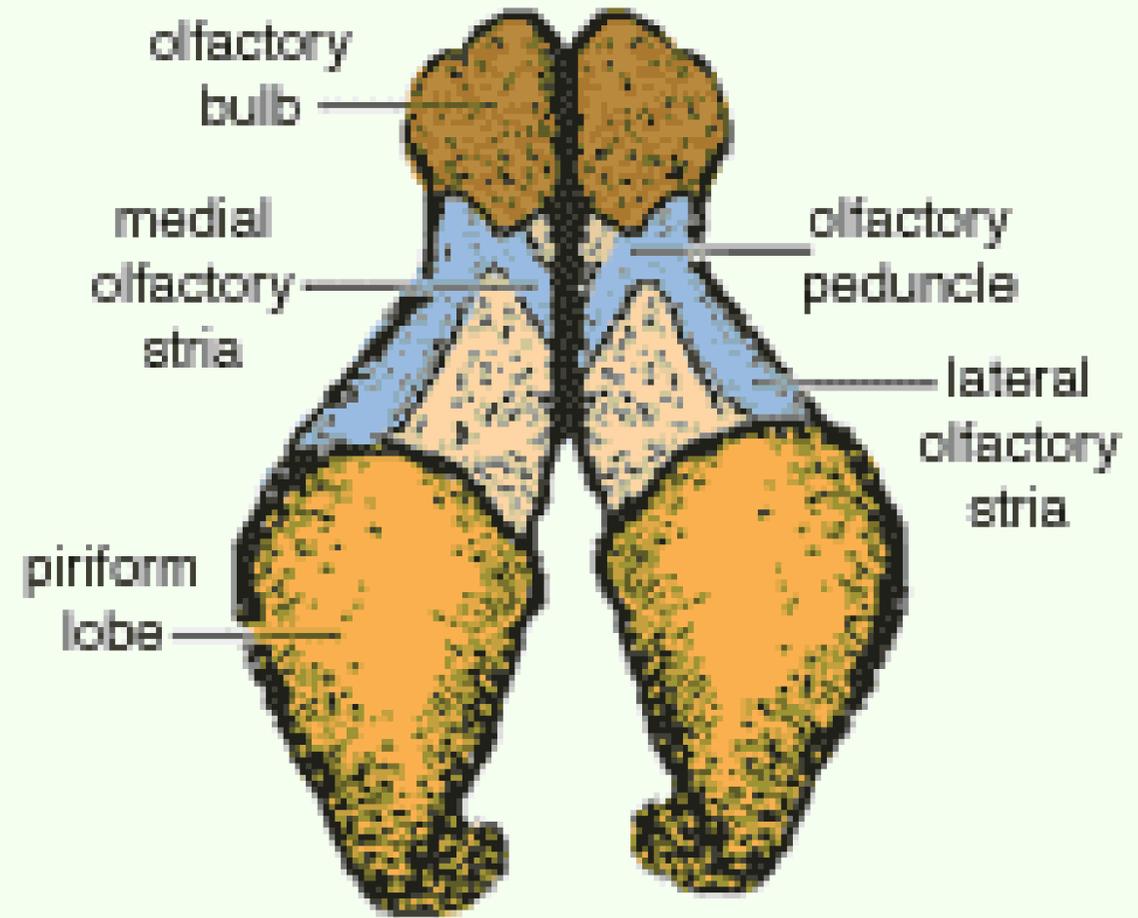
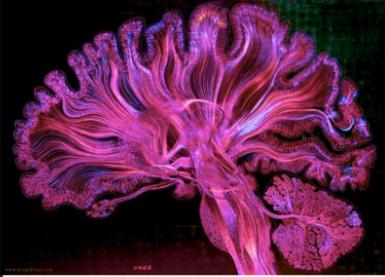
The Limbic System: Evolved during the Jurassic Period **206-144 million** years ago. Regulates: mood, memory, and hormone control. Shared with the older mammals such as dogs, cats and mice.



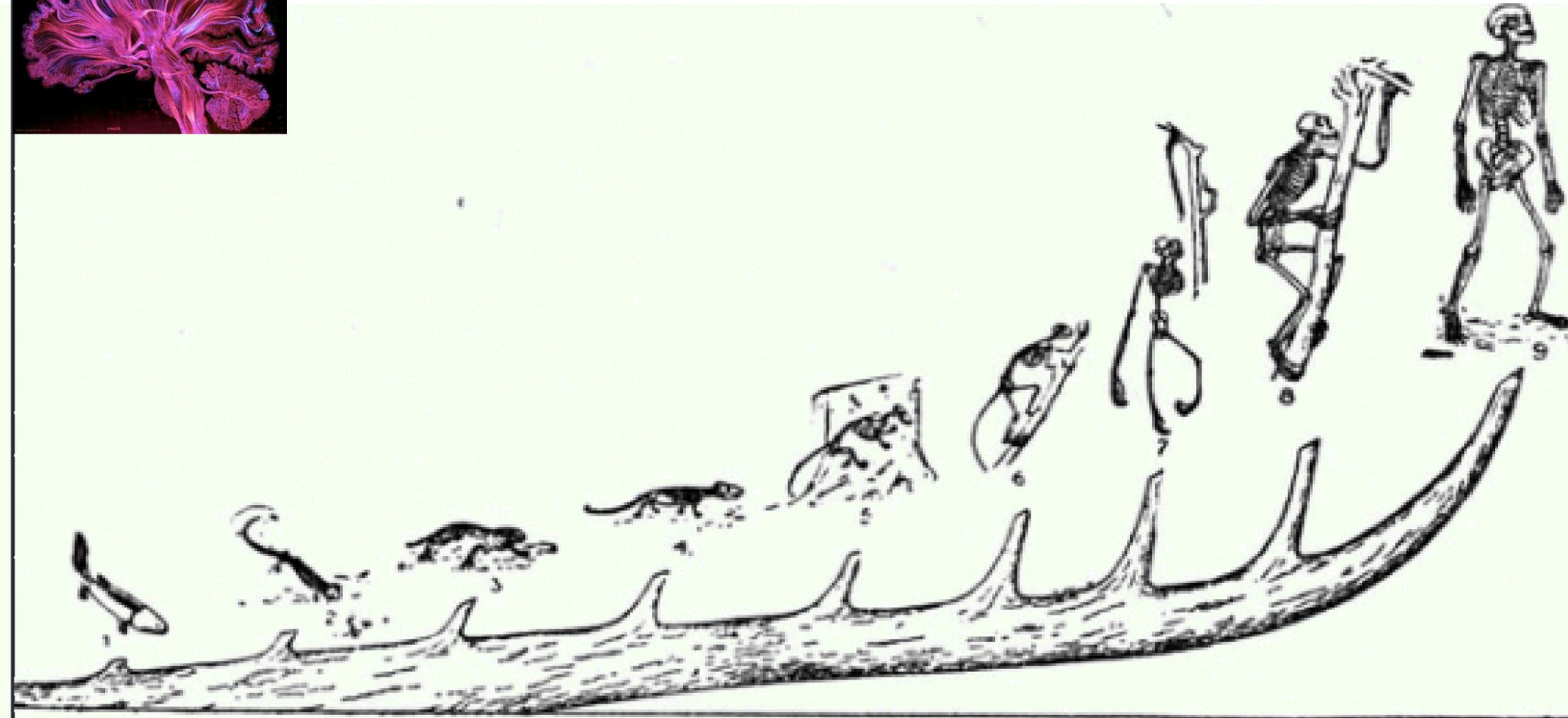
The Neocortex: Evolved during the Eocene & Oligocene Epochs **55-24 million** years ago. Regulates: logic and thought required for complex social situations etc. Shared with monkeys and chimpanzees.



Neuronal Tissue into the Rhinencephalon



Rhinencephalon
(ventral view)

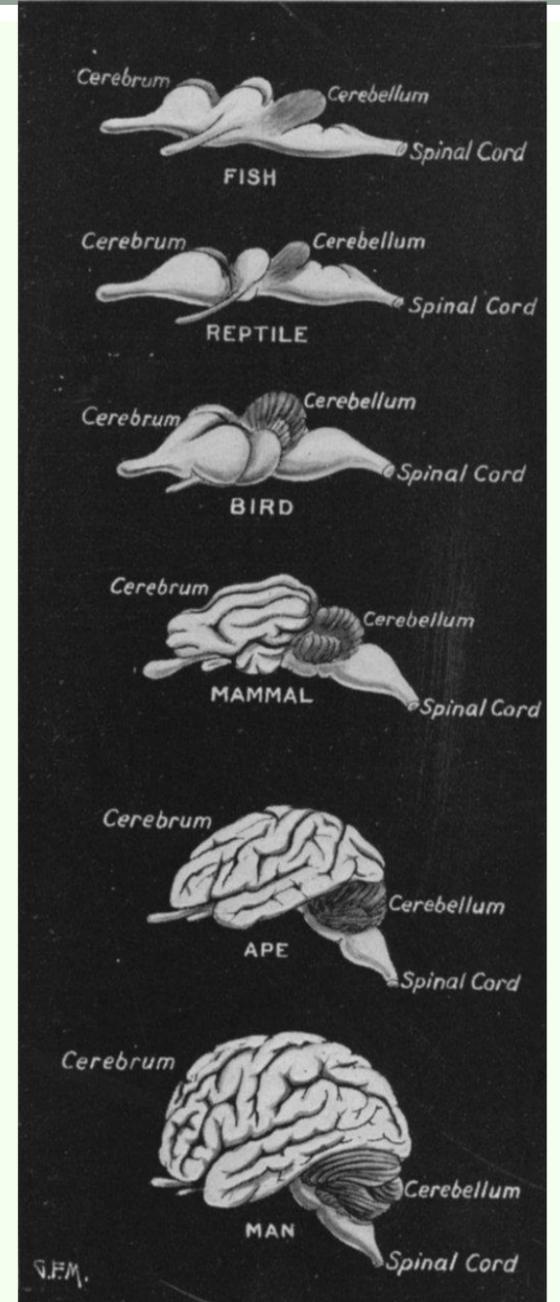
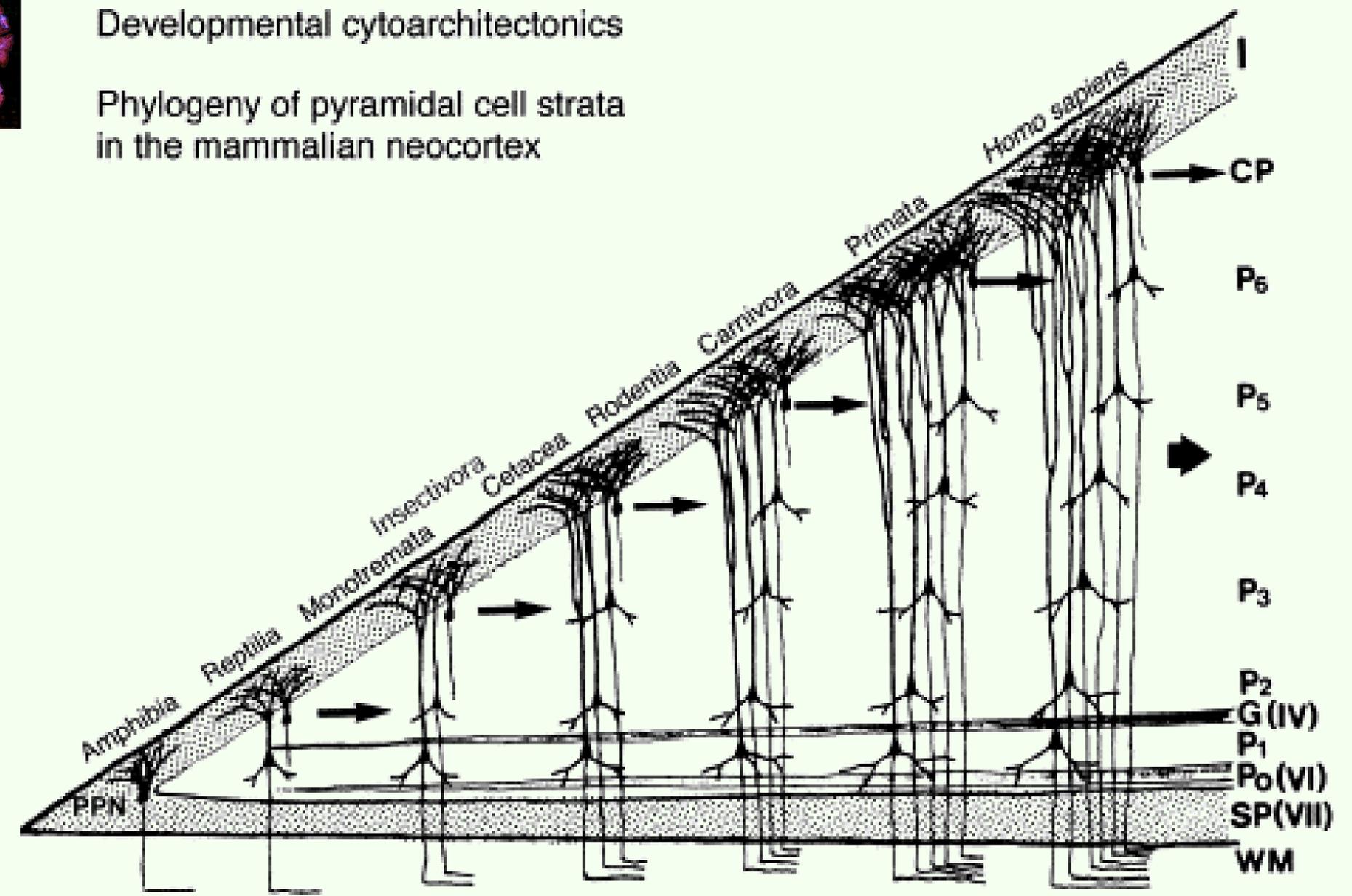


Evolution of mammals (320 million years)



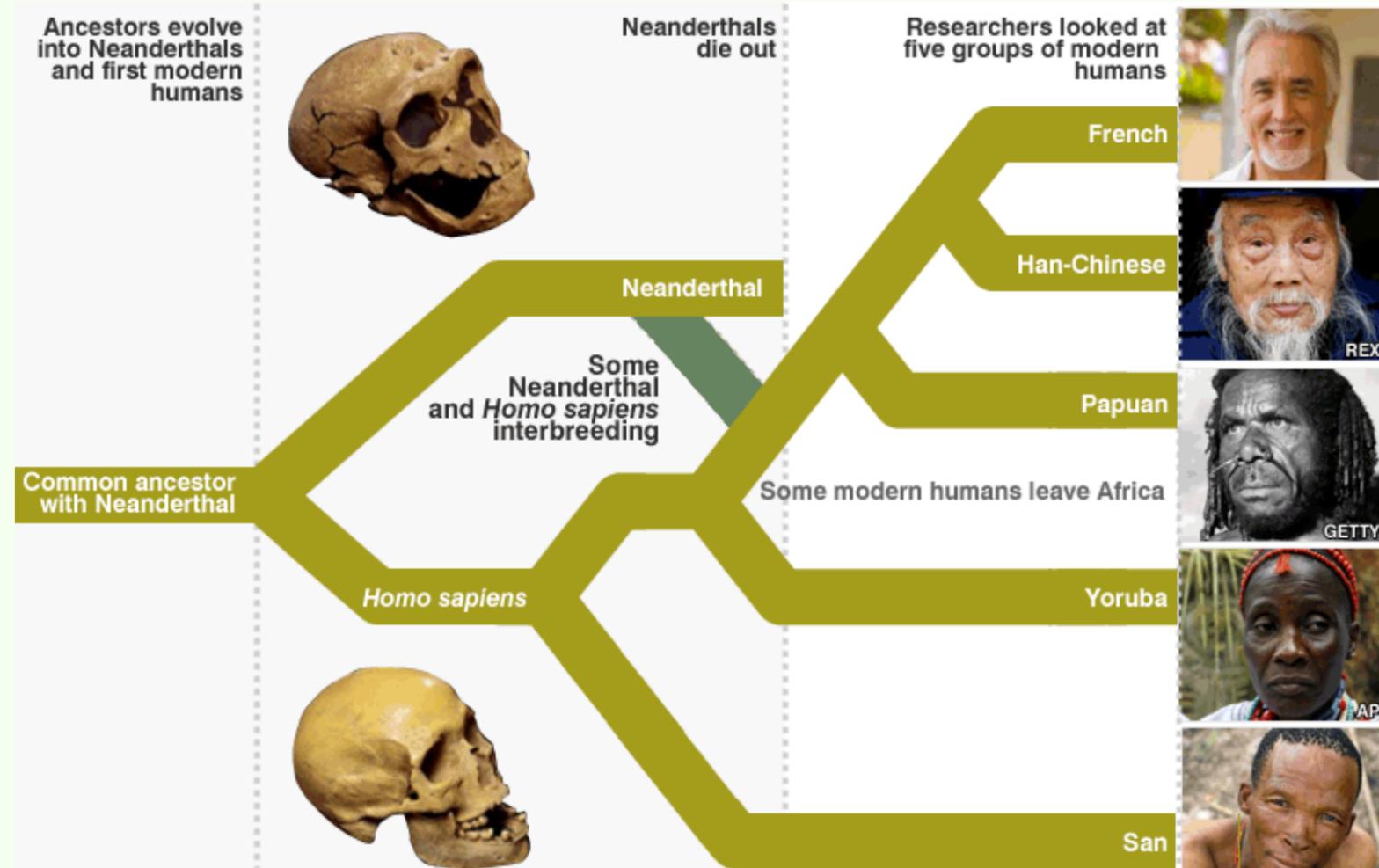
Developmental cytoarchitectonics

Phylogeny of pyramidal cell strata in the mammalian neocortex





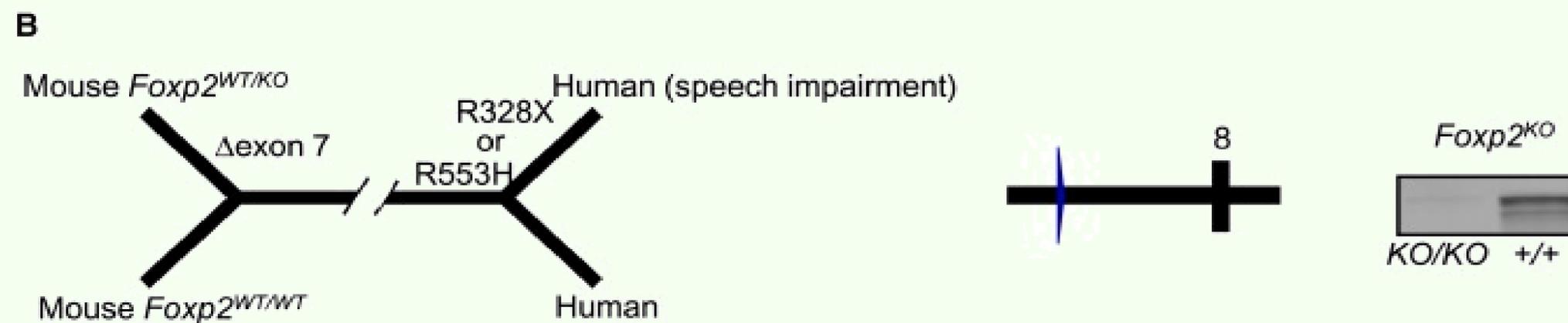
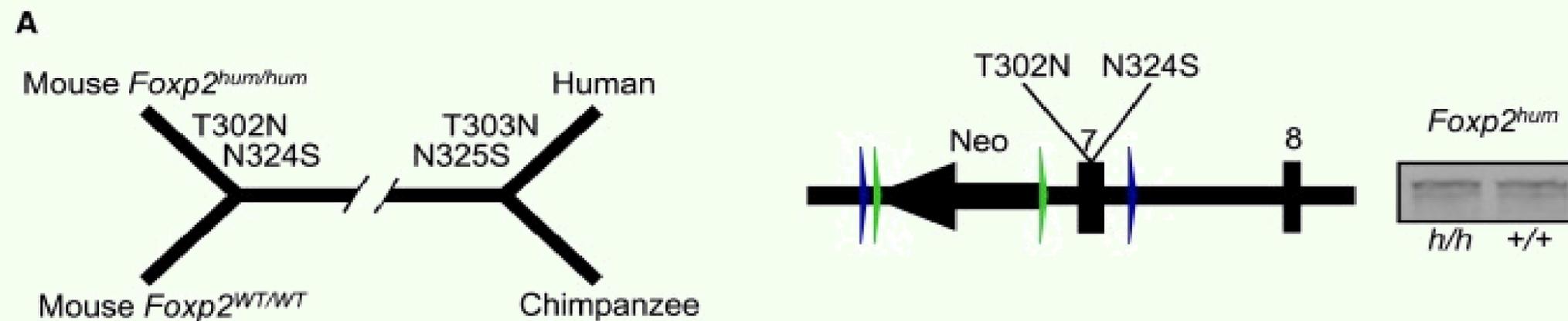
Unsuccessful efforts towards creation of Homo Sapiens





FOXP2 Gene Mutation and Power of Speech

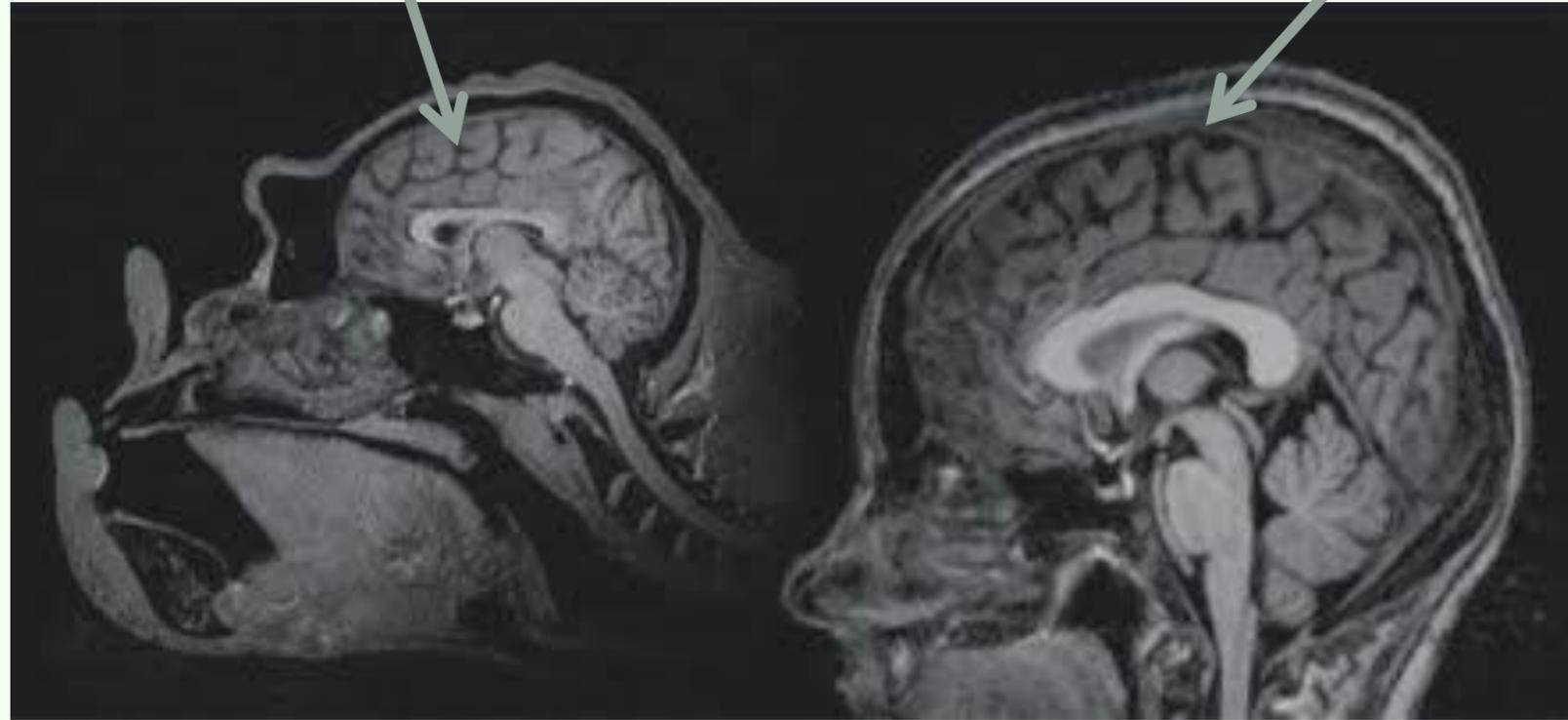
200,000 B.C.



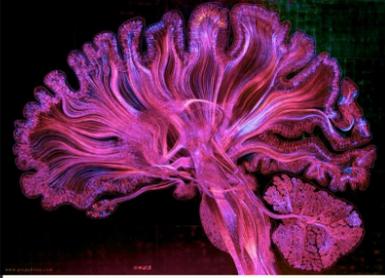


Chimpanzee

Human



30:1 ratio of neocortical gray matter to the size of the medulla in the brainstem of chimpanzees, while the ratio is 60:1 in humans



The Human Brain

The Expanded Neocortex

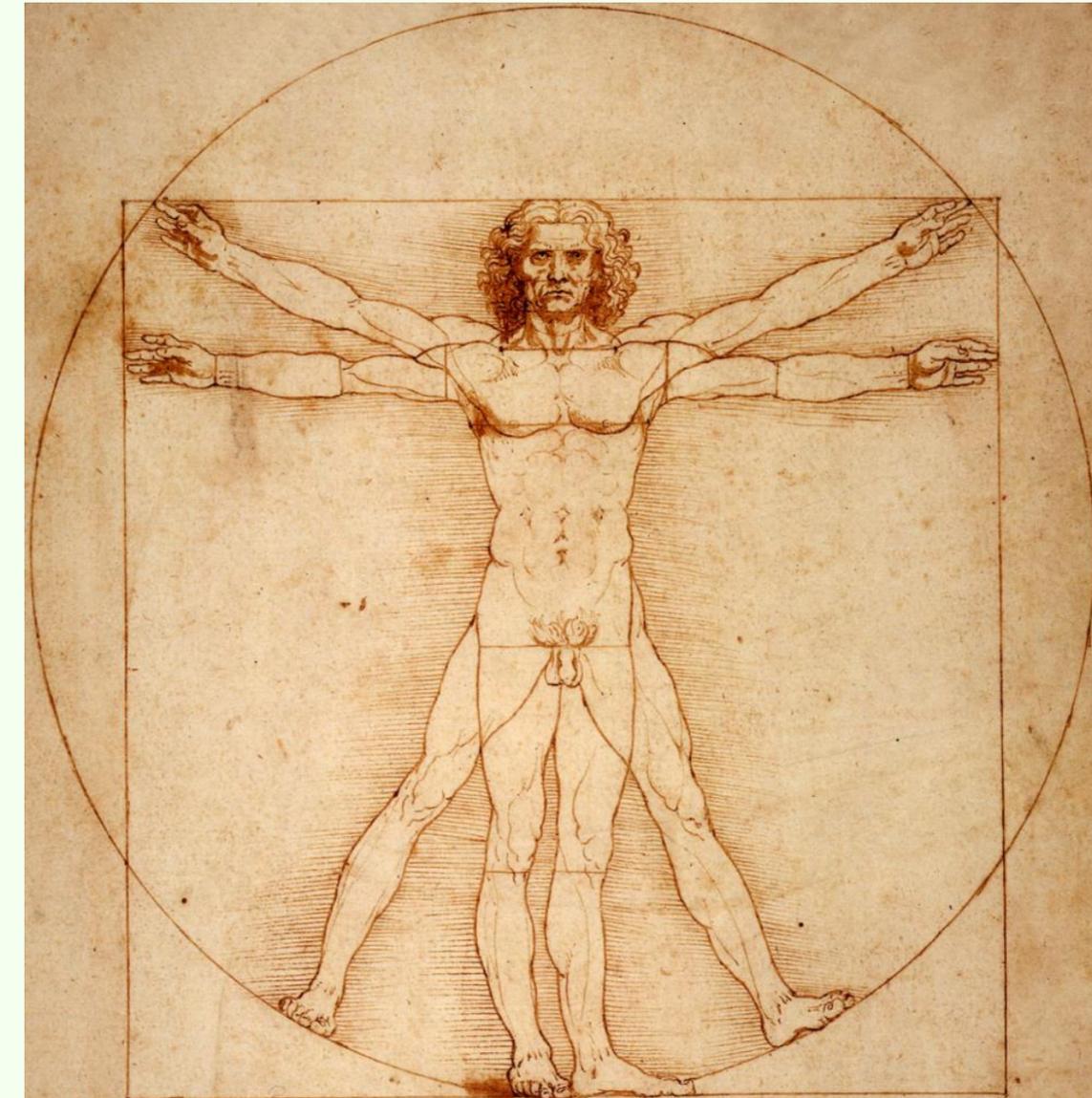
- Size from an early point in gestation and infancy, increased gyri formation
- Greater proportion of cortical surface area allocated to association rather than to primary sensory and motor areas
- Expansion of the ventral temporal association cortex which improves language processing
- ?? Serotonin and Dopamine receptors
- ?? Modulators or social behavior, i.e. oxytocin

200.000 years ago evolutionary handiwork of Homo Sapiens brain was finished in a structured and contemporary fashion with:

- the power of interspecies communication by extraordinary verbal facility and
- mathematical abilities
- altruistic qualities



We talked about the human brain...



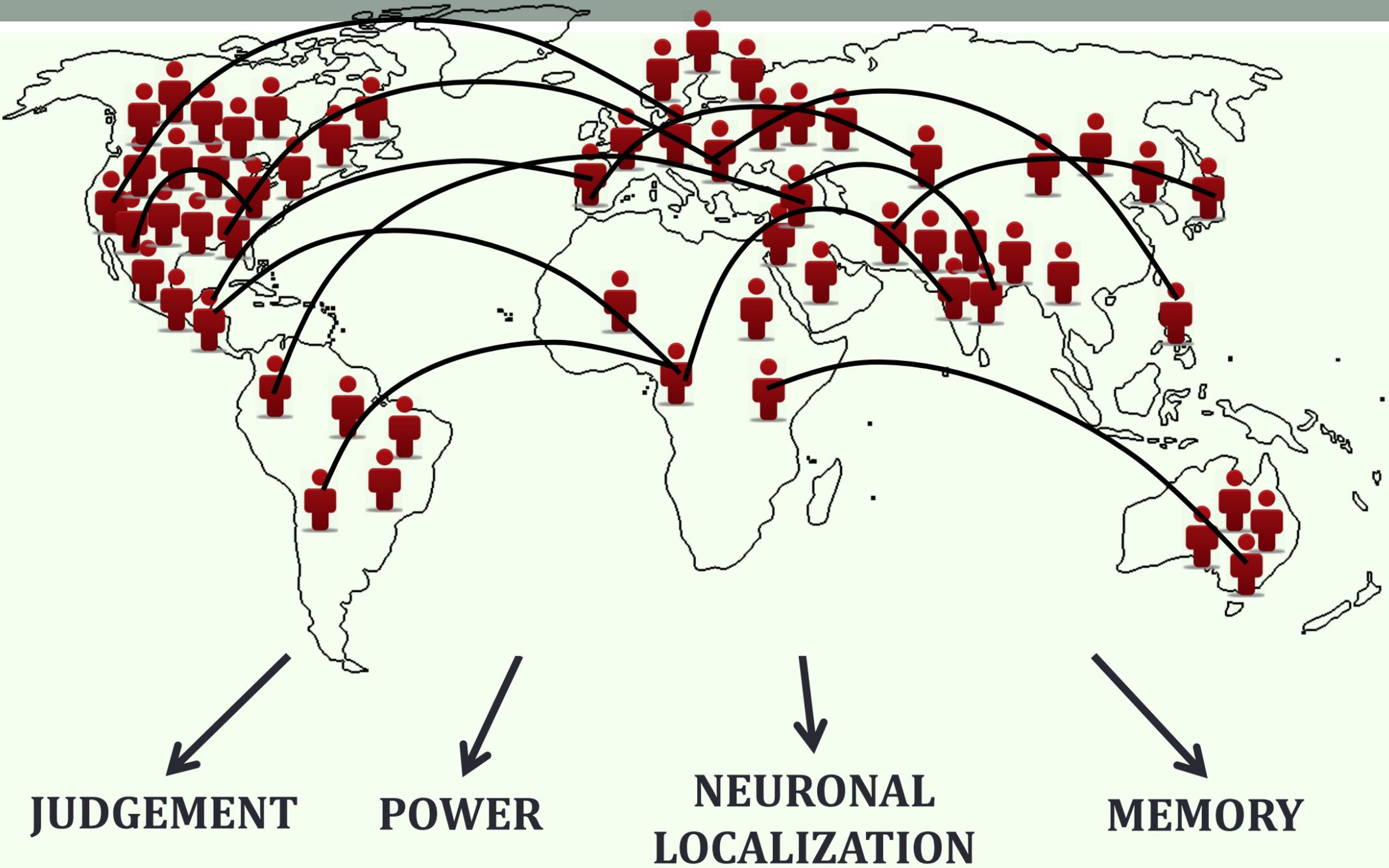
...and now!
Evolution continues

The World Brain



II

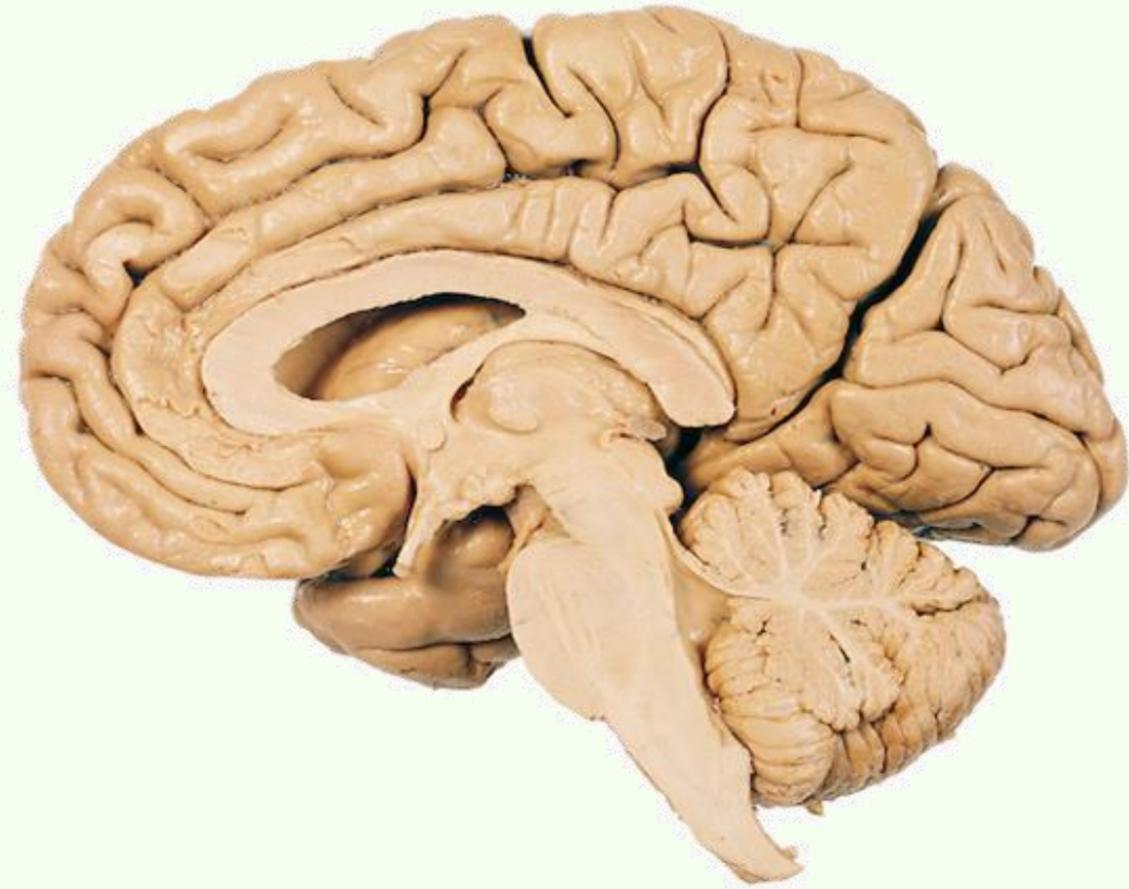
The advent of the World Brain and its surprising recapitulation of the Homo Sapiens brain development (the World Brain development indefinitely merges embryogenesis and evolution)



Our definition of the World Brain (The **HUMAN BRAIN** as a **NEURON**)

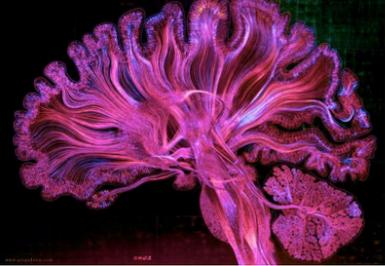
World brain is a consortium of all the Homo Sapiens on our planet connected to each other by varying means, able to share ideas and reach conclusions across vast distances upon pacific issues that comport with reality. From this understanding of reality great power cruise to those Homo Sapiens with those World Brain links. Every conclusion and observation of consequences is recordable and findable for those Homo Sapiens attempting to understand reality so that progress may occur in an exponential fashion. Strangely the structure of the World Brain seems to in many ways mimic to that of the human brain. As World Brain evolution has been so rapid the process continues in a dynamic if unstable fashion. Many Homo Sapiens are only indirectly connected to its fiber network resulting in considerable instability.

Symbiosis of the organic Human Brain and machines and devices under its control



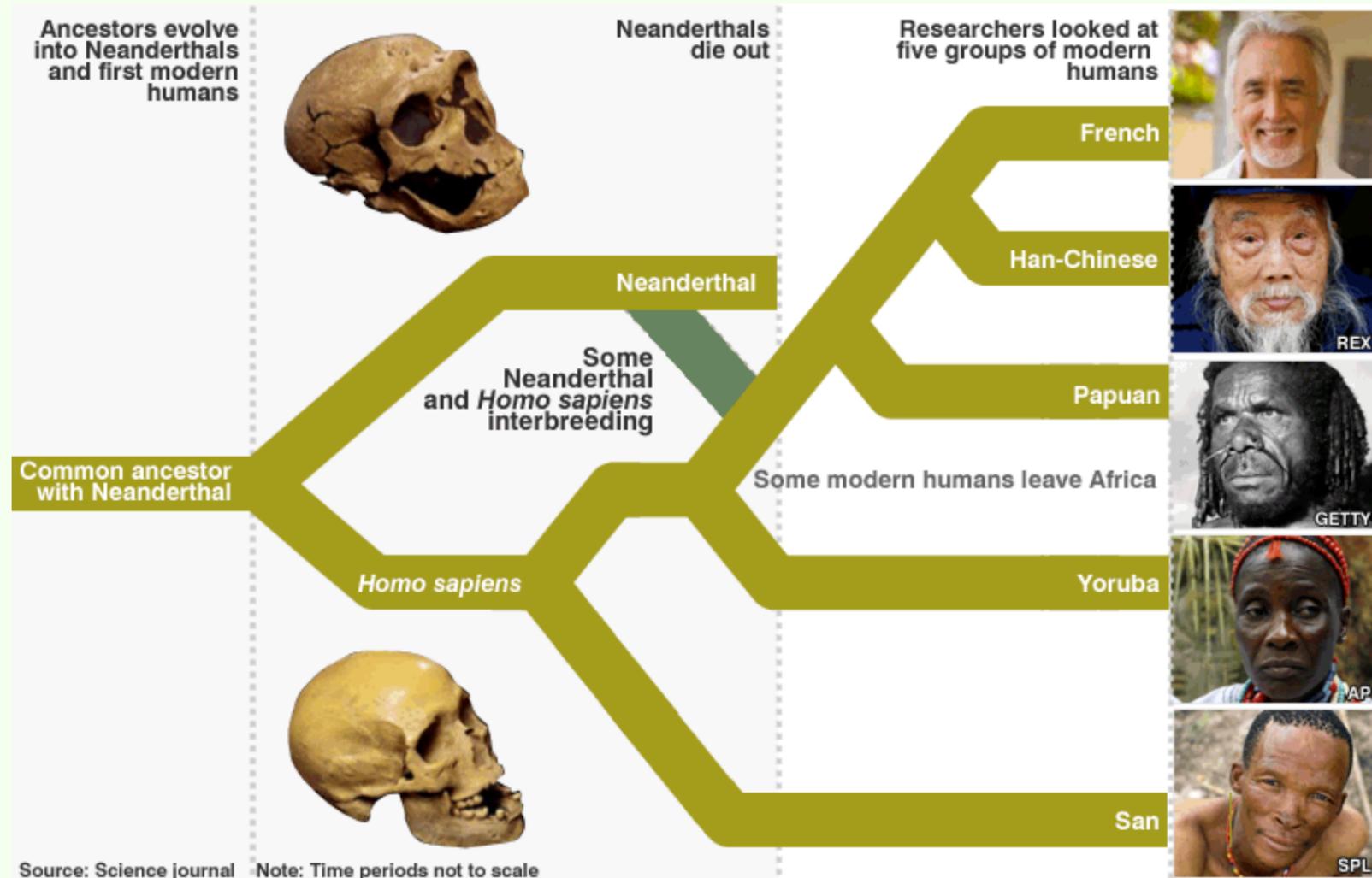


Efforts to create the world brain

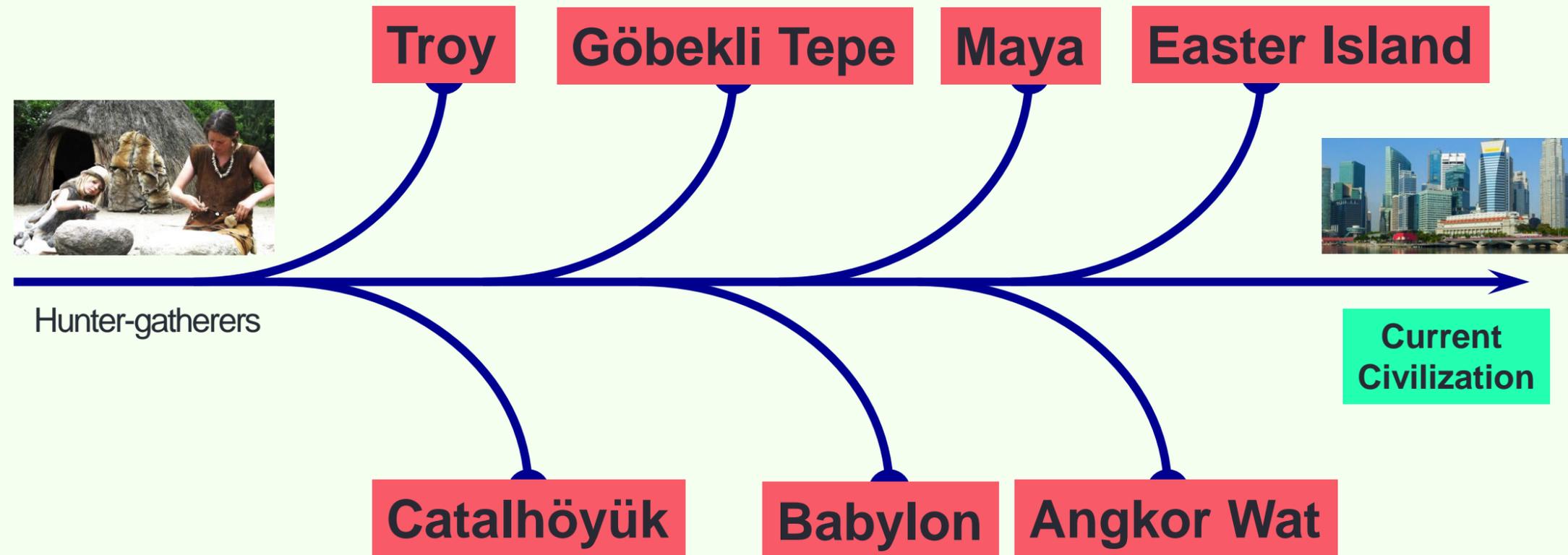


We compare it to...

Unsuccessful efforts towards creation of Homo Sapiens



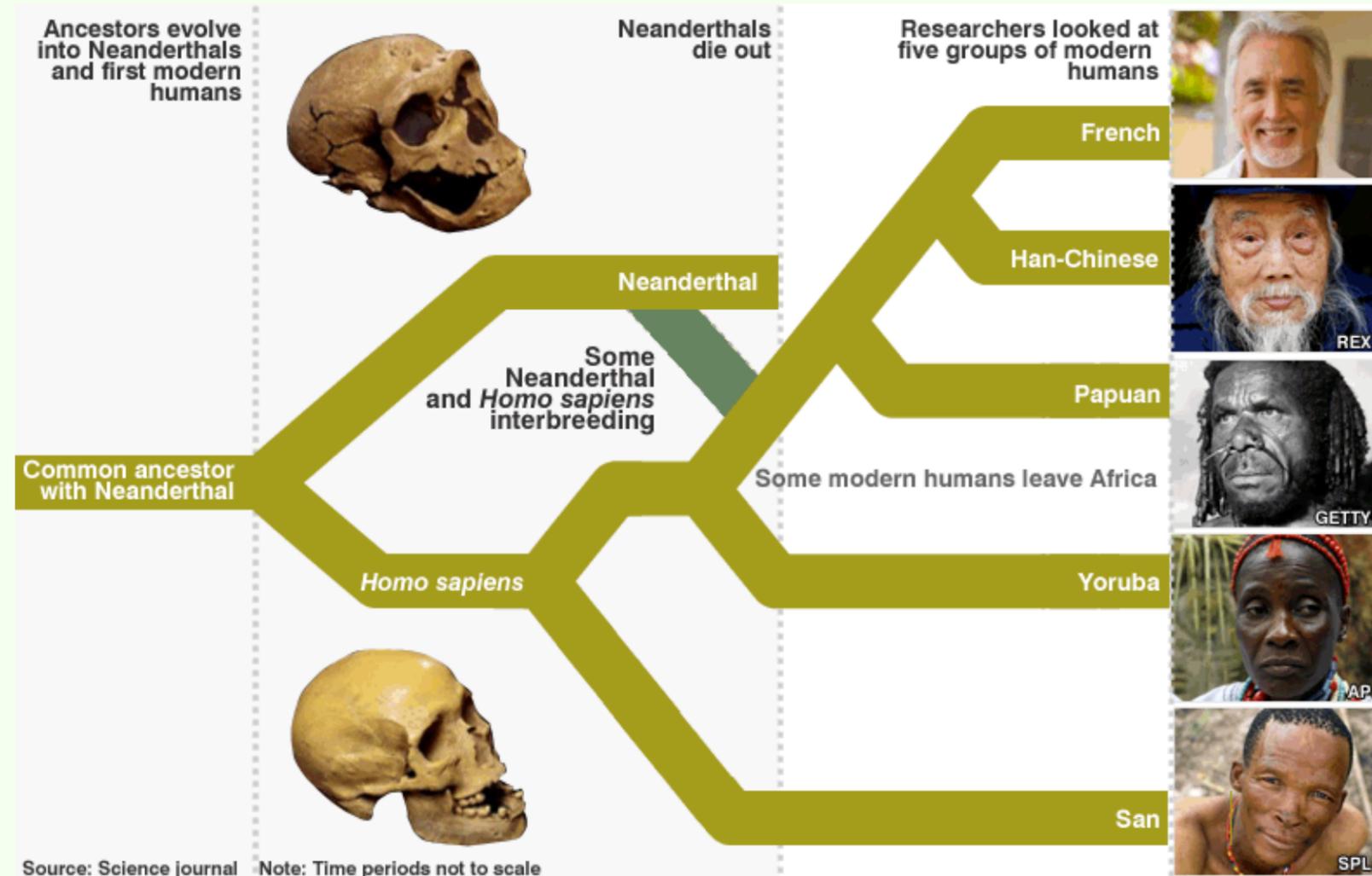
Unsuccessful efforts to hatch out the world brain





We compare it to...

Unsuccessful efforts towards creation of Homo Sapiens

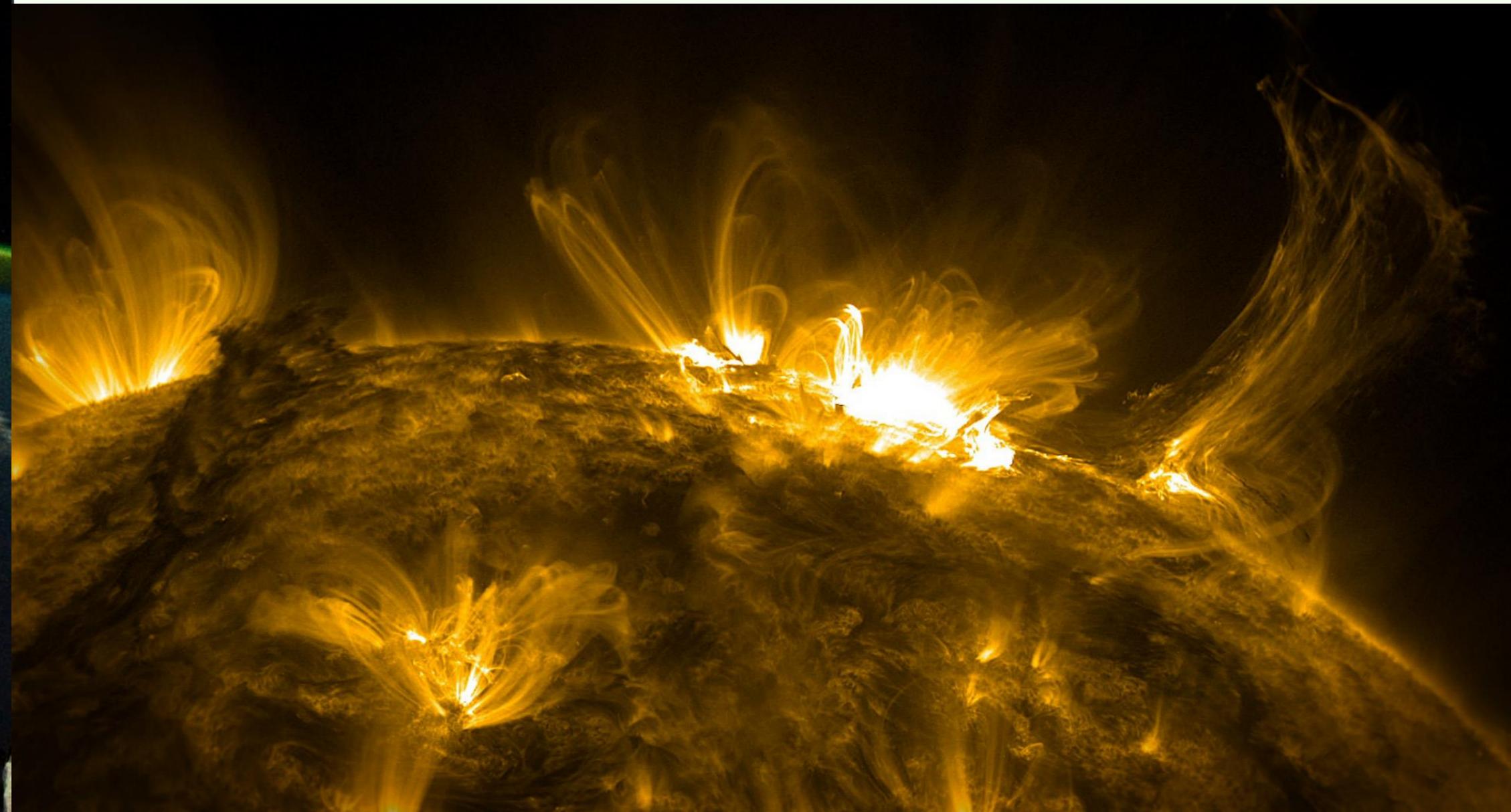


Angkor Wat





Unsuccessful efforts towards creation of World Brain





Rome, 100 A.D.

Finally, evolutionary die-off of Roman Empire became a fertilizer for current civilization



Visigoths Destroy Rome, 410 A.D.

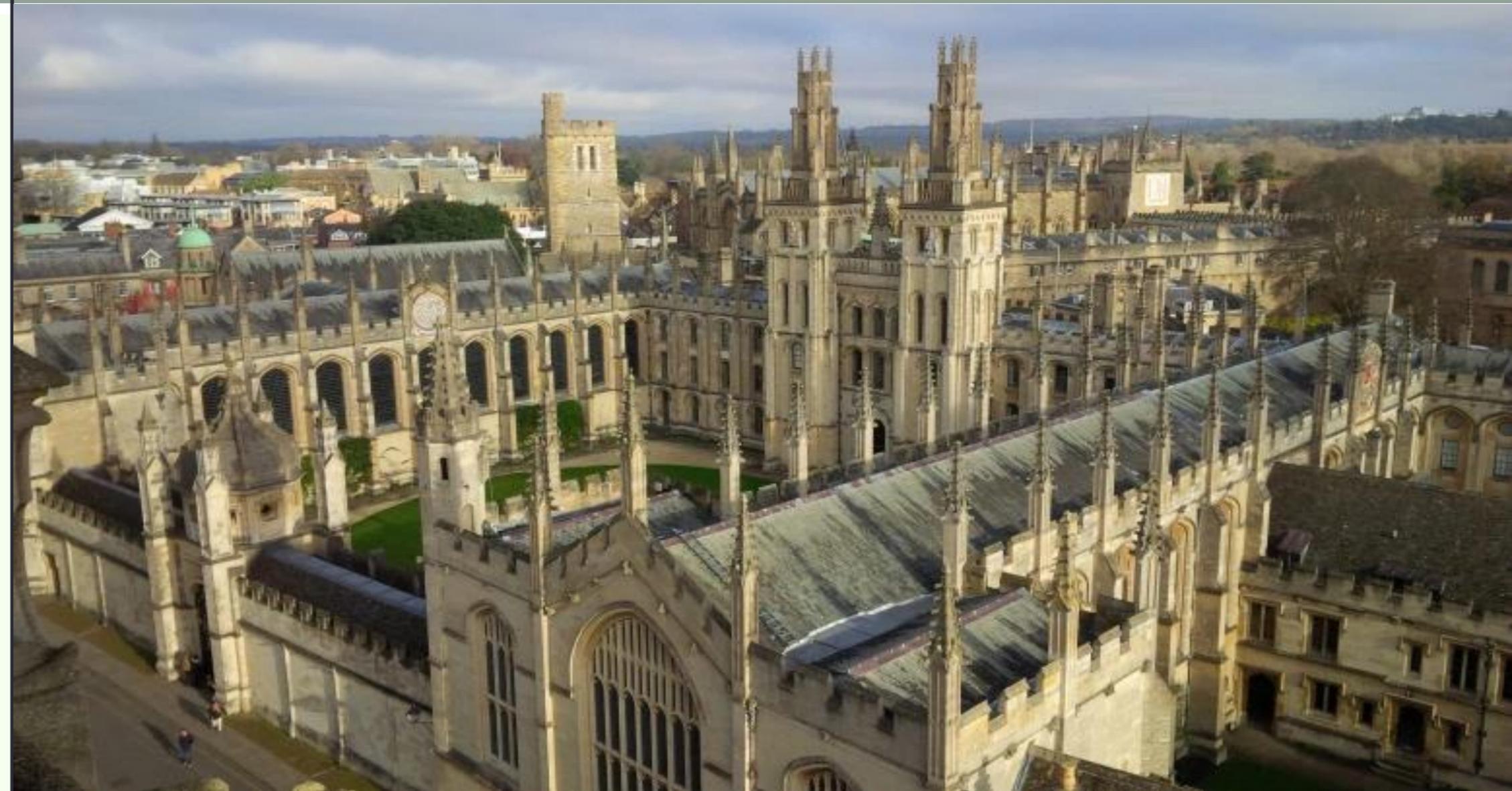


27

Fall of Roman
Empire



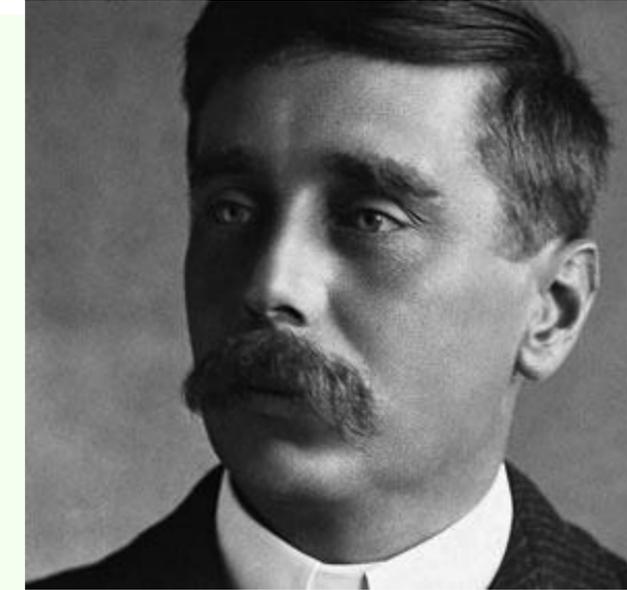
Beginning of
Renaissance in
Florence



Oxford University

Mentions about world brain

- H.G. Wells – “World Brain” 1936 - World Library
- Arthur C. Clarke – “Profiles of the Future” 1962 – Supercomputer with artificial intelligence
- Eugene Garfield – publication in journal “Science” 1964 – science citation index
- Peter Russell – “The Global Brain” 1982
- Gottfried Mayer-Kress – 1995 – Utilization of internet
- Brian R. Gaines – 1996 "Convergence to the Information Highway" - World Wide Web as an extension of Wells's "World Brain"
- Doug Schuler – 2001 civic intelligence network as the fulfillment of Wells's world brain
- **Wikipedia – 2001** – Wells' World Brain is the precursor to Wikipedia
- Global Brain Institute (GBI) – 2012 - Vrije Universiteit Brussel



H.G. Wells
World Brain - 1937



Peter Russell
Global Brain - 1982

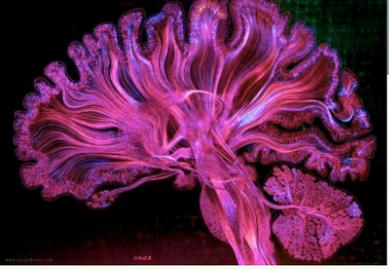
Now!

**More specificity and comparison with the
Homo Sapiens Brain**

Homo Sapiens brain vs. the World Brain



1. Number of neurons
2. Cytoarchitecture (and imprinting)
3. Sensation (receptors)
4. Encoding
5. Communication (fiber tracts)
6. Localization
 - a. Migration of humans as a springboard for localization
 - b. Few examples
7. Memory formation and retrieval (**system integration**)
8. Summary



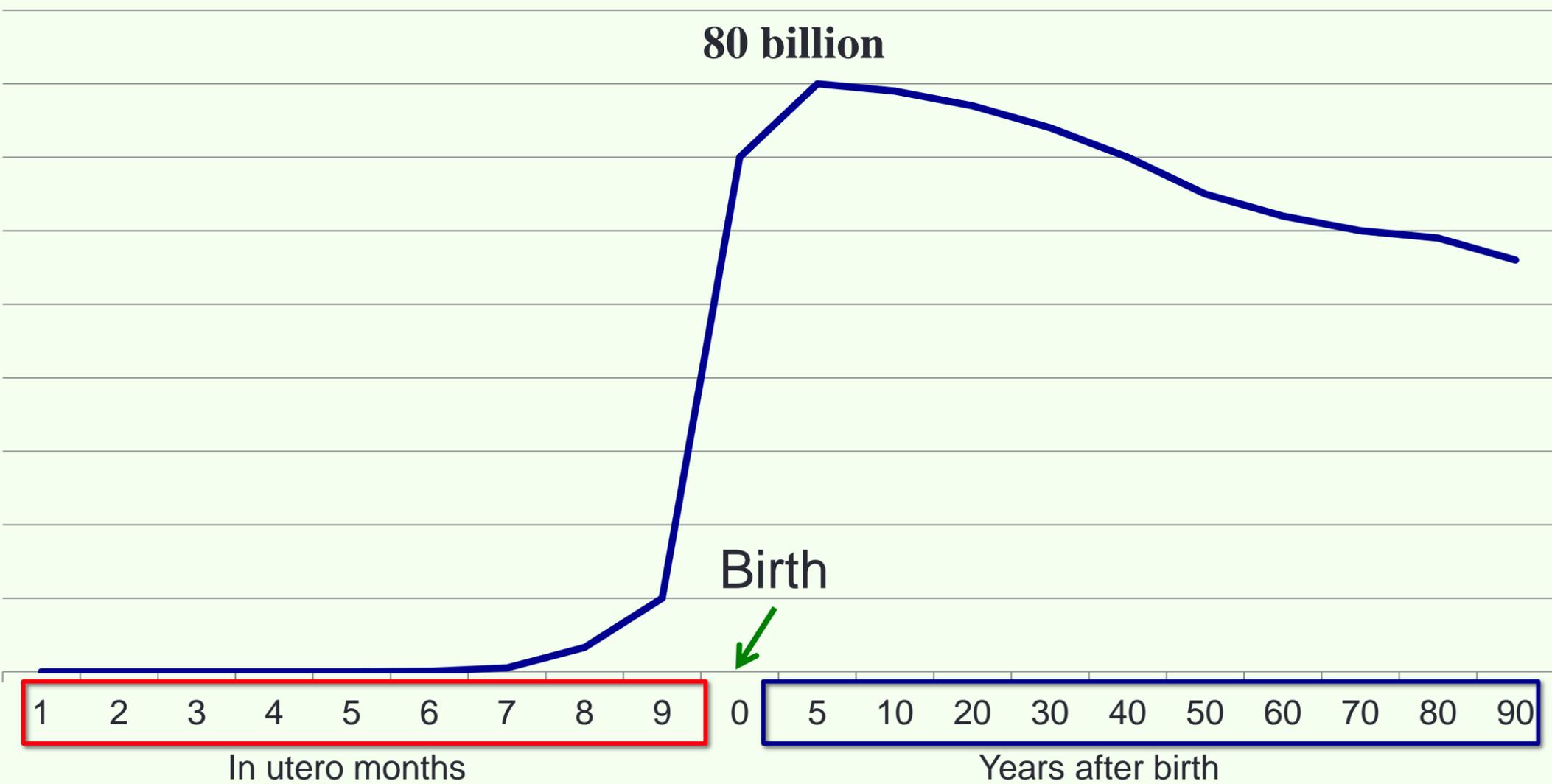
1. Number of Human Brain neurons



1. Number of World Brain neurons (Homo Sapiens)



Embryogenesis of the human brain number of neurons

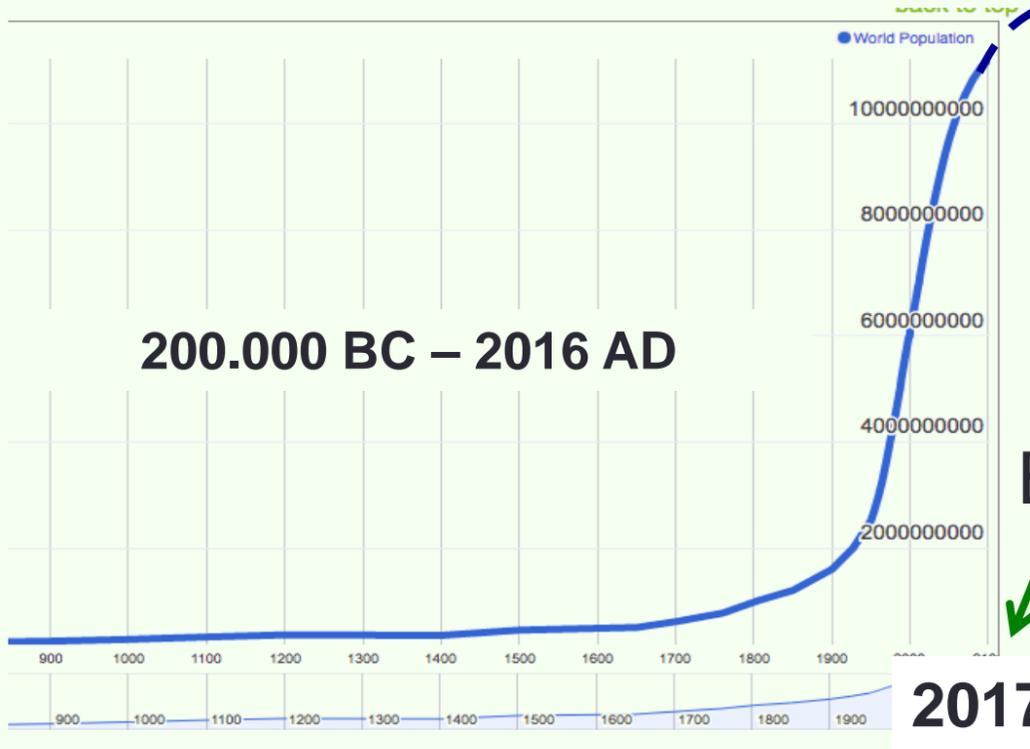


World Brain – Homo Sapiens population



World Population: Past, Present, and Future

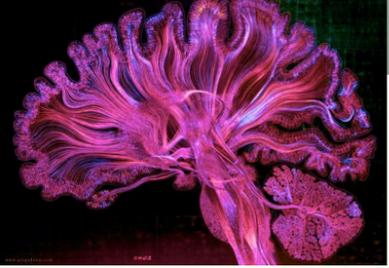
(move and expand the bar at the bottom of the chart to navigate through time)



*World population on the rise?

+

-



Adult neurogenesis

- not a significant source of new neurons

- Striatum
 - Production of interneurons (connector neurons)
- Dentate gyrus of hippocampus
 - 700 new neurons every day
 - Some participate in memory formation
 - Most are short living
 - The rest is functionally integrated into the brain tissue
- Olfactory bulb
 - Few new neurons if any



World brain neurogenesis - Human reproduction

- The world brain is dynamic with human population constantly dying and being reproduced (almost like epithelium)
- Careless reproduction
- In 70 years almost every neuron in the world brain will be replaced
- In 700 years world brain will have as many neurons as in the last 70.000 years combined (108 billion)
- These neurons must be appropriately imprinted





2.Cytoarchitecture (and imprinting)



Human brain neural stem cell transcription factors

ASCL1/Mash1

ATF2

Brg1

CREB

CSL

EMX2

FosB/G0S3

FoxO3

GLI-1

GLI-2

HES-1

HOXB1

c-Jun

KLF4

MCM2

MCM7

MEF2C

MSX1

NeuroD1

NeuroD2

Neurogenin-1

Neurogenin-2

NKX2.2

NKX6.1

Olig 1, 2, 3

Olig1

Olig2

Olig3

p53

Pax3

Pax6

PRDM16/MEL1

Prox1

RCOR1/CoREST

Smad3

Smad4

Smad7

Snail

SOX1

SOX2

SOX3

SOX5

SOX6

SOX9

STAT Activators

STAT Inhibitors

STAT3

TCF-3/E2A

TCF-12/HTF4

ZIC1

ZIC3



World Brain transcription (imprinting) factors

Moral viewpoints

School

Universities

Socialization

Skills

Language

Art

Music

Religion

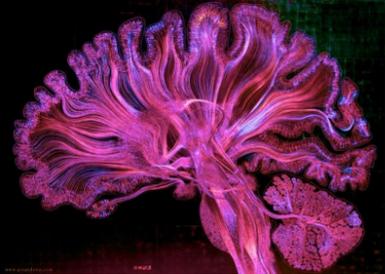
Experience

Advices

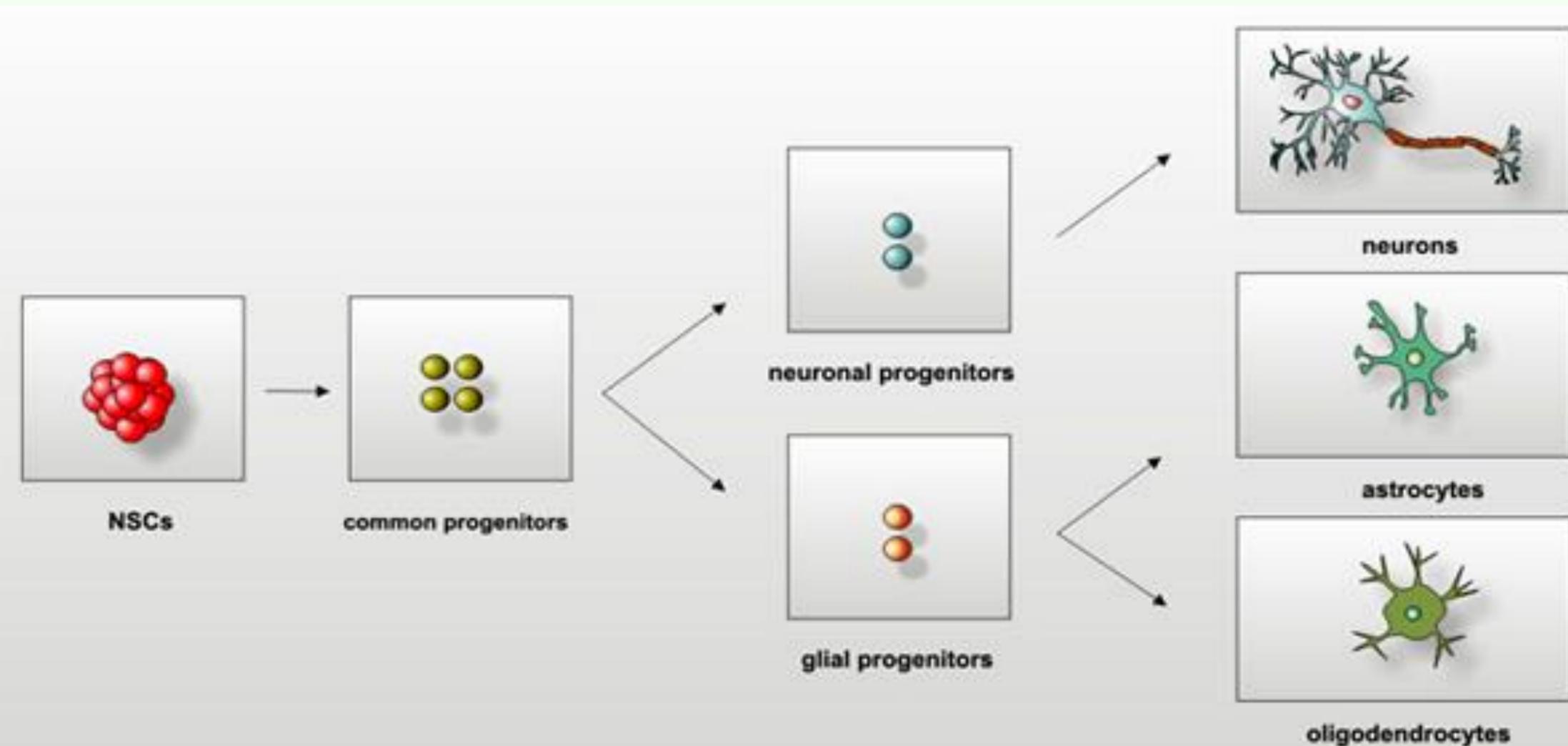
TV

Radio

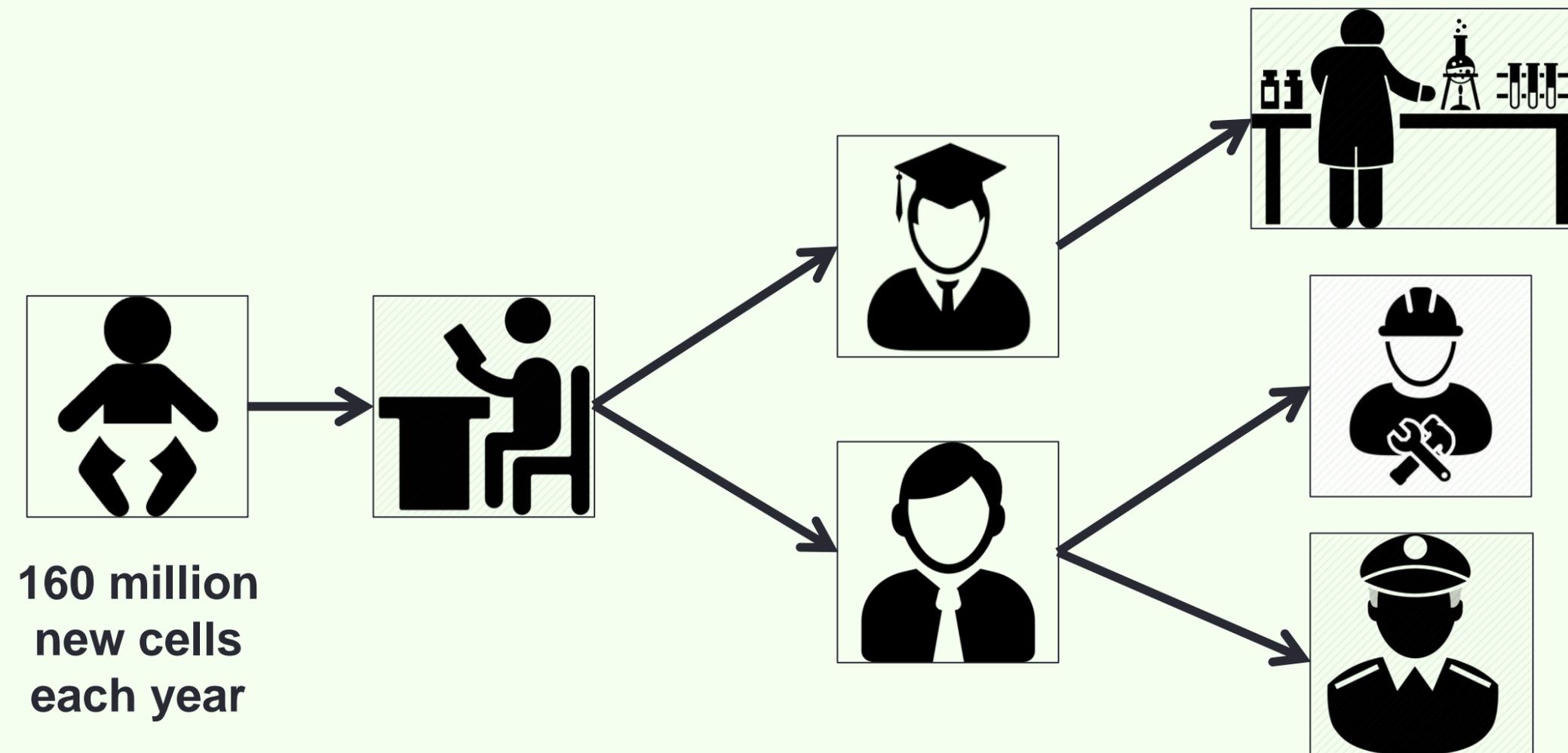




Human Brain neural stem cell differentiation



World brain neural stem cell imprinting and differentiation



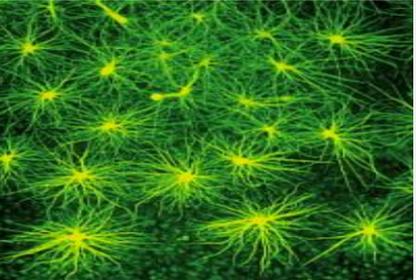
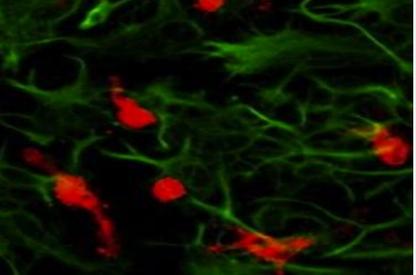


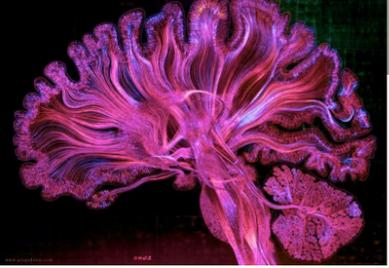
Human brain cytoarchitecture



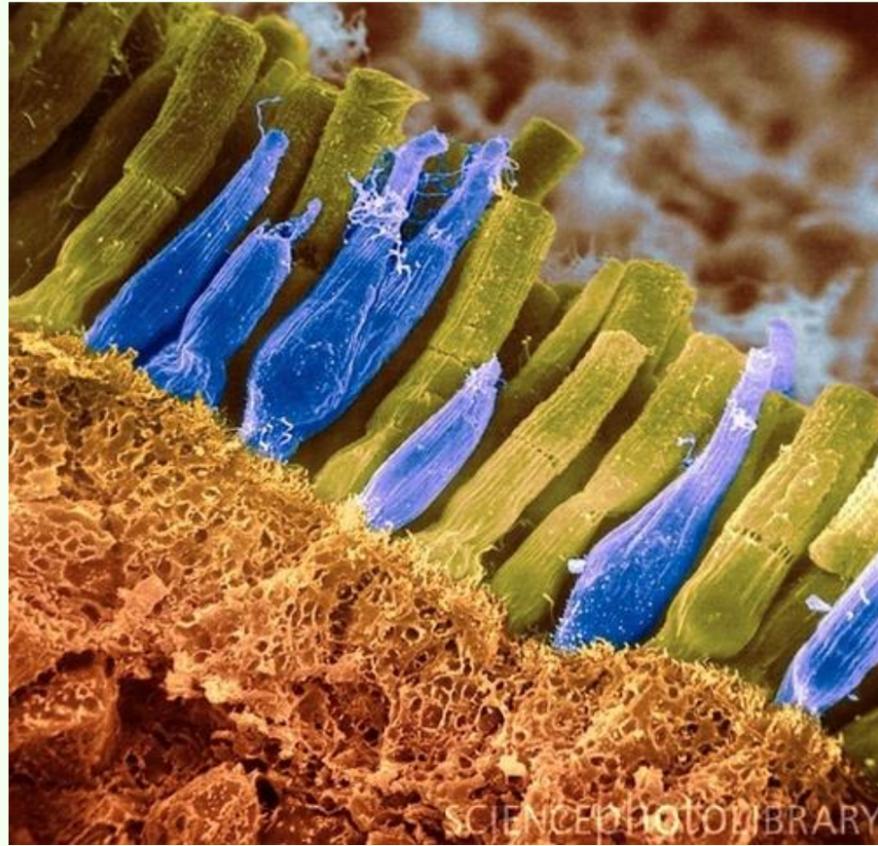
World brain cytoarchitecture



	Type	Function	Function	Analogy	
	Neurons	Cognitive abilities • Receiving signals • Processing signals • Transmitting signals	Cognitive abilities • Receiving signals • Processing signals • Transmitting signals	Scientists	
	Astrocytes	• Biochemical support • Formation of BBB • Role in repair process	• Biochemical support • Formation of BBB • Role in repair process	Agriculture Politicians Doctors	
	Oligodendrocytes	• Brain myelination	• Brain myelination	Transportation Communication	
	Microglia	• Immune function • Inactive without a trigger	• Immune function • Inactive without a trigger	Law enforcement bodies	



...evolution of photoreceptors
(540 million years ago)



3.Sensation (receptors)



Human senses

VISION

- Visible spectrum of light (390-700nm)

SMELL

- 30 different smell sensors

TOUCH

- Tactile
- Thermal
- Pain
- Proprioception

HEARING

- Frequency range - 20 Hz - 20,000 Hz
- Position
- Acceleration

TASTE

- Sweetness
- Sourness
- Saltiness
- Bitterness
- Umami
- Pungency (spiciness)
- Astringency
- Metallicness
- Calcium
- Fattiness (oleogustus)
- Heartiness (kokumi)

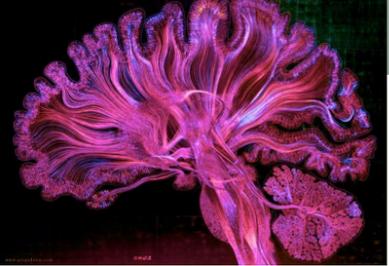


World brain senses (extraordinarily more powerful)



TYPES OF SENSORS (327)

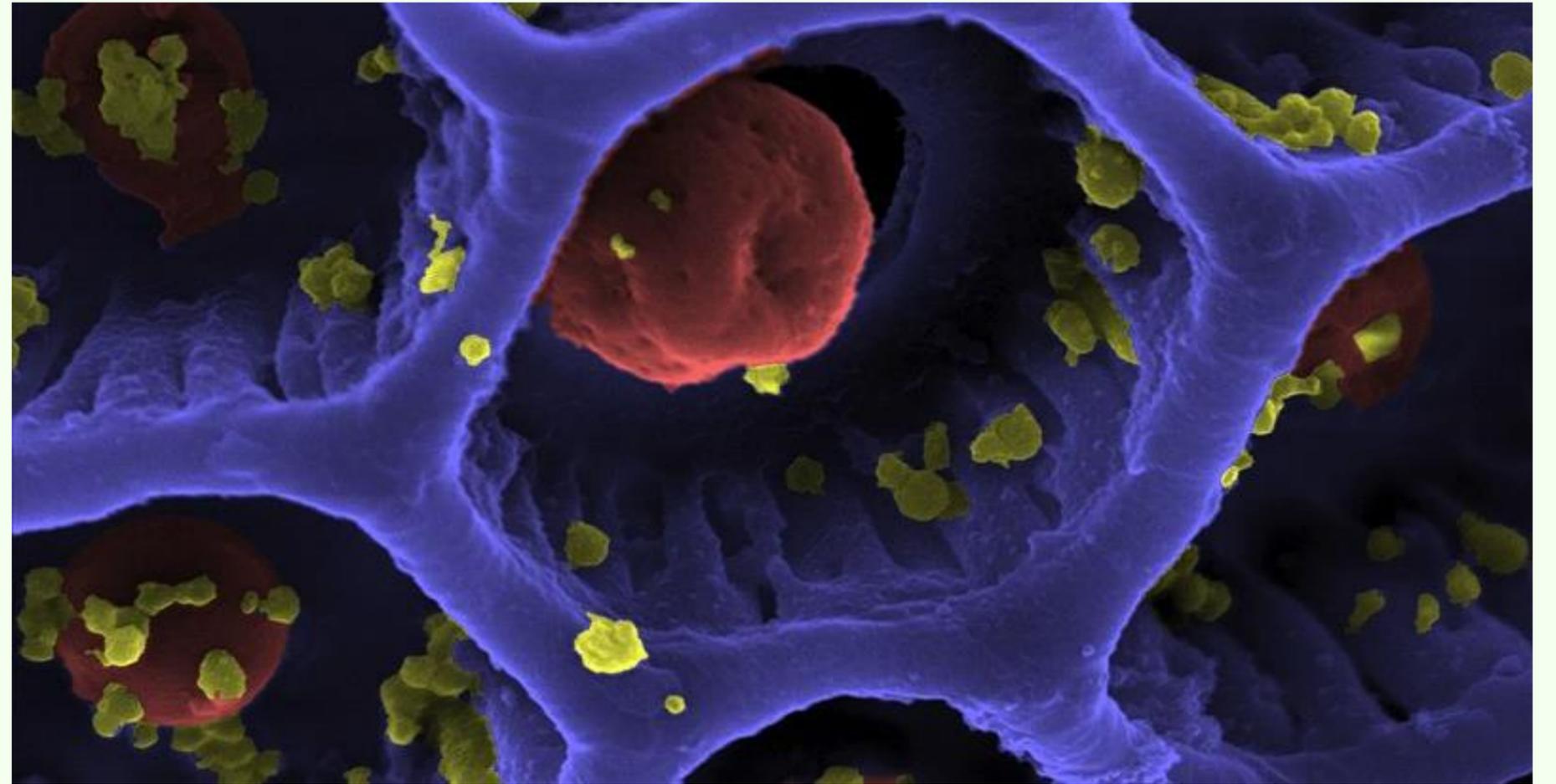
1. Acoustic, sound, vibration (5 types of sensors)
2. Chemical (29 types of sensors)
3. Electric current, electric potential, magnetic, radio (16 types of sensors)
4. Environment, weather, moisture, humidity (24 types of sensors)
5. Flow, fluid velocity (6 types of sensors)
6. Ionizing radiation, subatomic particles (4 types of sensors)
7. Navigation instruments (16 types of sensors)
8. Position, angle, displacement, distance, speed, acceleration (34 types of sensors)
9. Optical, light, imaging, photon (31 types of sensors)
10. Pressure (15 types of sensors)
11. Force, density, level (12 types of sensors)
12. Thermal, heat, temperature (22 types of sensors)
13. Proximity, presence (11 types of sensors)
14. Other (52 types of sensors)



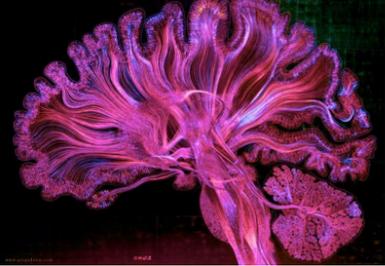
Human senses



World brain senses Scanning Electron Microscopy



Nanophotograph of pollen



Human senses



Night vision



World brain senses Infrared spectrum



Night vision





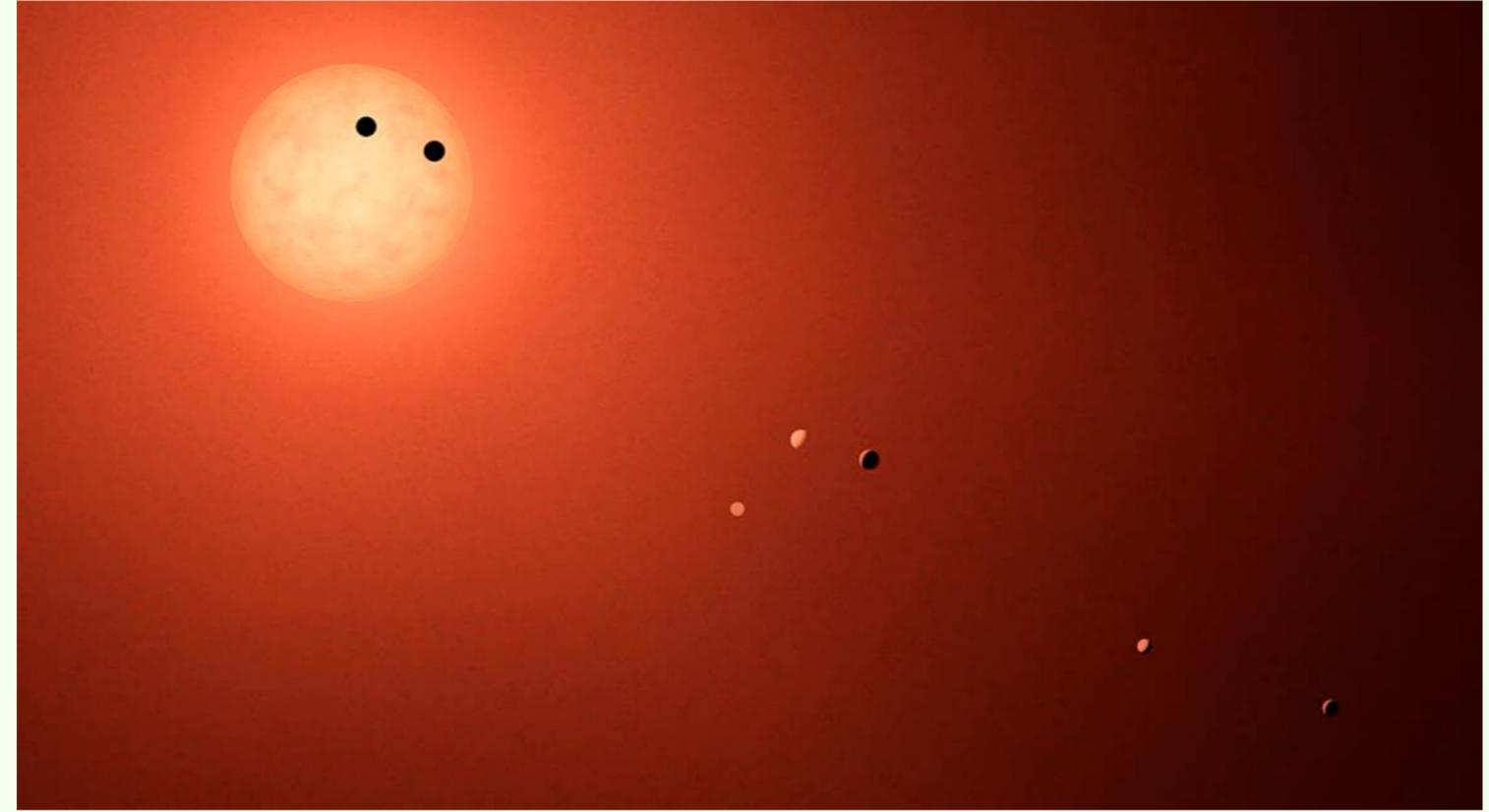
Human senses

Starry sky



World brain senses

TRAPPIST-1



39 light years away

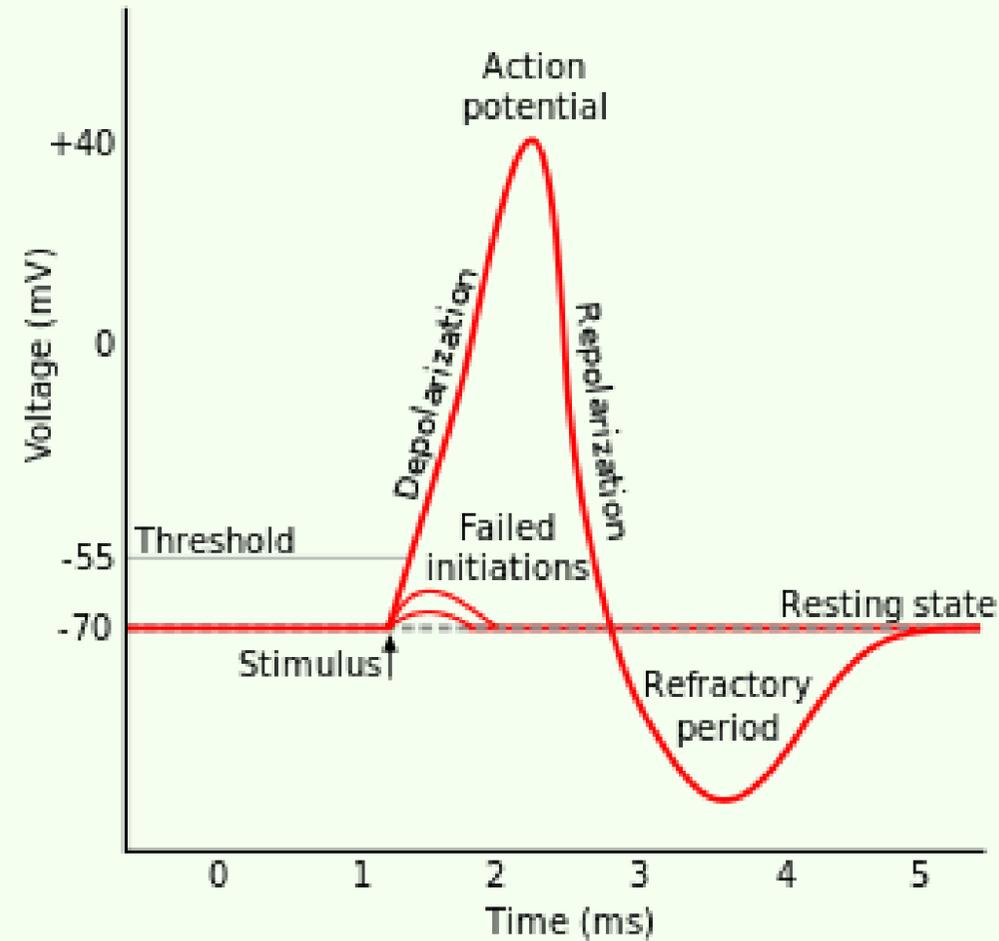




4.Encoding



Human Brain Encoding



Action potential



World Brain Encoding

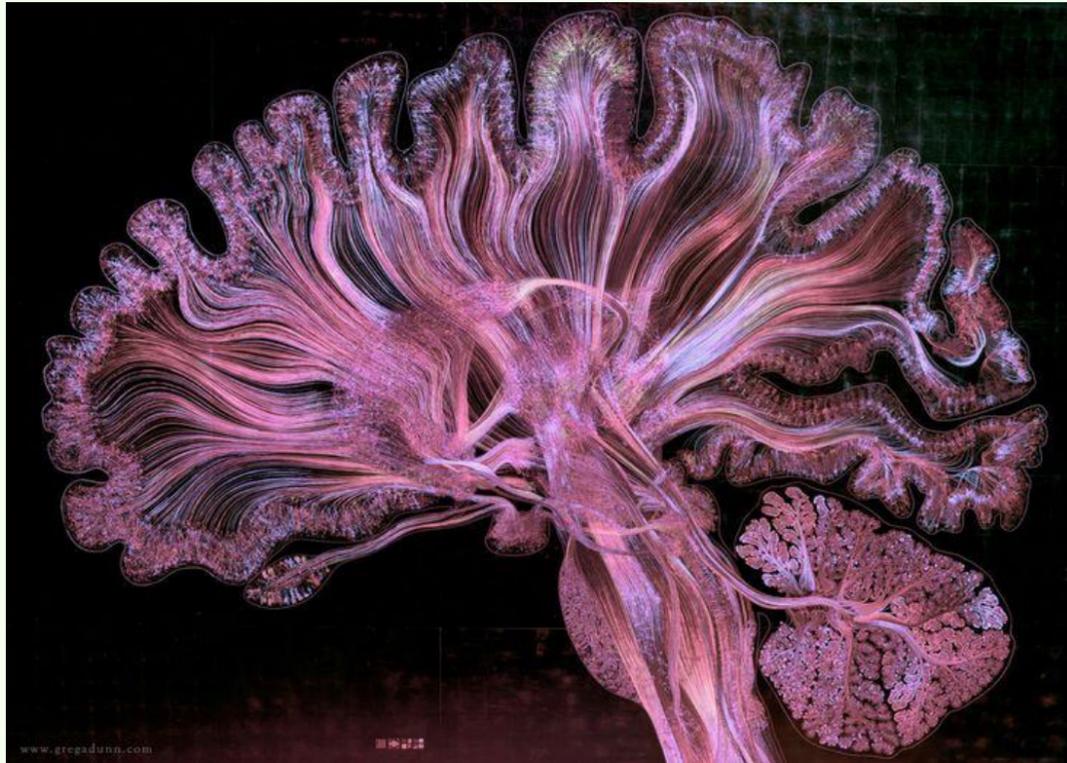


- Written symbolism 3000 BC (cuneiform and early hieroglyphics)
- 1500 BC Phoenician alphabet starts to evolve
- 300 BC Arabic numerals

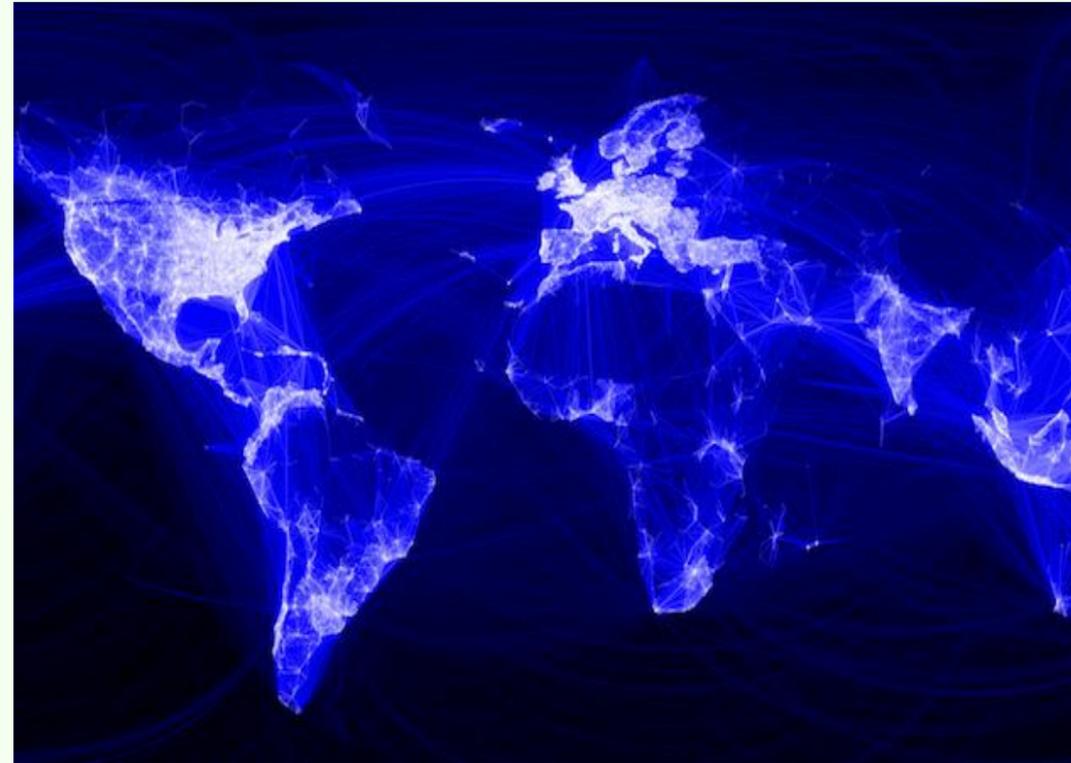
◊	۱	۲	۳	۴	۵	۶	۷	۸	۹
0	1	2	3	4	5	6	7	8	9
sifr	waahid	eeth-nayn	thalaatha	arba'a	khamsa	sitta	sab'a	thamaaneeya	tis'a

~The "zero" appears around the 3rd Century B.C.

Human Brain



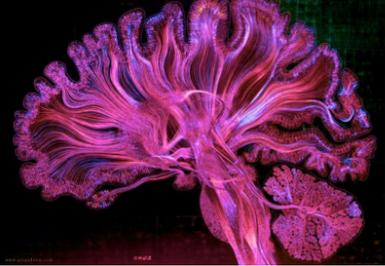
World Brain



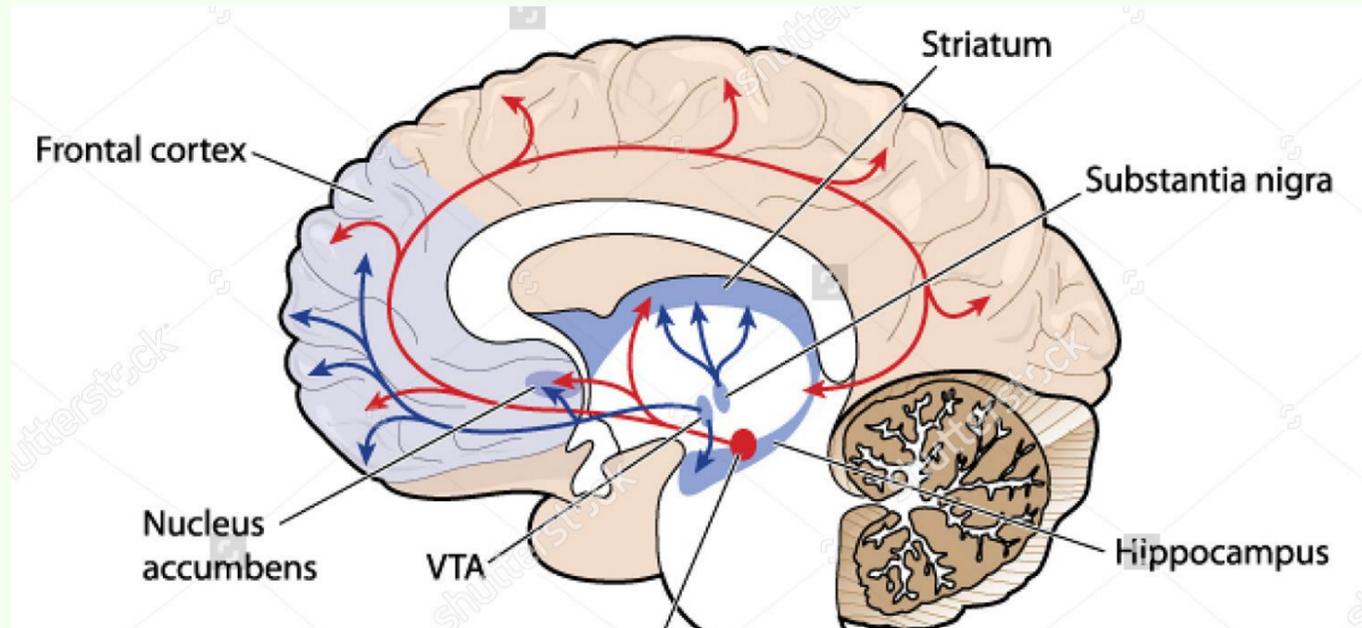
5. Communication (fiber tracts)

- a. New wiring system (better neurotransmitters)
- b. Increased speed of transmission
- c. Increased wiring system hook-up to neurons (Homo Sapiens)

5.a. New wiring system (better neurotransmitters)



Neurotransmitters in the Human Brain (Multiple specialized wiring system)



Dopamine pathways



Functions

- Reward (motivation)
- Pleasure, euphoria
- Motor function (fine tuning)
- Compulsion
- Perseveration

Serotonin pathways

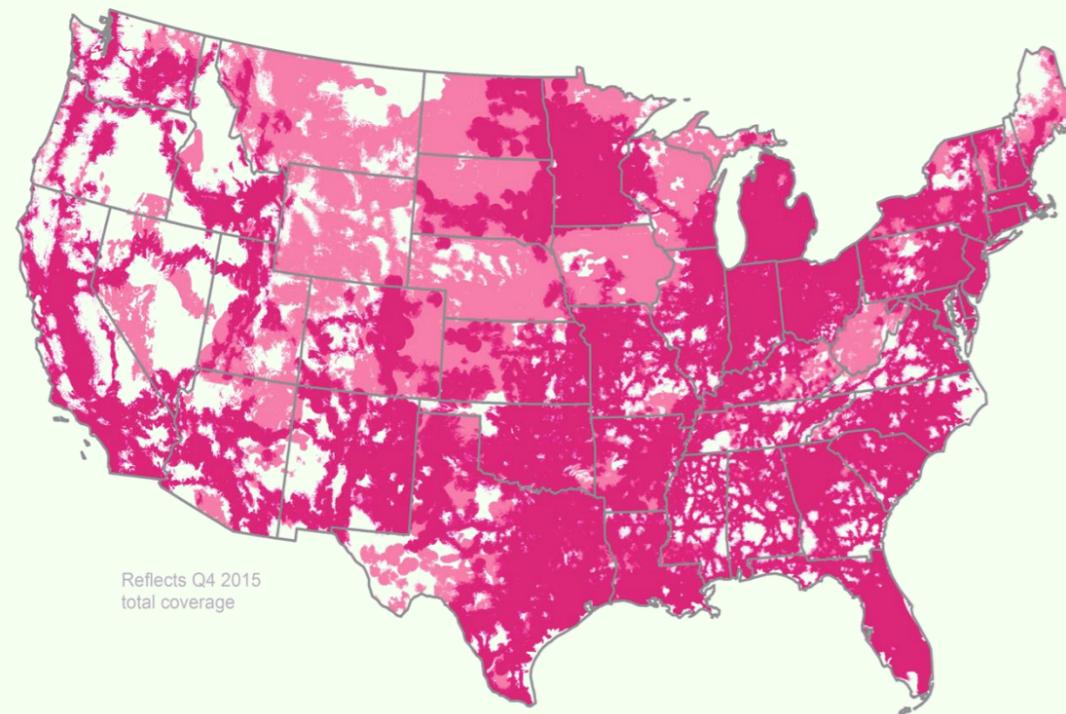


Functions

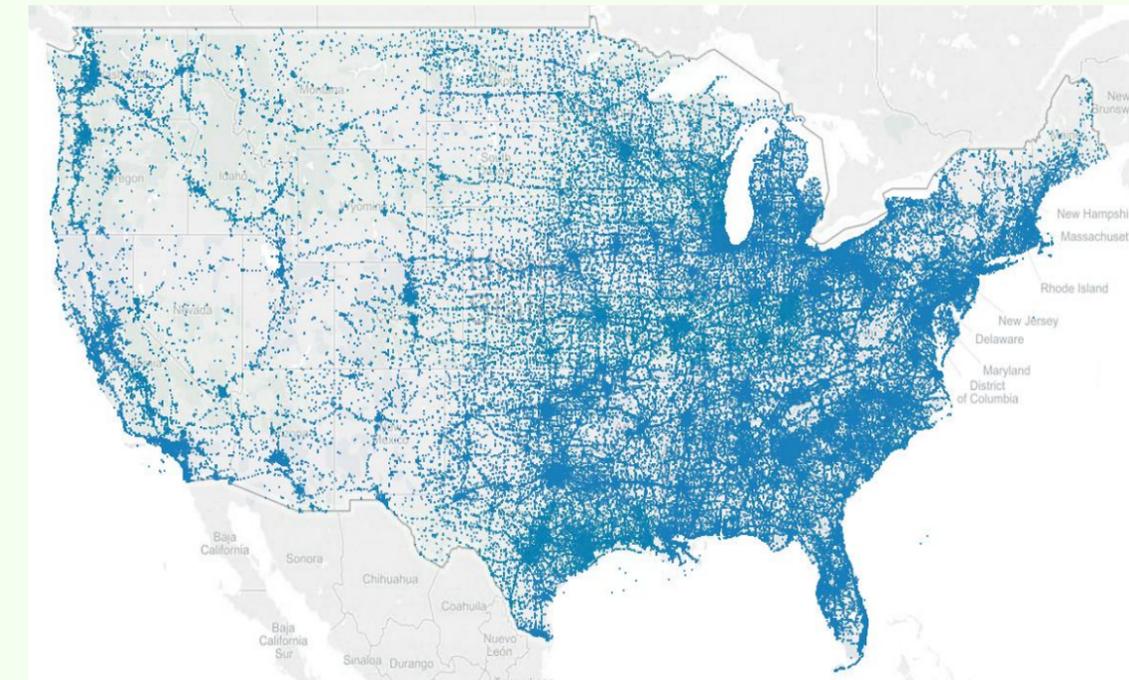
- Mood
- Memory processing
- Sleep
- Cognition



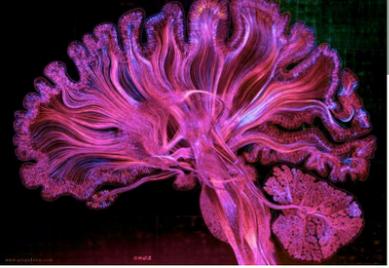
Multiple specialized wiring systems in the World Brain



4G network



Radio



Neurotransmitters in the Human Brain

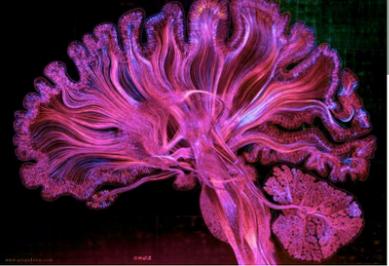
- **Serotonin** regulates mood, sleep and appetite.
- **Dopamine** is the feel good chemical, plays an important role in mood, energy, attitude, motivation.
- **GABA** acts as calming neurotransmitter, helping to relax.
- **Acetylcholine** for processing information and memory.
- **Norepinephrine** - alertness, concentration, energy, anxiety
- **Endorphins** are feel good chemicals our bodies release under extreme pain. They are considered the bodies own opiates.



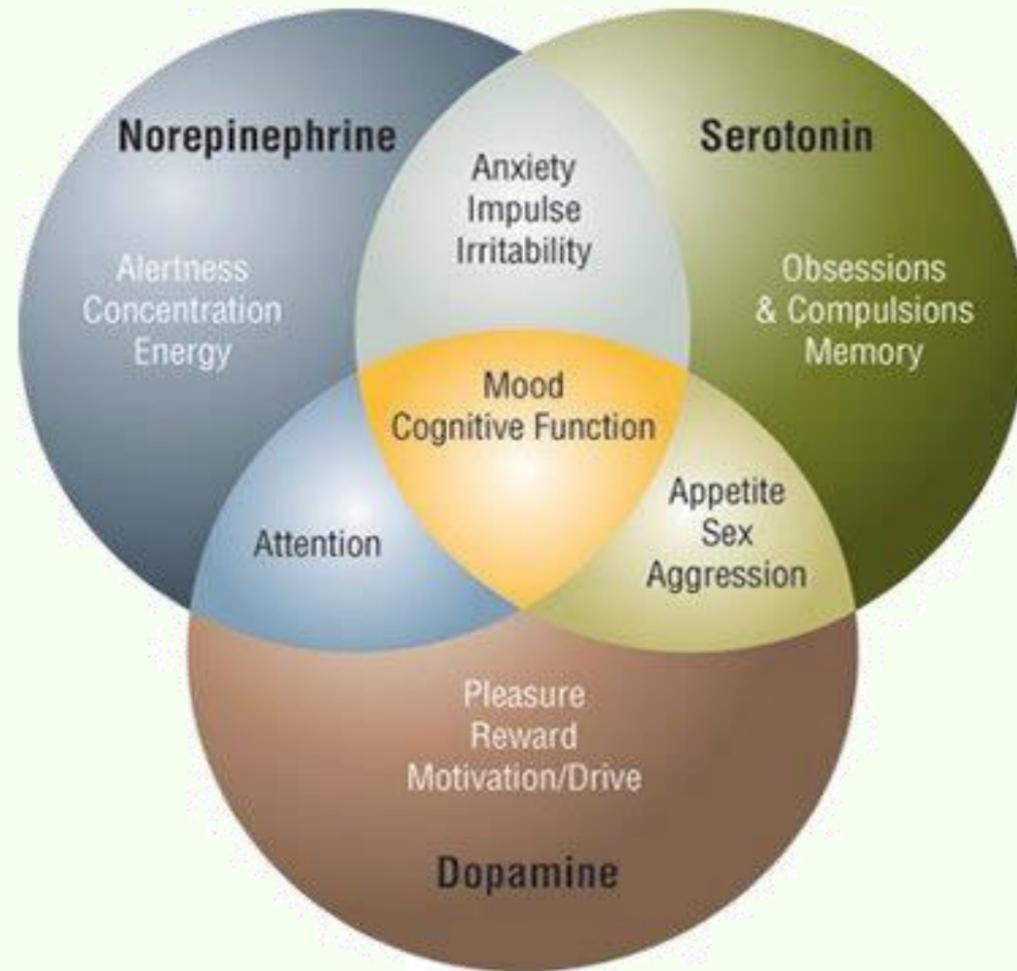
Neurotransmitters in the World Brain

- Telegraph 1767
- Electrical Communication: 1800s
- Trans-Oceanic Cables: 1860s
- Telephones 1876
- Radio 1881
- TV 1897
- Wireless communication 1910





Neurotransmitters in the Human Brain

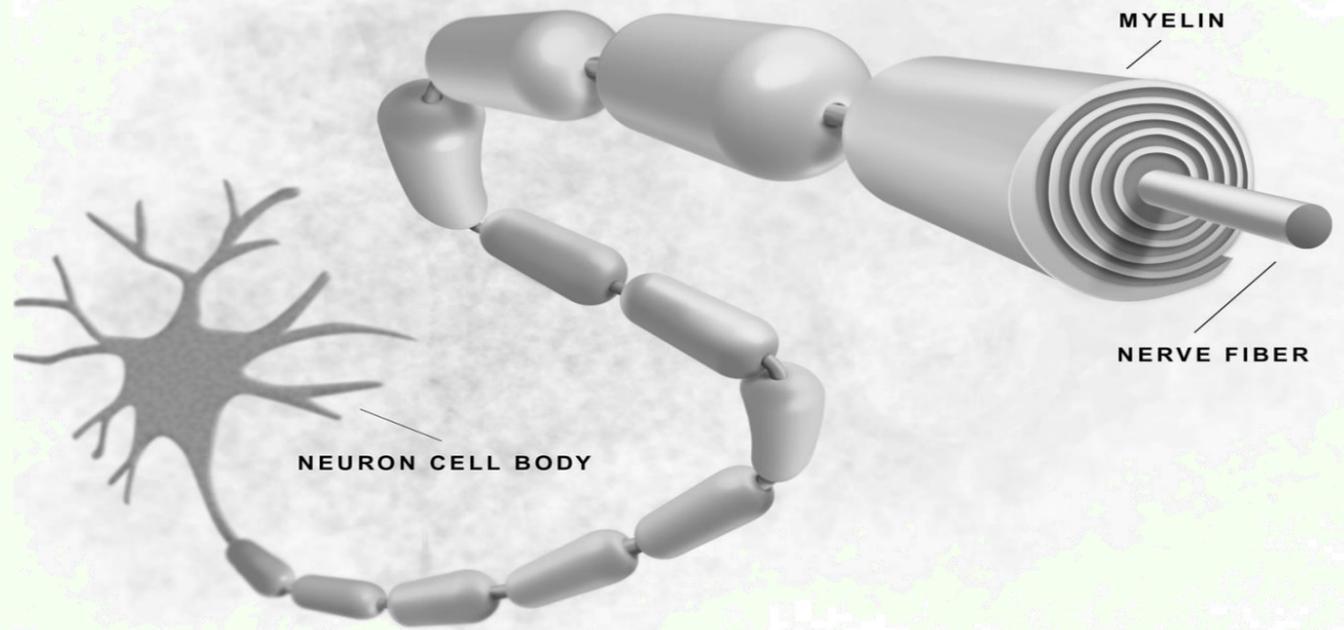
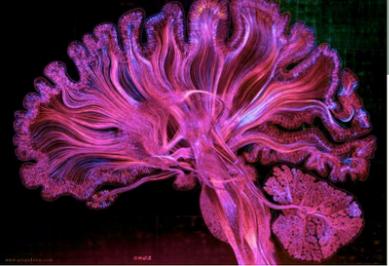


Neurotransmitters in the World Brain

Evolution of Communication



5.b. Increased speed of transmission



✓ Speed of transmission in myelinated neurons – 150 m/sec

VS

✓ Speed of transmission of the World Brain – 300.000 km/sec



Evolution of internet communication speed

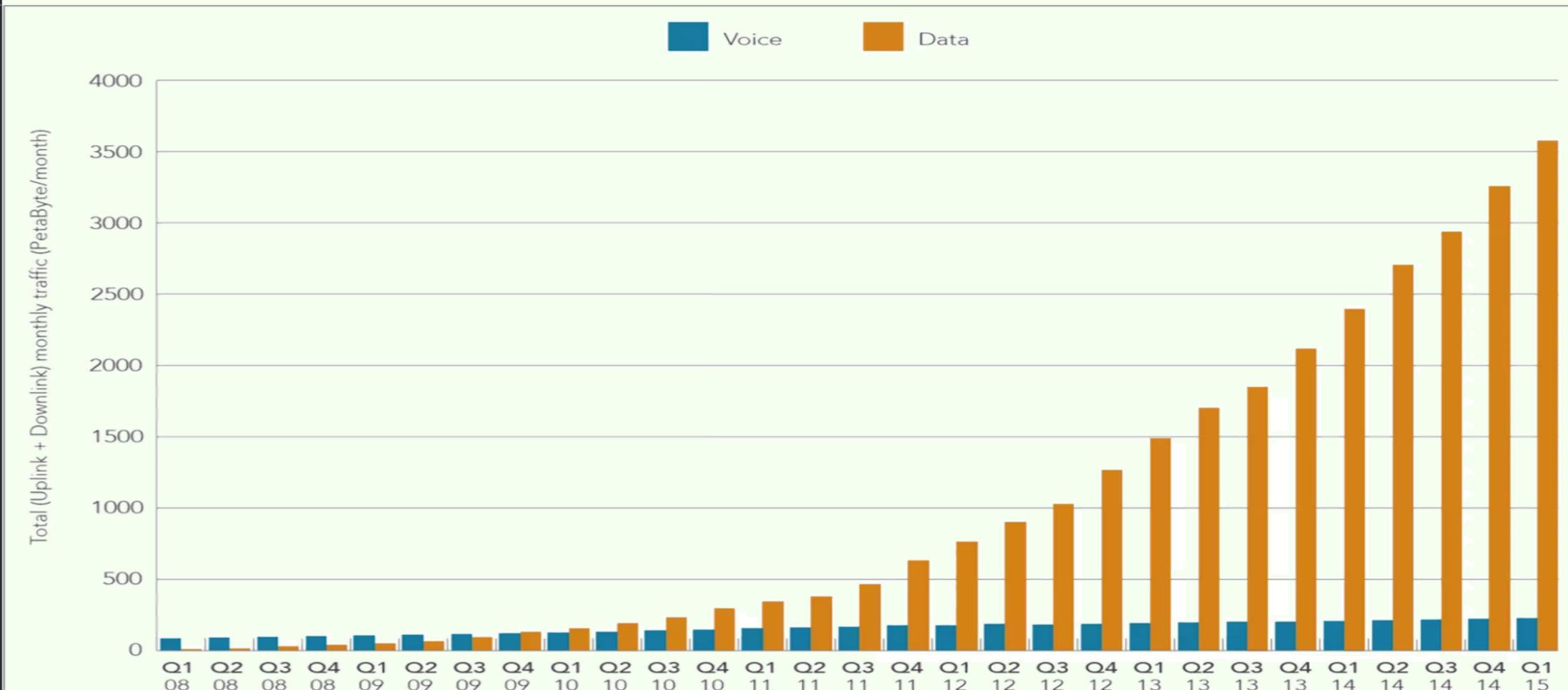


Figure 36: Total Monthly Mobile Voice and Data Traffic as Measured by Ericsson

5.c. Increased wiring system hook-up to neurons
(Homo Sapiens)



We compare it to...

Development of synaptic connections in human brain

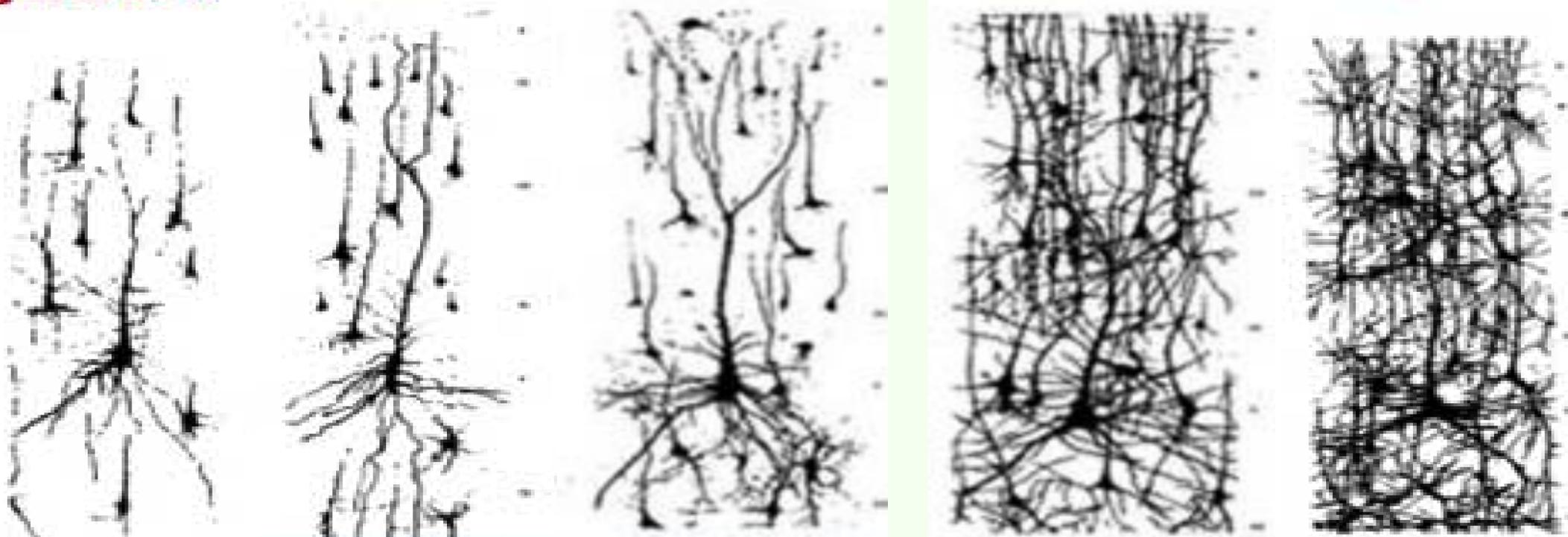
36 weeks gestation

Newborn

3 months

6 months

2 years



Development of communications between humans



Telegraph

Landlines

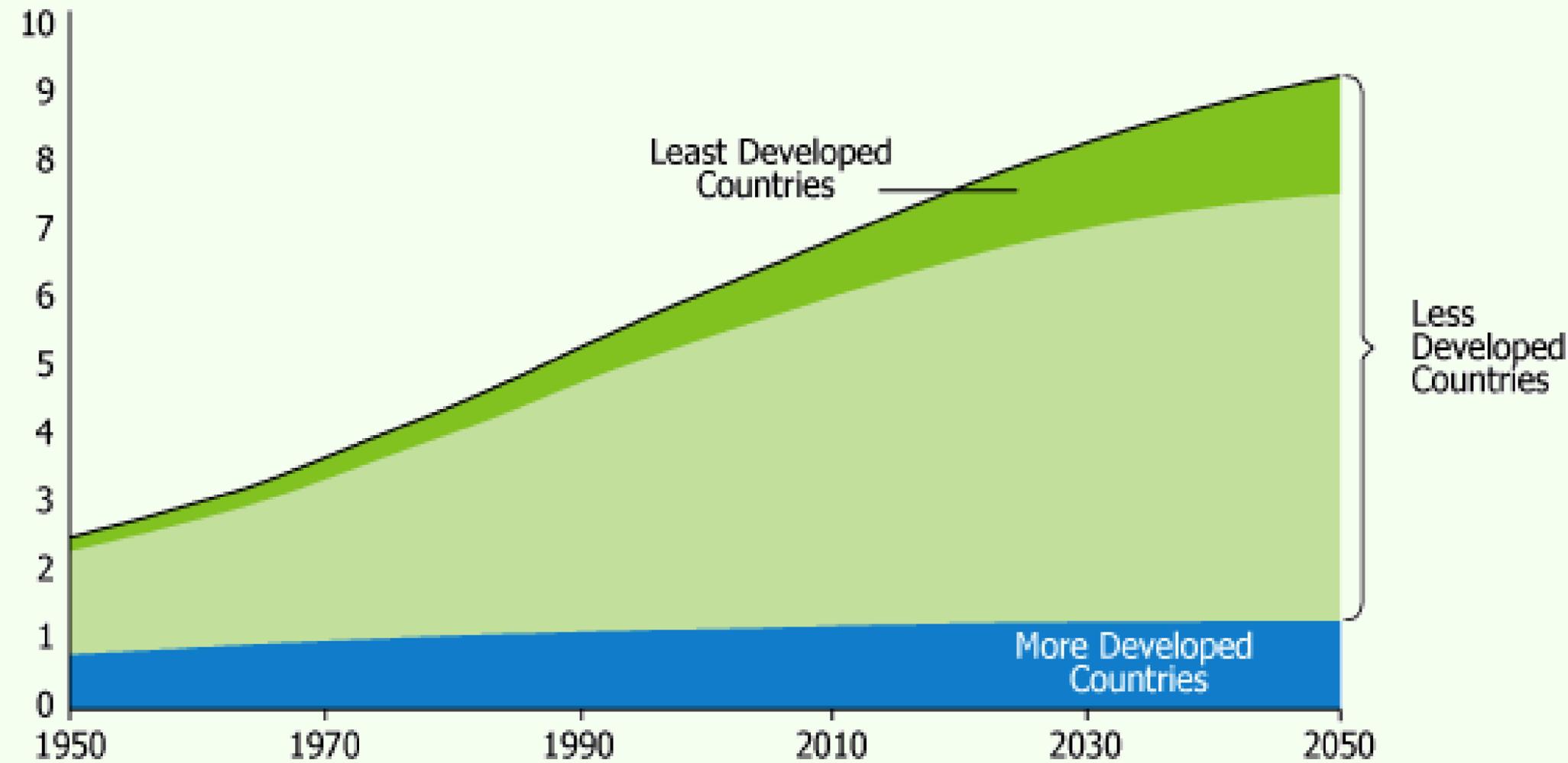
Radio

TV

Internet



Population (billions)



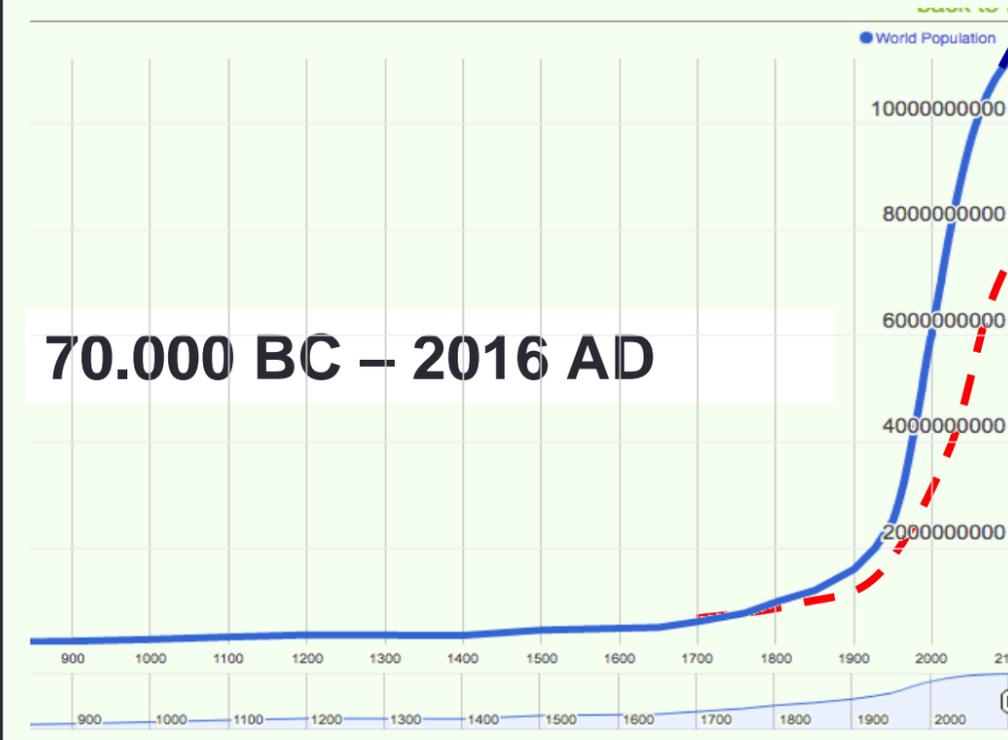
Less Developed Countries



World Brain – Homo Sapiens population

World Population: Past, Present, and Future

(move and expand the bar at the bottom of the chart to navigate through time)



70.000 BC – 2016 AD

Less developed world

1. Connection of China and India
2. Participation of women
3. Improved health
4. No more coal miners
5. Literacy
6. Numeracy

6. Localization

- a. Migration
- b. Few examples of localization

6.a. Migration of neurons (Homo Sapiens)

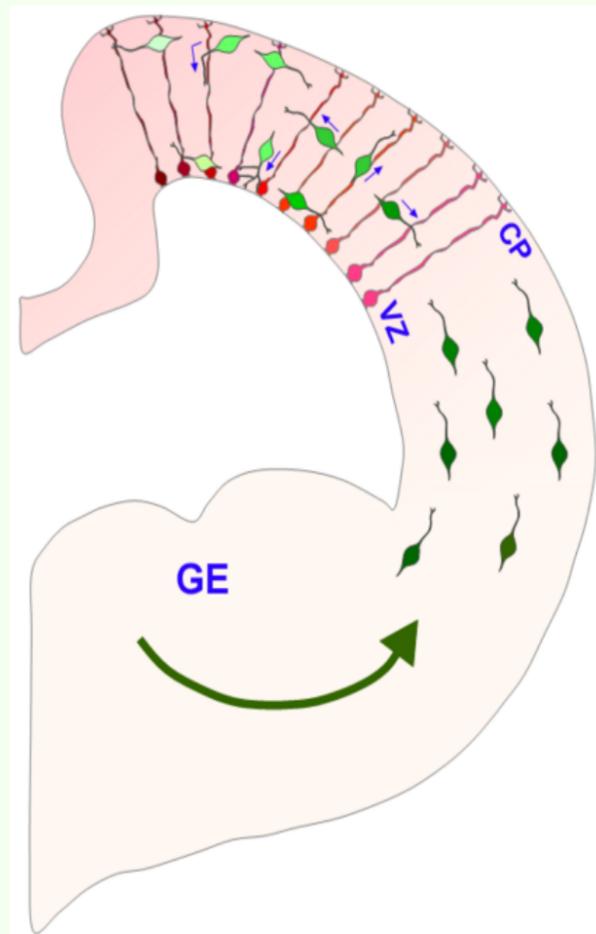


Human brain

Neurogenesis – Neuronal migration

Migration of neurons to reach their appropriate location in the cortex

- Radial migration
- Tangential migration
- Axophilic migration

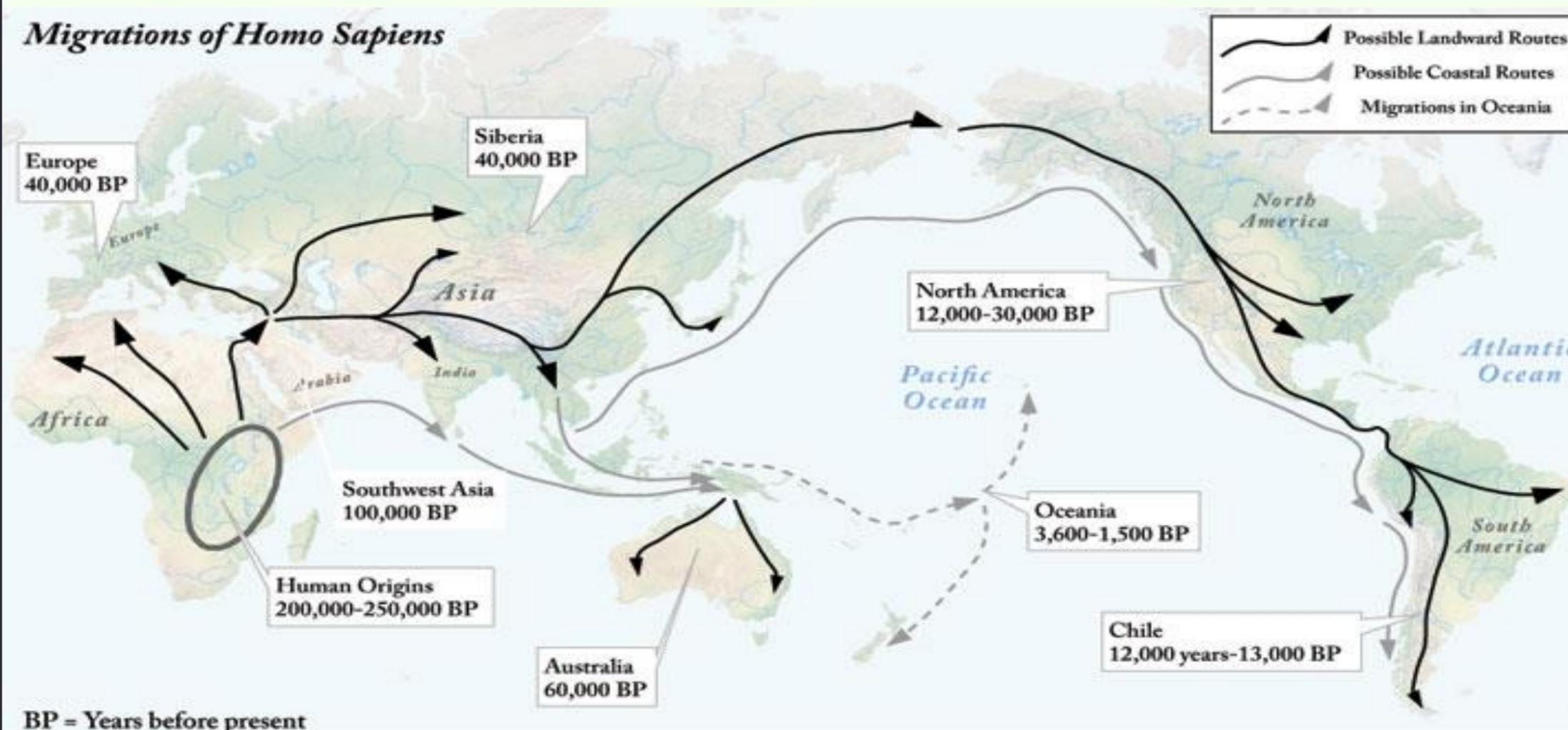


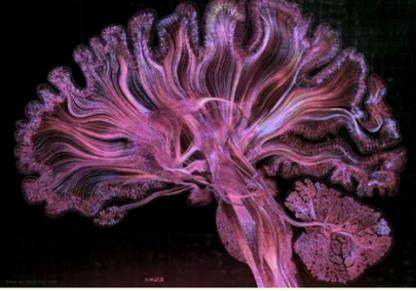
Tangential migration of interneurons from ganglionic eminence



World brain

Migration of Homo Sapiens

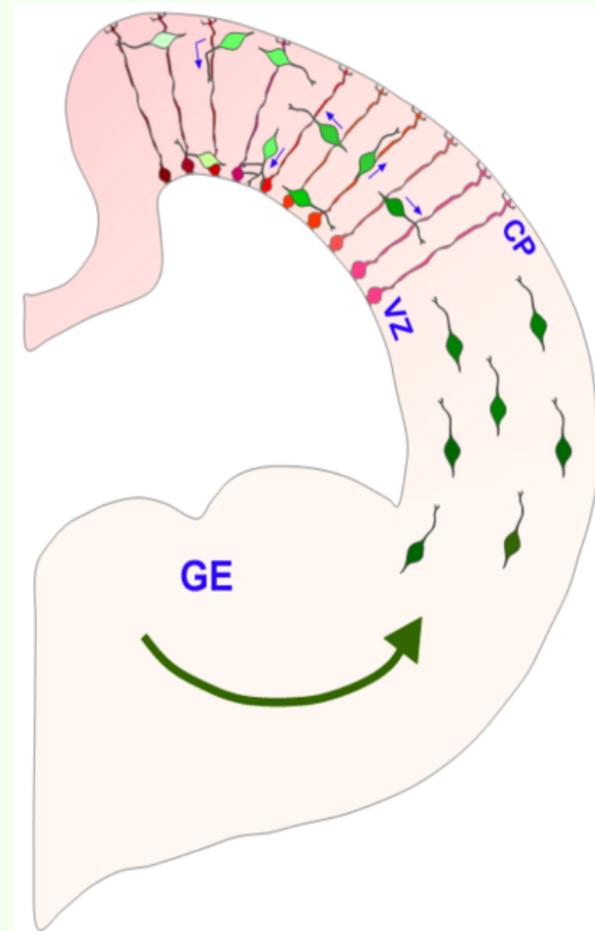




Human brain Neurogenesis – Neuronal migration

Migration of neurons to reach their appropriate location in the cortex

- Radial migration
- Tangential migration
- Axophilic migration



Tangential migration of interneurons from ganglionic eminence

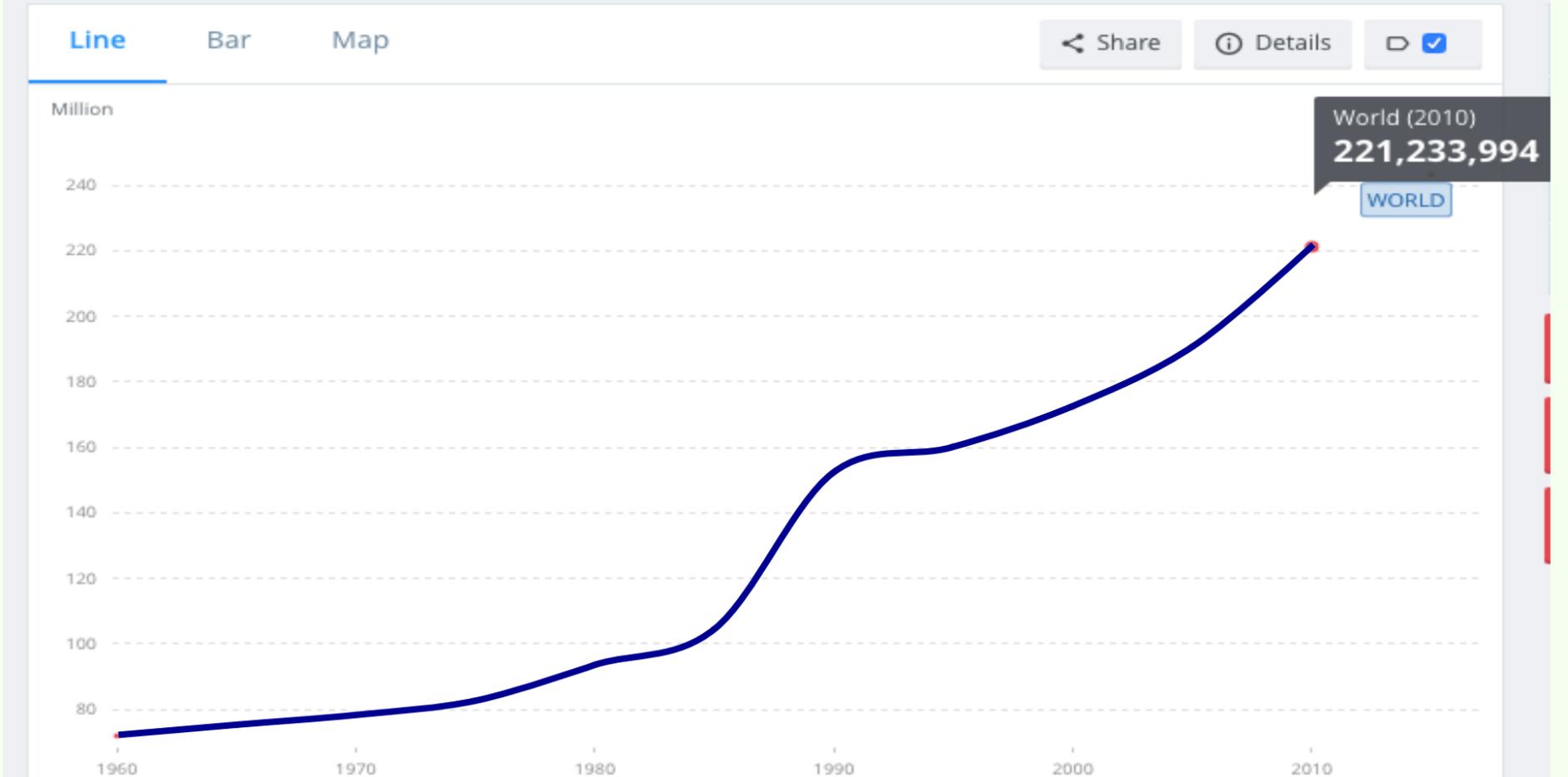


International migration: world data



United Nations Population Division, Trends in Total Migrant Stock: 2012 Revision.

License: [Open](#)



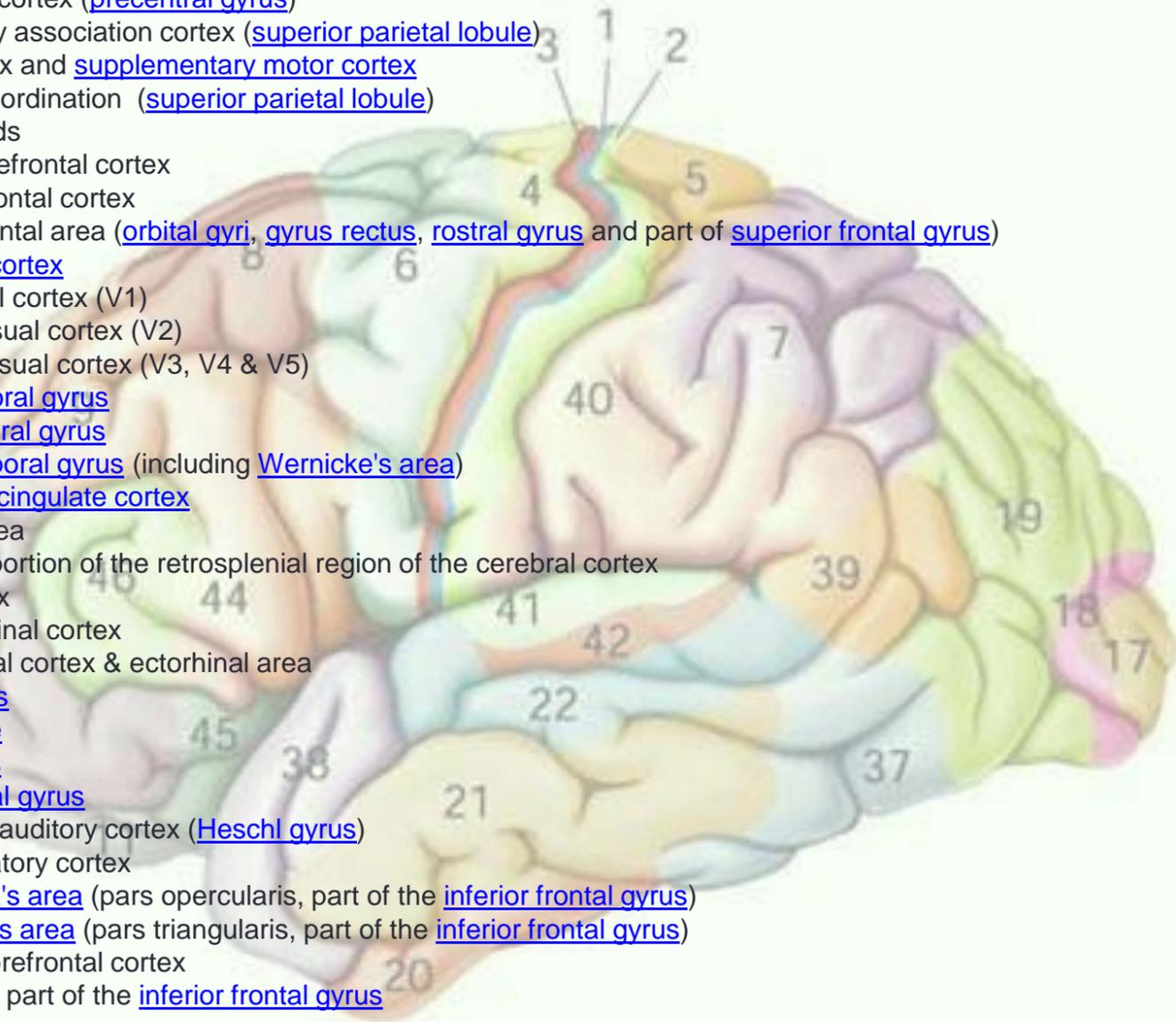


6.b.Examples of localization



Brodmann's areas of neuronal specialization

- Brodmann areas 1, 2 & 3: primary somatosensory cortex ([postcentral gyrus](#))
- Brodmann area 4: primary motor cortex ([precentral gyrus](#))
- Brodmann area 5: somatosensory association cortex ([superior parietal lobule](#))
- Brodmann area 6: premotor cortex and [supplementary motor cortex](#)
- Brodmann area 7: visuo-motor coordination ([superior parietal lobule](#))
- Brodmann area 8: frontal eye fields
- Brodmann area 9: dorsolateral prefrontal cortex
- Brodmann area 10: anterior prefrontal cortex
- Brodmann area 11 & 12: orbitofrontal area ([orbital gyri](#), [gyrus rectus](#), [rostral gyrus](#) and part of [superior frontal gyrus](#))
- Brodmann area 13 & 16: [insular cortex](#)
- Brodmann area 17: primary visual cortex (V1)
- Brodmann area 18: secondary visual cortex (V2)
- Brodmann area 19: associative visual cortex (V3, V4 & V5)
- Brodmann area 20: [inferior temporal gyrus](#)
- Brodmann area 21: [middle temporal gyrus](#)
- Brodmann area 22: [superior temporal gyrus](#) (including [Wernicke's area](#))
- Brodmann area 23, 24, 28 to 33: [cingulate cortex](#)
- Brodmann area 25: subgenual area
- Brodmann area 26: ectosplenial portion of the retrosplenial region of the cerebral cortex
- Brodmann area 27: piriform cortex
- Brodmann area 34: dorsal entorhinal cortex
- Brodmann area 35 & 36: perirhinal cortex & entorhinal area
- Brodmann area 37: [fusiform gyrus](#)
- Brodmann area 38: [temporal pole](#)
- Brodmann area 39: [angular gyrus](#)
- Brodmann area 40: [supramarginal gyrus](#)
- Brodmann area 41 & 42: primary auditory cortex ([Heschl gyrus](#))
- Brodmann area 43: primary gustatory cortex
- Brodmann area 44: part of [Broca's area](#) (pars opercularis, part of the [inferior frontal gyrus](#))
- Brodmann area 45: part of [Broca's area](#) (pars triangularis, part of the [inferior frontal gyrus](#))
- Brodmann area 46: dorsolateral prefrontal cortex
- Brodmann area 47: pars orbitalis, part of the [inferior frontal gyrus](#)
- Brodmann area 48: retrosubicular area



World brain specialized neurons - Occupations



Arts and entertainment

- [List of artistic occupations](#)
- [List of dance occupations](#)
- [List of film and television occupations](#)
- [List of theatre personnel](#)
- [List of writing occupations](#)

Business

- [List of corporate titles](#)

Industrial and manufacturing

- [List of industrial occupations](#)
- [List of metalworking occupations](#)
- [List of railway industry occupations](#)

- [List of sewing occupations](#)

Law Enforcement and Armed Forces

- [List of Law enforcement occupations](#)
- [List of military occupations](#)

Science and technology

- [List of computer occupations](#)
- [List of scientific occupations](#)

Healthcare and medicine

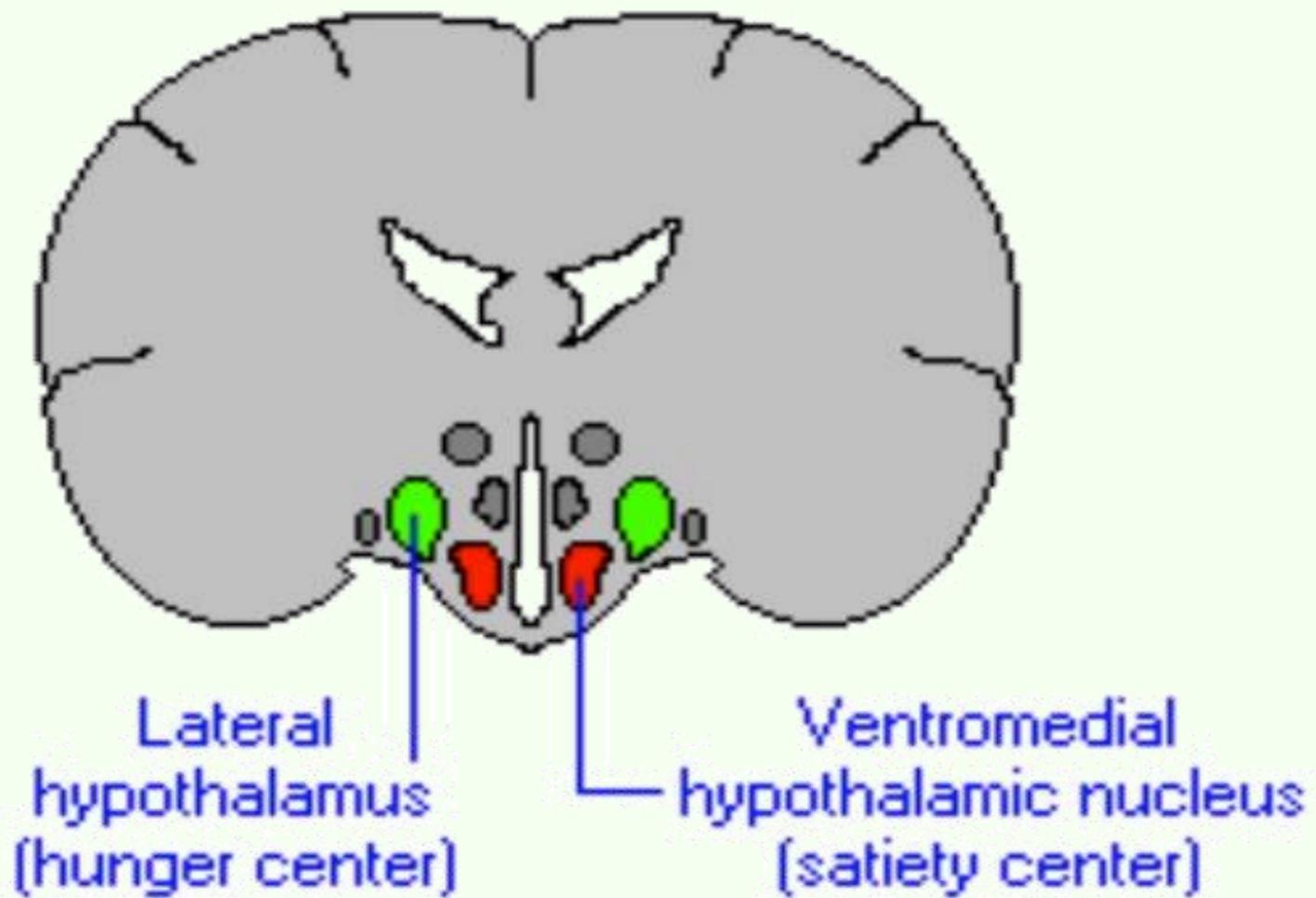
- [List of healthcare occupations](#)
- [List of mental health occupations](#)
- [List of nursing specialties](#)

Service

- [List of professional driver types](#)



Hunger and satiety centers

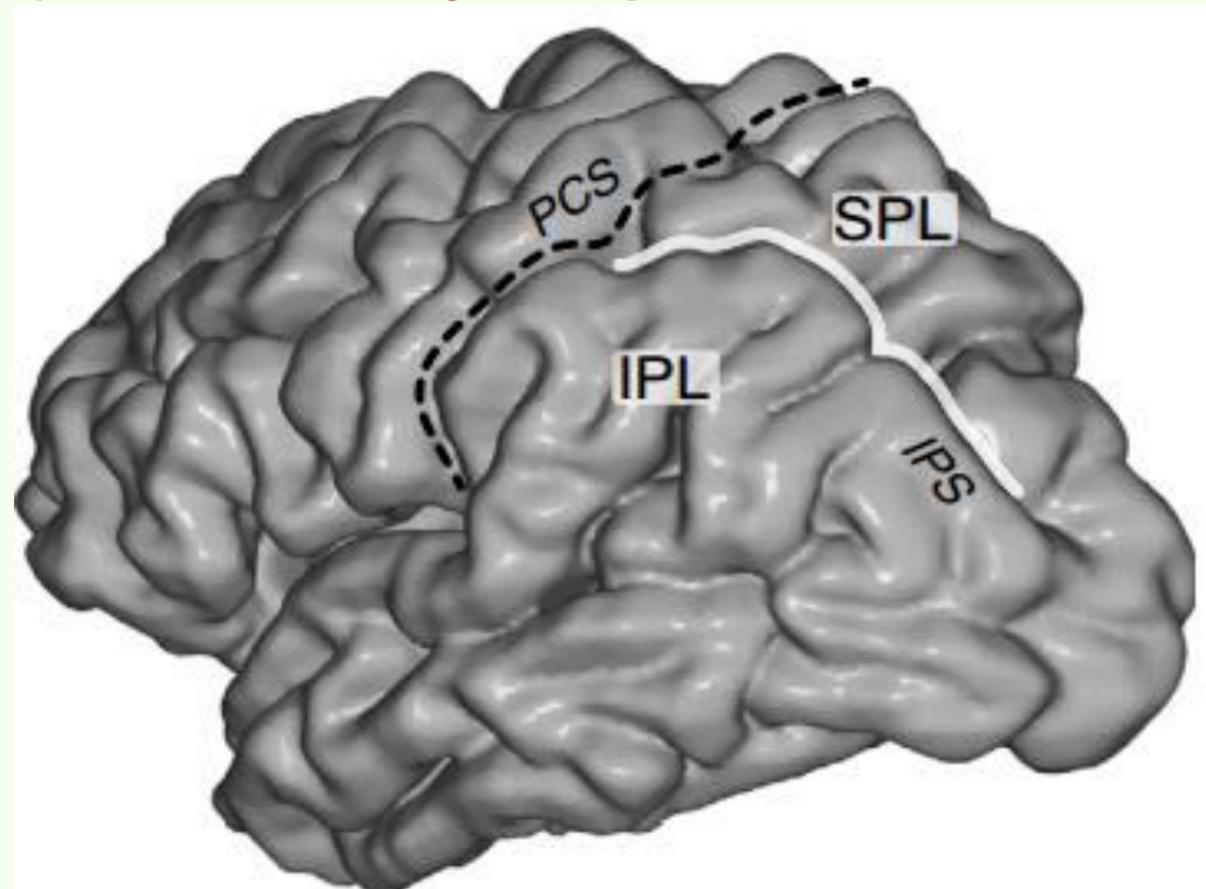


Agriculture





Area of mathematical thinking
(studied by implanted electrodes)



Intraparietal sulcus region of the brain (white line)
(credit: Mohammad Dastjerdi et al./Nature Communications)



Artificial intelligence



IBM Supercomputer

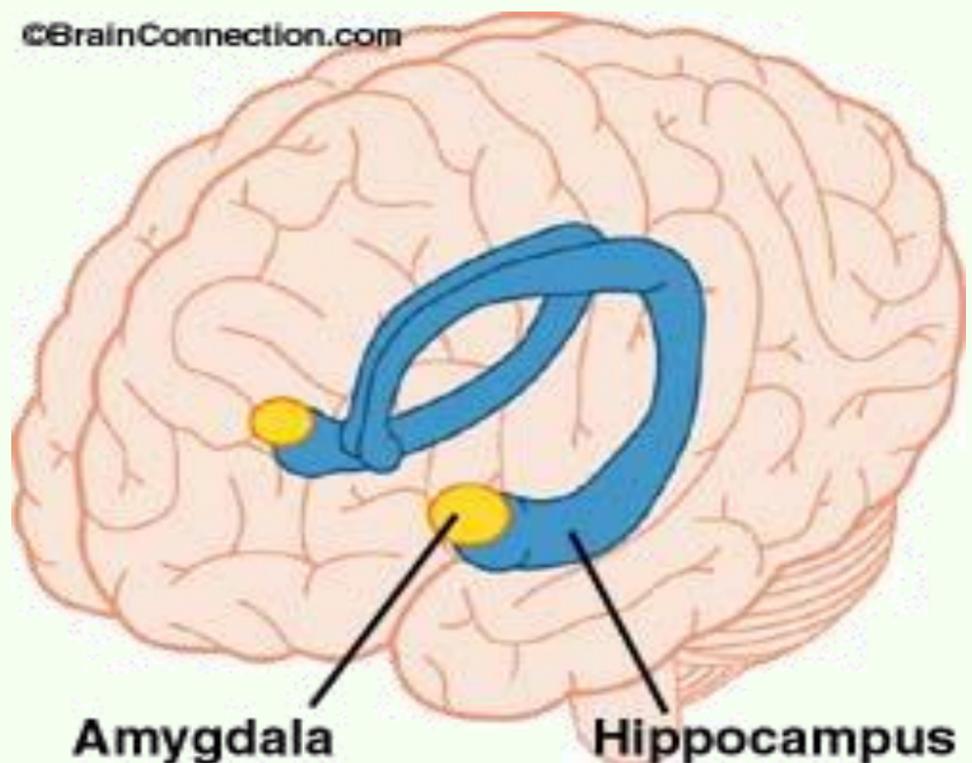
7. System integration

Memory formation and retrieval



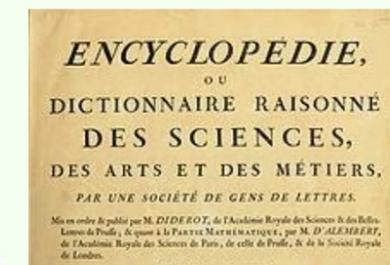
We compare it to...

...evolution of amygdala and Hippocampus



Evolution of memory formation

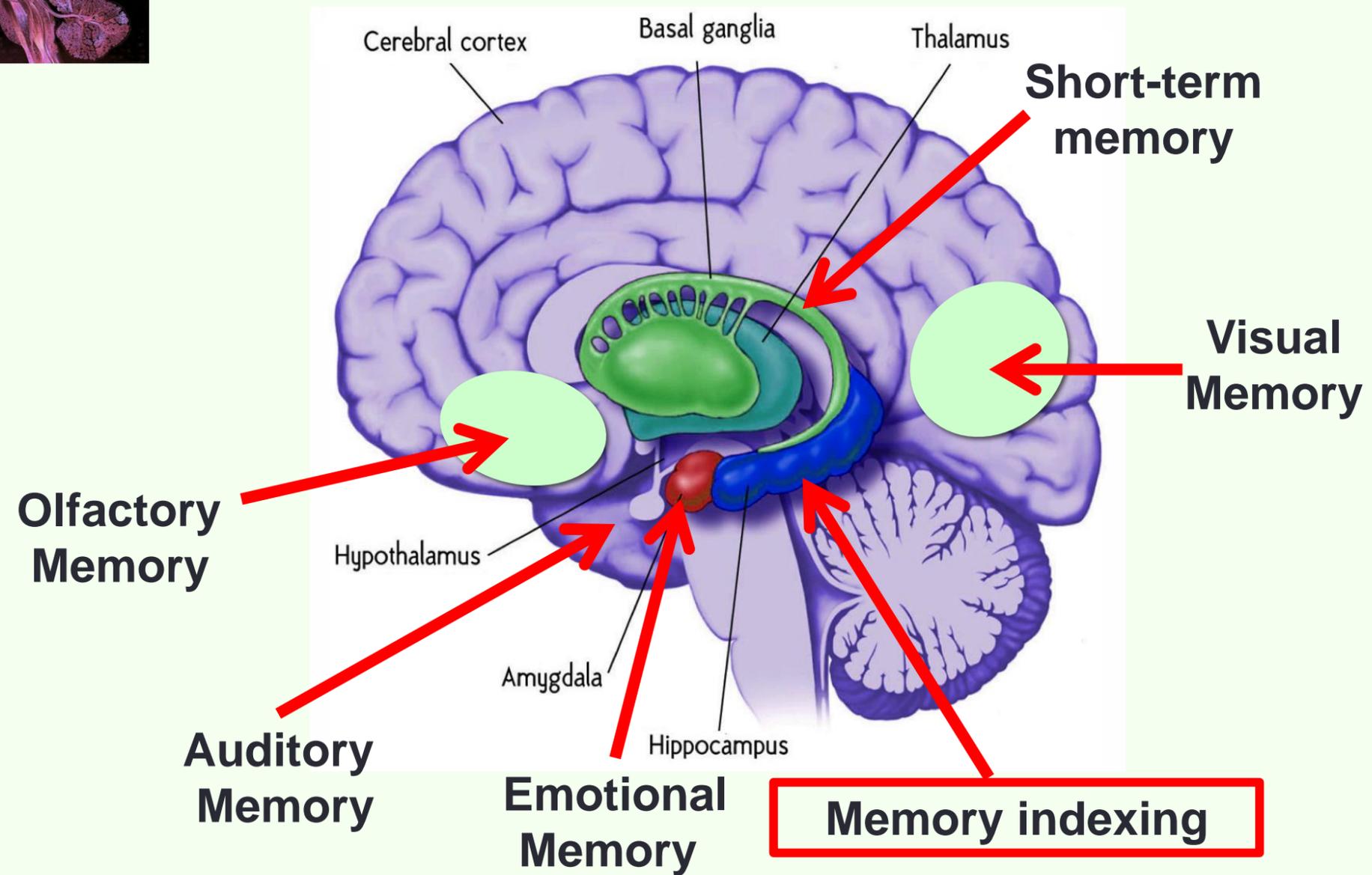
- Library of Alexandria (3rd century BC),
- The Printing Press (1450),
- First encyclopedia (1728)
- Computers: (1980s)
- Wikipedia (2001)



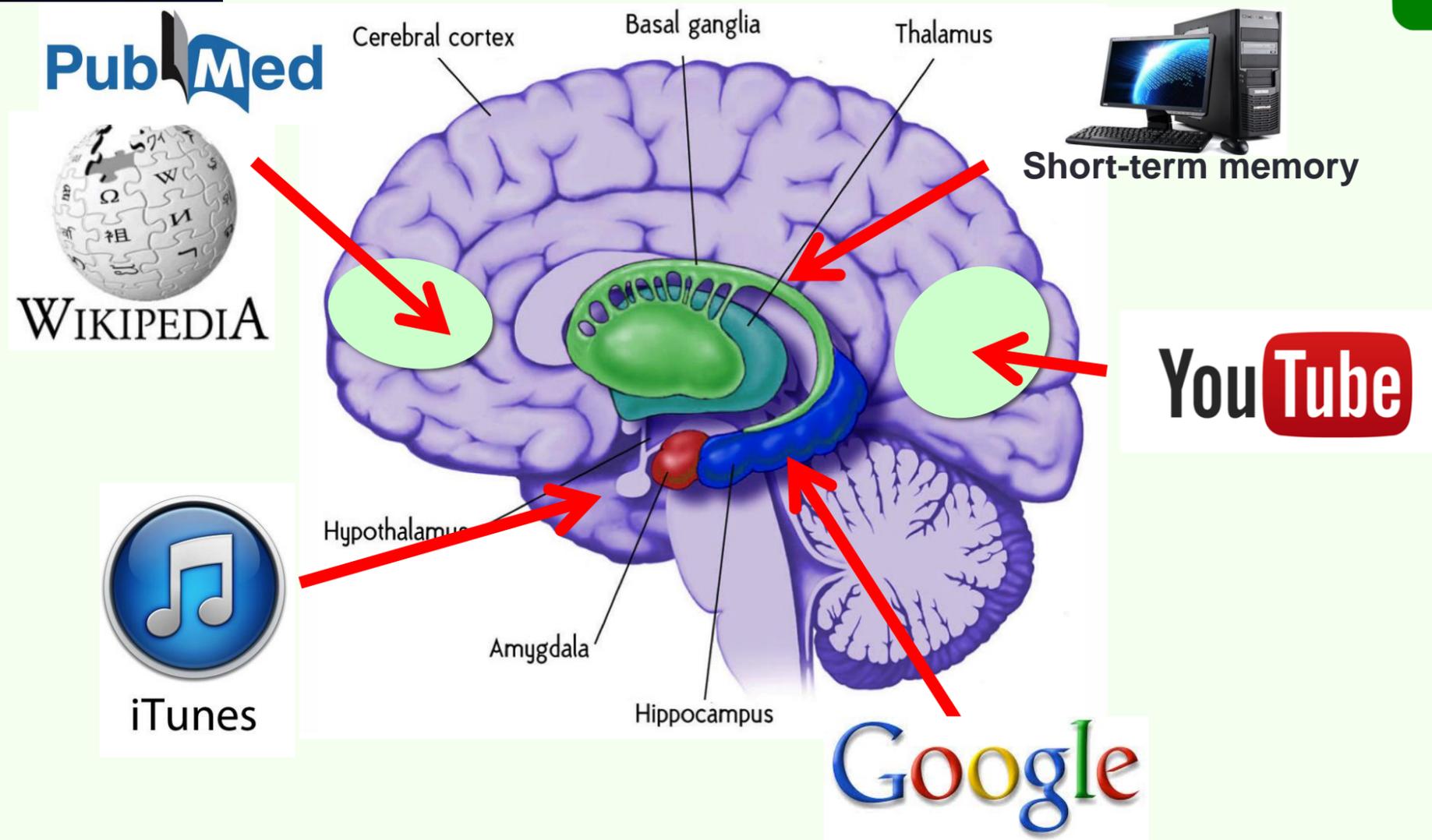
WIKIPEDIA



Human memory formation



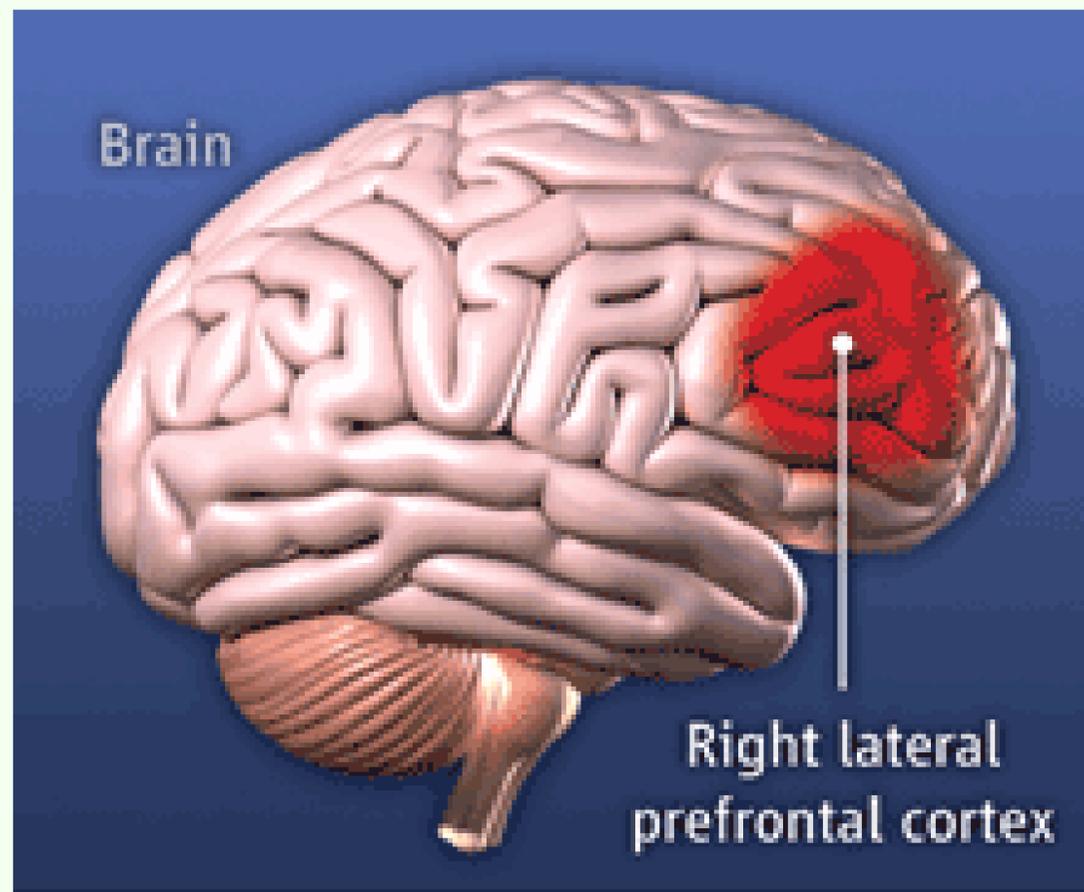
World brain memory formation





We compare it to...

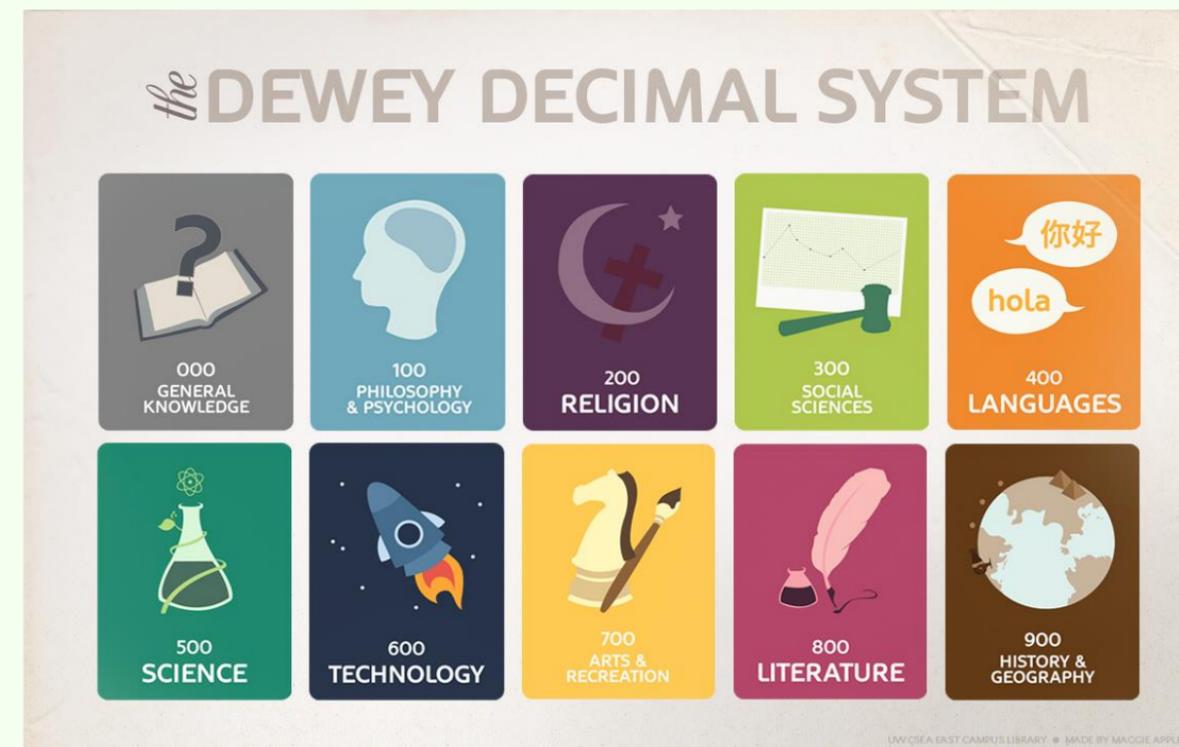
...the major role of the right prefrontal cortex in memory retrieval

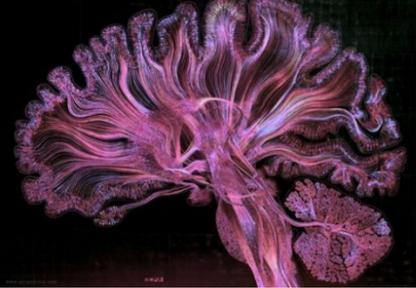


Evolution of memory retrieval



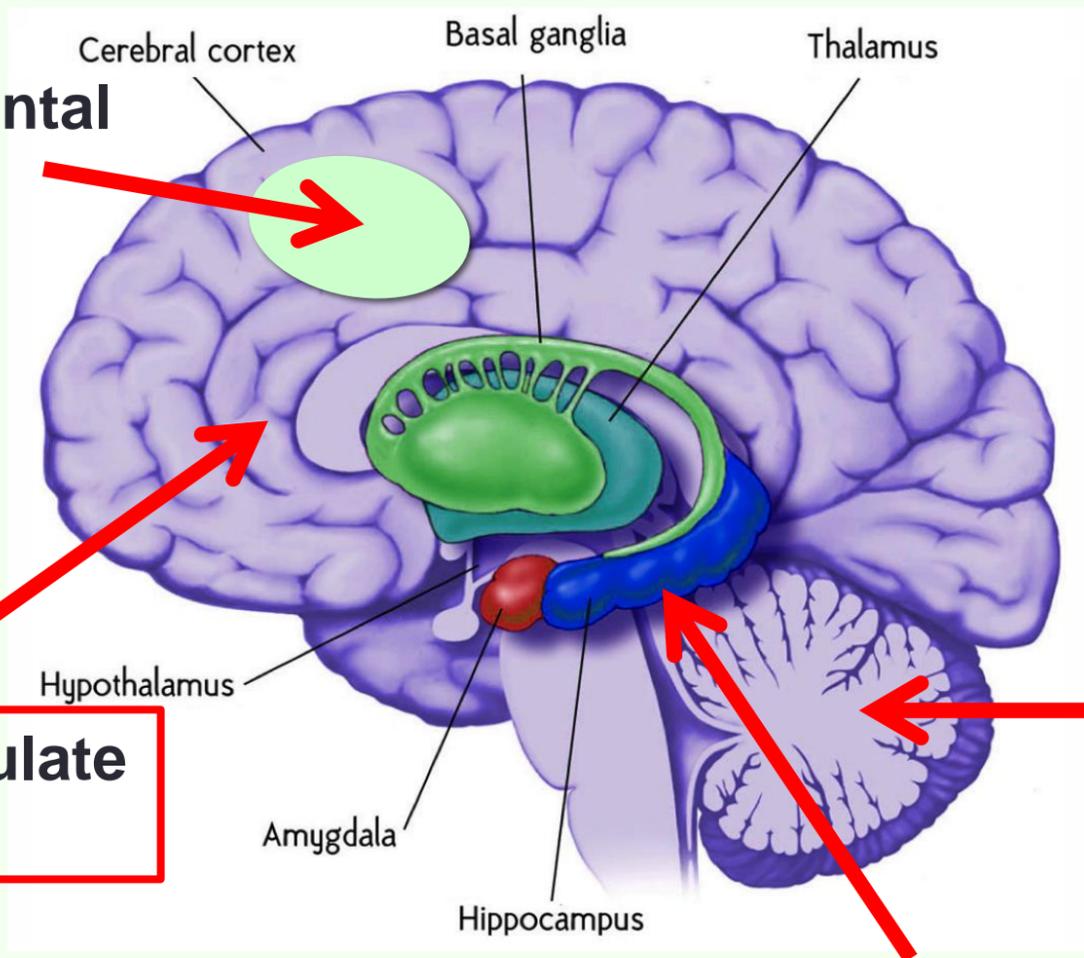
- Dewey decimal system (1876)
- Search Engines (1993)





Willful memory retrieval

Right prefrontal cortex



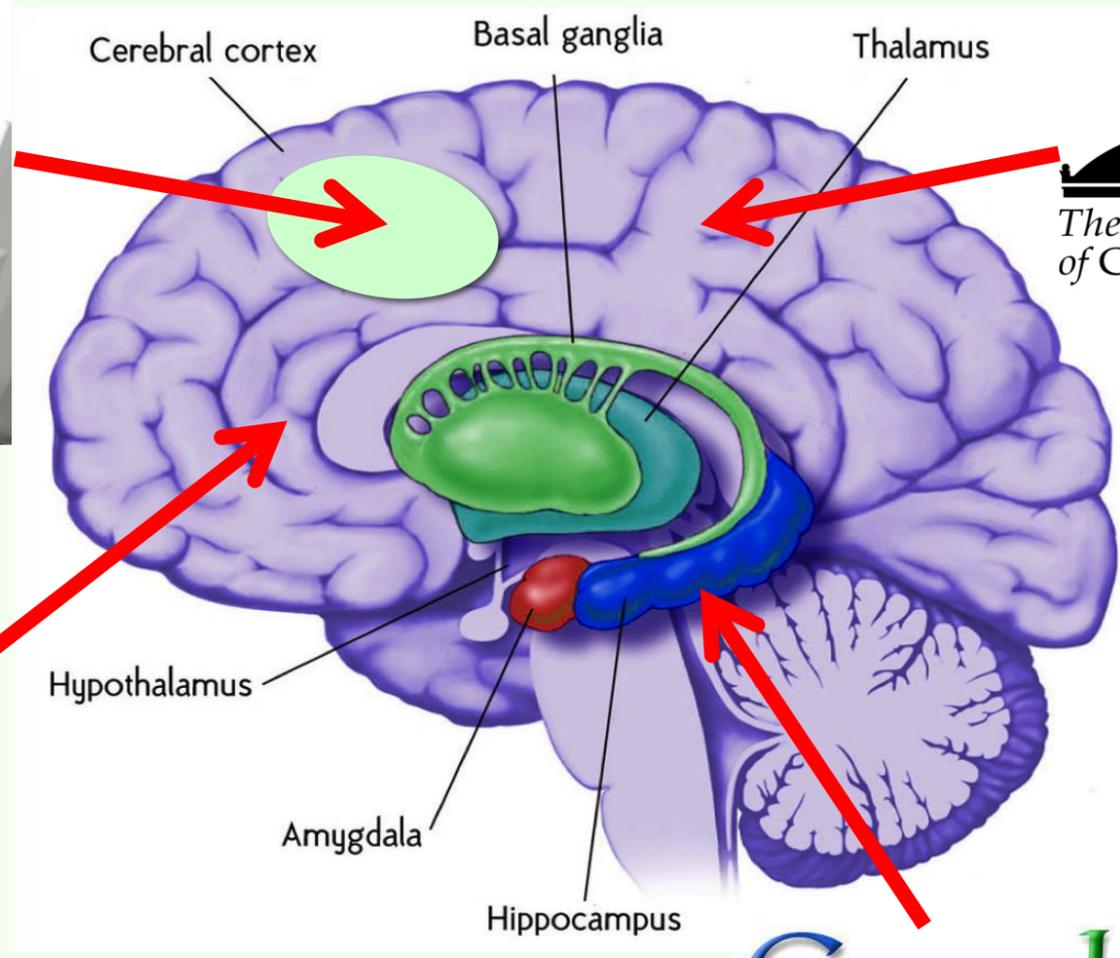
Anterior cingulate cortex

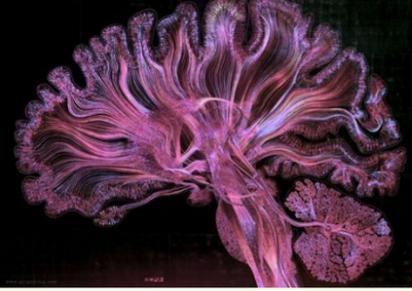
Cerebellum

Memory indexing

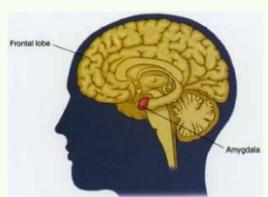
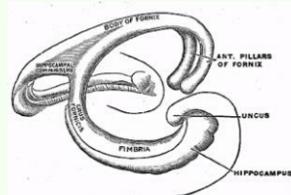
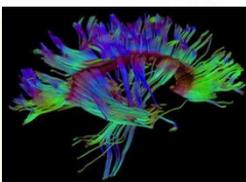
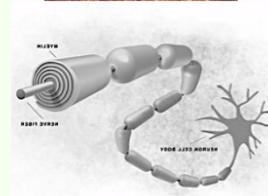
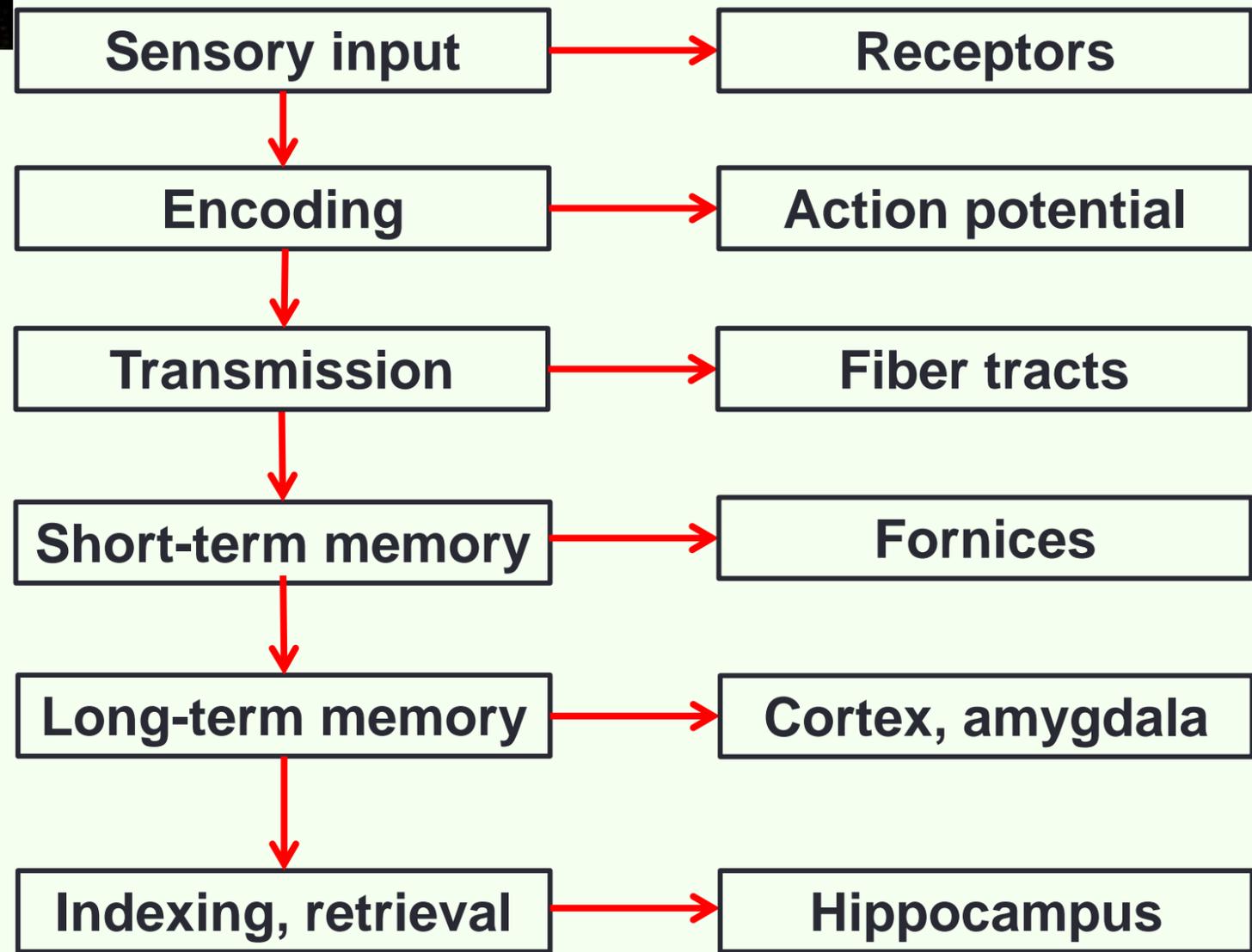


Willful memory retrieval

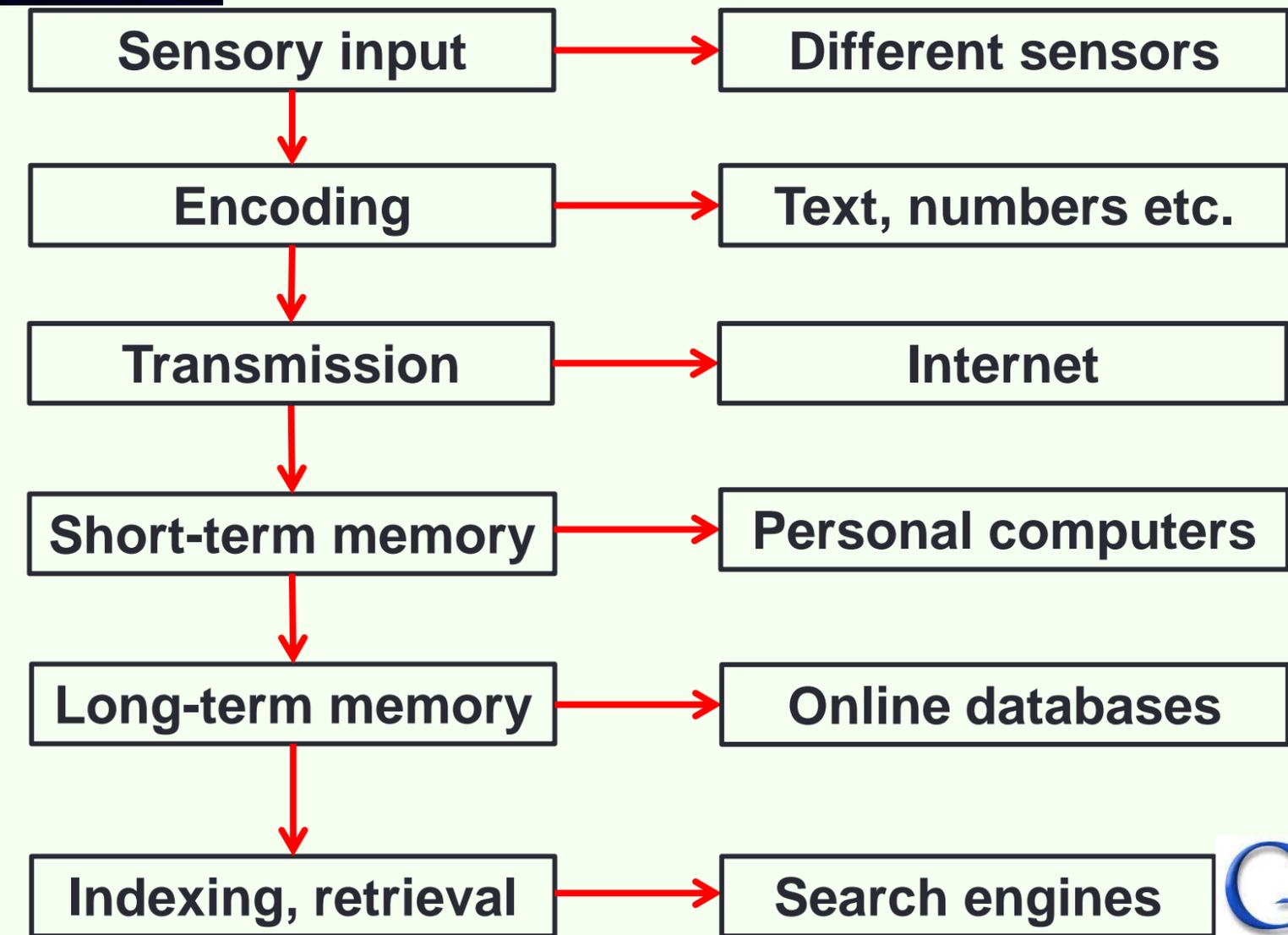




Human memory formation and retrieval



World Brain memory formation and retrieval





Similarly, there is some restriction of memory retrieval in the human brain

1. Psychological repression
2. State-dependent memory
3. Context-dependent memory



Access restriction to memory retrieval

1. Patents
2. Lack of language skills / literacy / numeracy
3. Financial limitations
4. Government restrictions
5. National secrets
6. Private/personal information





The octopus genome and the evolution of cephalopod neural and morphological novelties

Caroline B. Albertin^{1*}, Oleg Simakov^{2,3*}, Therese Mitros⁴, Z. Yan Wang⁵, Judit R. Pungor⁵, Eric Edsinger-Gonzales^{2,4}, Sydney Brenner², Clifton W. Ragsdale^{1,5} & Daniel S. Rokhsar^{2,4,6}

Coleoid cephalopods (octopus, squid and cuttlefish) are active, resourceful predators with a rich behavioural repertoire¹. They have the largest nervous systems among the invertebrates² and present other striking morphological innovations including camera-like eyes, prehensile arms, a highly derived early embryogenesis and a remarkably sophisticated adaptive colouration system^{1,3}. To investigate the molecular bases of cephalopod brain and body innovations, we sequenced the genome and multiple transcriptomes of the California two-spot octopus, *Octopus bimaculoides*. We found no evidence for hypothesized whole-genome duplications in the octopus lineage⁴⁻⁶. The core developmental and neuronal gene repertoire of the octopus is broadly similar to that found across invertebrate bilaterians, except for massive expansions in two gene families previously thought to be uniquely enlarged in vertebrates: the protocadherins, which regulate neuronal development, and the C2H2 superfamily of zinc-finger transcription factors. Extensive messenger RNA editing generates transcript and protein diversity in genes involved in neural excitability, as previously described⁷, as well as in genes participating in a broad range of other cellular functions. We identified hundreds of cephalopod-specific genes, many of which showed elevated expression levels in such specialized structures as the skin, the suckers and the nervous system. We also found evidence for large-scale genomic rearrangements, including a 1.5-Mb inversion on chromosome 10. Finally, we identified a large number of genes that are highly expressed in the nervous system, including many that are enriched in the brain. Our findings provide a comprehensive view of the octopus genome and its evolution, and highlight the unique adaptations that have enabled cephalopods to become successful predators in a diverse range of marine environments.

97% of expressed protein-coding genes and 83% of the estimated 2.7 gigabase (Gb) genome size (Methods and Supplementary Notes 1-3). The unassembled fraction is dominated by high-copy repetitive sequences (Supplementary Note 1). Nearly 45% of the assembled genome is composed of repetitive elements, with two bursts of transposon activity occurring ~25-million and ~56-million years ago (Mya) (Supplementary Note 4).

We predicted 33,638 protein-coding genes (Methods and Supplementary Note 4) and found alternate splicing at 2,819 loci, but no locus showed an unusually high number of splice variants (Supplementary Note 4). A-to-G discrepancies between the assembled genome and transcriptome sequences provided evidence for extensive mRNA editing by adenosine deaminases acting on RNA (ADARs). Many candidate edits are enriched in neural tissues⁷ and are found in a range of gene families, including 'housekeeping' genes such as the tubulins, which suggests that RNA edits are more widespread than previously appreciated (Extended Data Fig. 1 and Supplementary Note 5).

Based primarily on chromosome number, several researchers proposed that whole-genome duplications were important in the evolution of the cephalopod body plan⁴⁻⁶, paralleling the role ascribed to the independent whole-genome duplication events that occurred early in vertebrate evolution¹¹. Although this is an attractive framework for both gene family expansion and increased regulatory complexity

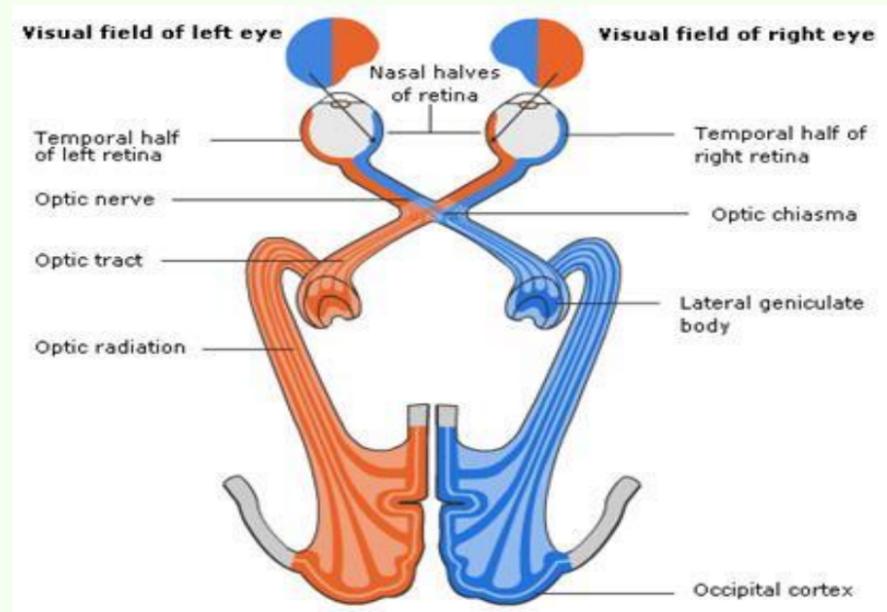
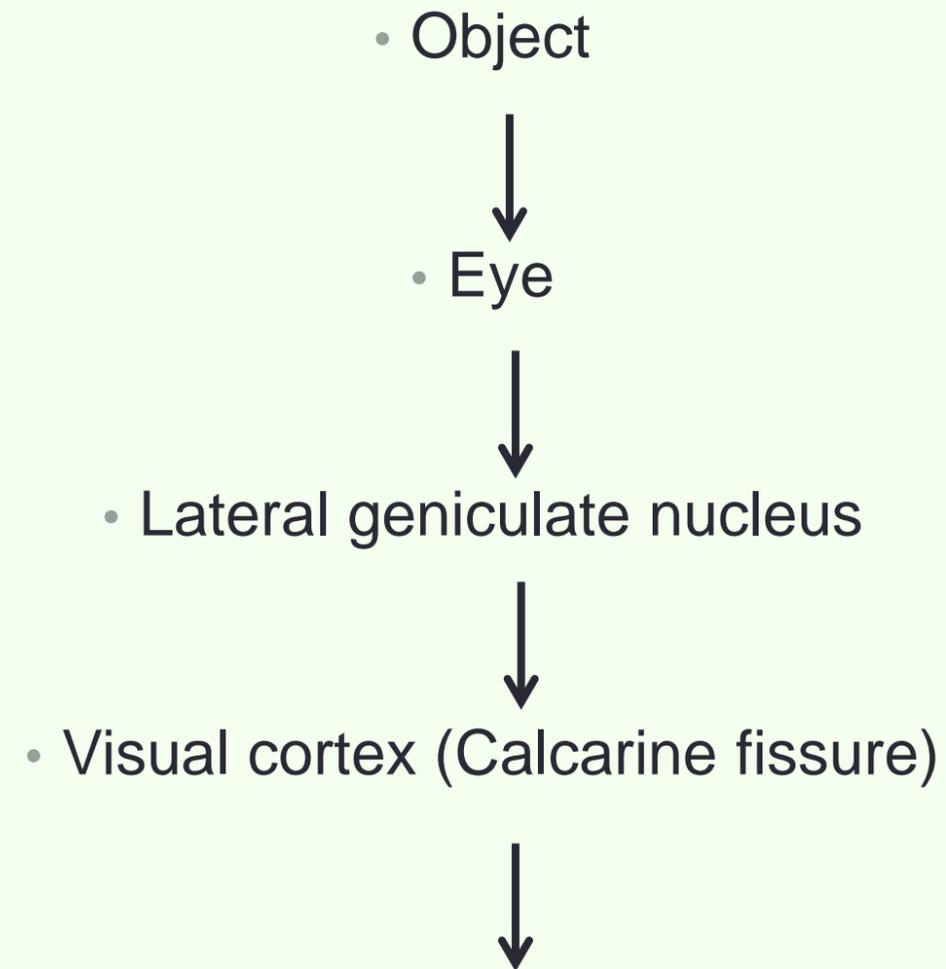
By way of summary

8. A particular example –
a random scientific article from Nature

The creation of this article matches the
structural functionality of the human brain



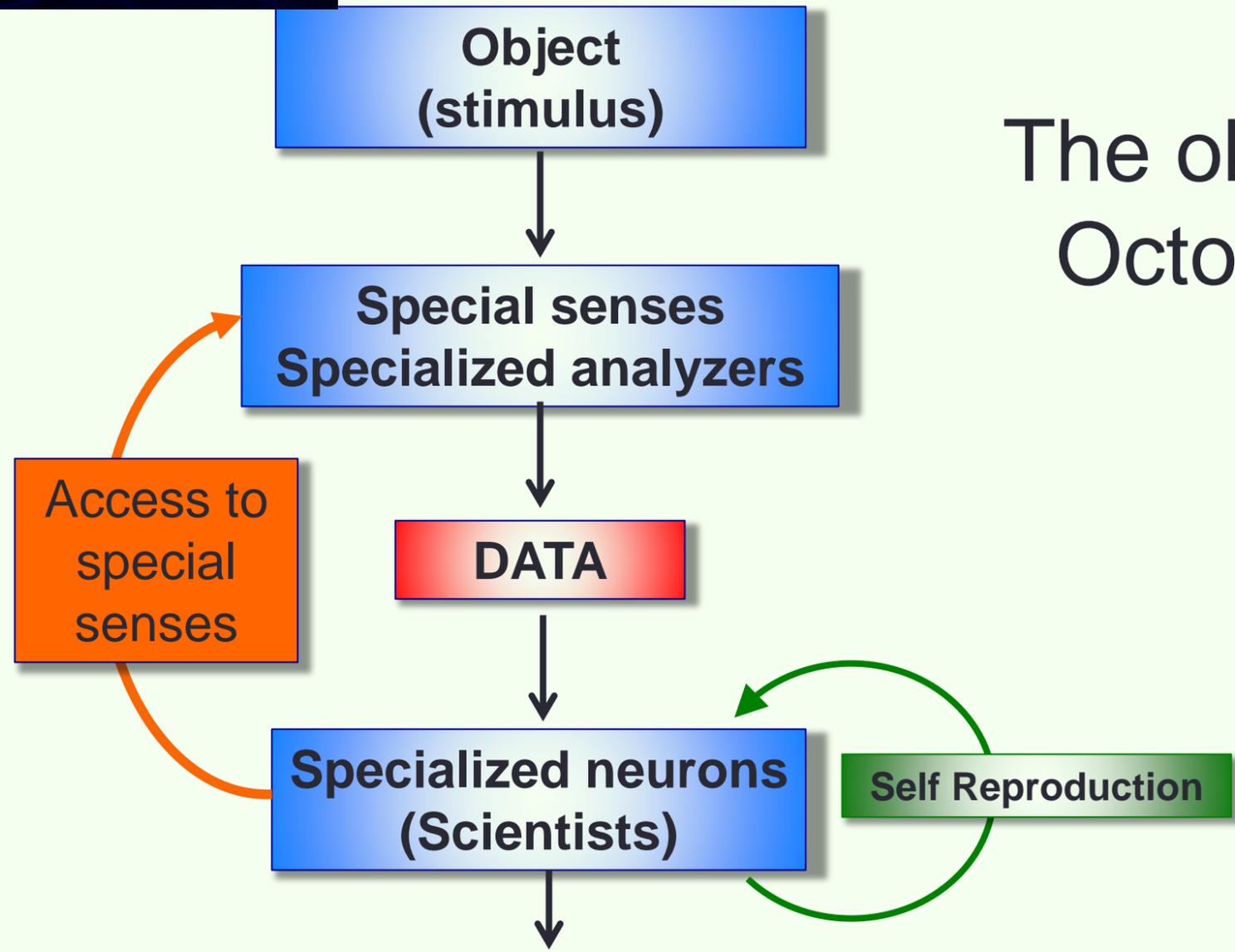
Human Brain



World Brain



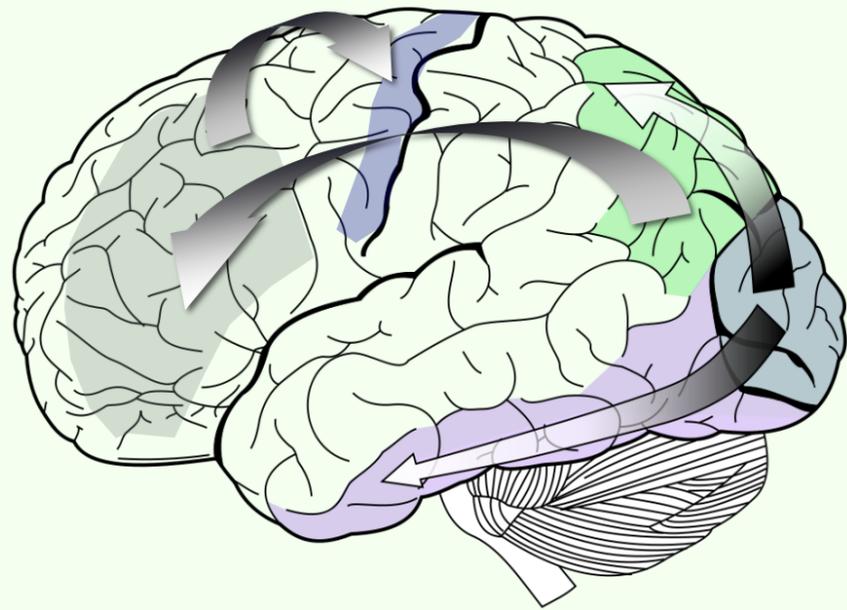
The object is the Octopus DNA





Human Brain (continued...)

- Ventral and the dorsal stream
- Decision making (prefrontal cortex)
- Motor cortex
- Action



Memory



World Brain (continued...)



Specialized neurons (Scientists)

- Encoding
- Decision making

Results

Action

Memory

Speech

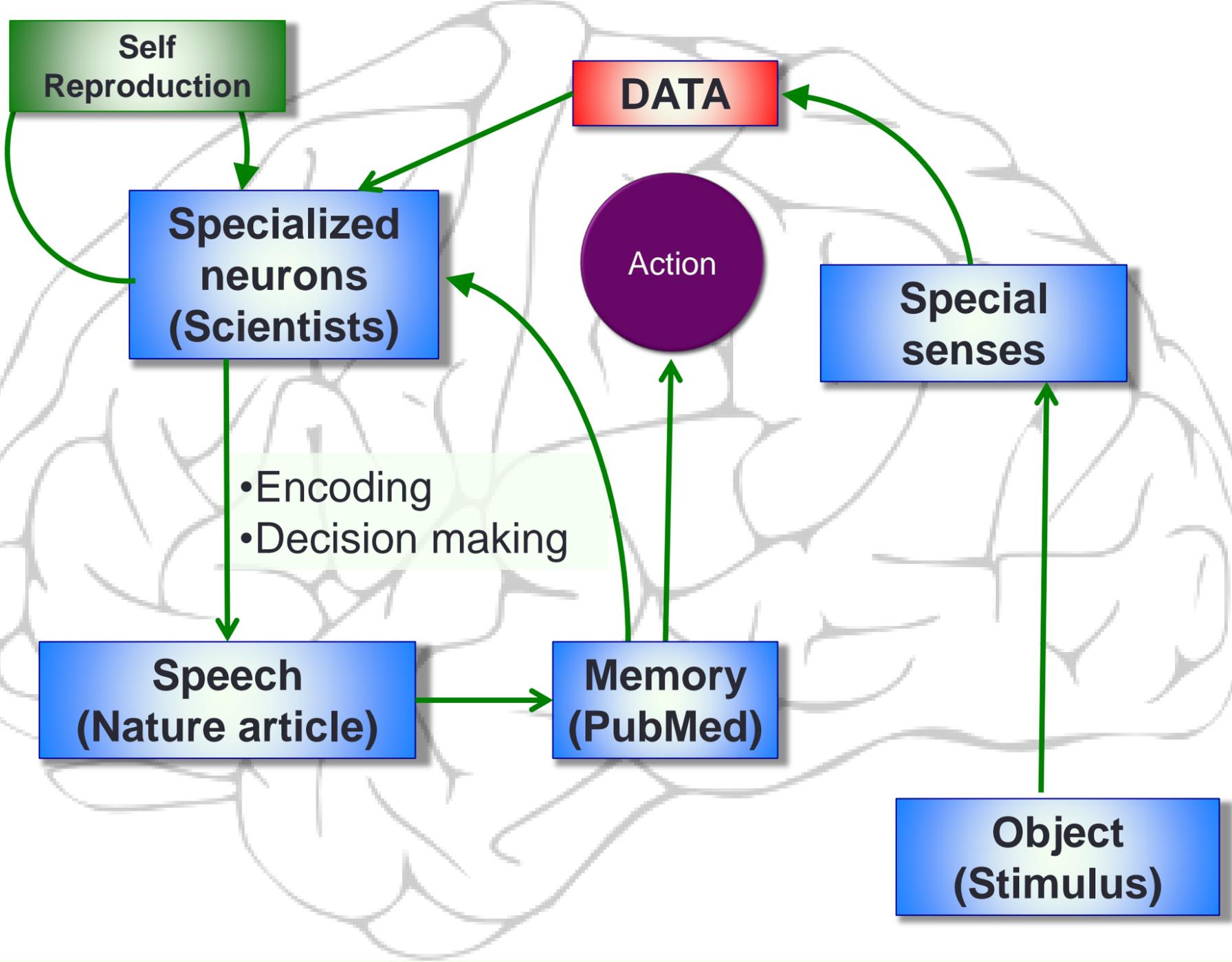


The octopus genome and the evolution of cephalopod neural and morphological novelties

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97% of expressed protein-coding genes and 83% of the estimated 2.7 gigabase (Gb) genome size (Methods and Supplementary Notes 1-3). The unassembled fraction is dominated by high-copy repetitive sequences (Supplementary Note 1). Nearly 45% of the assembled genome is composed of repetitive elements, with two bursts of transposon activity occurring ~25-million and ~56-million years ago (Mya) (Supplementary Note 4).



9. Expanded recapitulation
(27 comparisons – non exhaustive list)



Analogy



Human Brain

World Brain

Evolution and embryology	Complete
Length of evolution	13.7 billion years
Structural Unit	≈ 80 billion neurons
Number of neurons over time	Diminishable with maturation
Neurogenesis and plasticity	Limited
Sensory	5 senses
Encoding	Receptors to electric impulses
Structural Connection	Wired
Speed of Transmission	Slow (150 m/s)
Method of transmission	Neurotransmitters
Programming	Tyranny of DNA and Rhinencephalon
Attention and focus	Generally fixed
Migration of neurons	Limited

Evolution and embryology	Continuous
Length of evolution	200.000 years
Structural Unit	≈8 billion people
Number of neurons over time	Rapid and careless increase
Neurogenesis and plasticity	Robust
Sensory	Extraordinarily expansive
Encoding	letters, numbers, etc.
Structural Connection	Wired and wireless
Speed of Transmission	Instantaneous (300.000 km/sec)
Methods of transmission	Various devices
Programming	Free will possible
Attention and focus	Extraordinary multi-tasking possible
Migration of Homo Sapiens	Exponentially growing



Analogy



Human Brain (continued)

World Brain (continued)

Imprinting	By external stimulus
Allocation of resources	Fixed and efficient
Localization	Relatively demarcated
Memory	Limited and often flawed
Mathematical Power	Limited
Level of Intellectual Power	Biologically fixed
Power dynamics	Declining over time
Quality of cognition	Imperfect
Rhinencephalon	Present
External control (Pyramidal cells)	Controls only muscle
Centralized control	Present (except in schizophrenia or bipolar)
Sleep-wake cycles	Required
Life expectancy	≈71 years
Death	Imminent

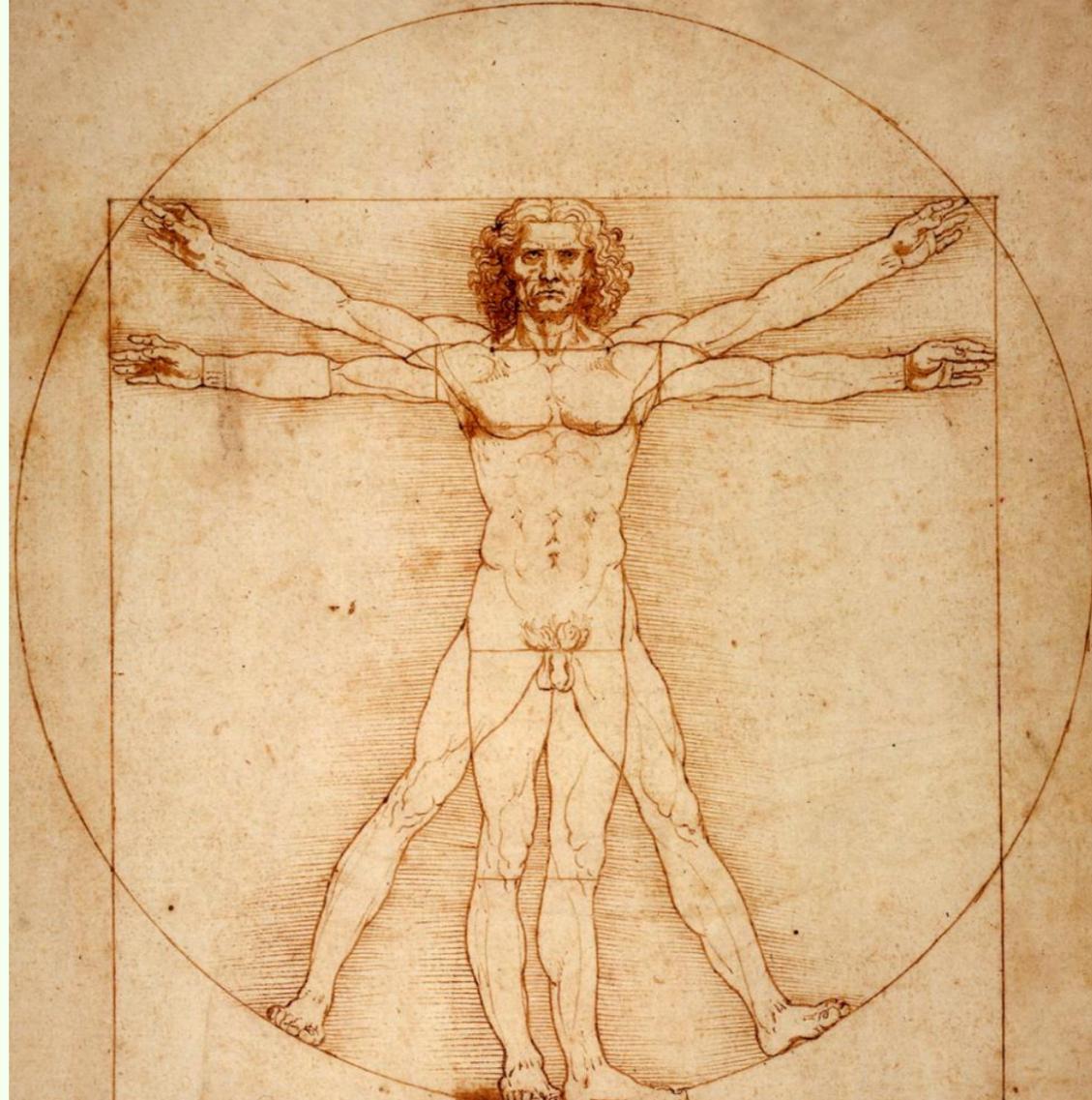
Imprinting	By other neurons
Allocation of resources	Confusing and indefinite
Localization	Wide spread
Memory	Exquisite and generally unfailing
Mathematical Power	Extraordinary
Level of Intellectual Power	Exponentially expanding
Power dynamics	Increasing ($V \approx t^6$)
Quality of cognition	Has different vetting arrangements
Rhinencephalon	Absent
External control (action network)	Extraordinary control
Centralized control	Absent
Sleep-wake cycles	Not required
Life expectancy	Indefinite
Death	Supposedly immortal



III

Diseases that could destroy and
injure the World Brain

Anything that hurts human brain, impacts the world brain



III. Diseases that could destroy and injure the world brain

- a. Cosmic causes of World Brain injury
- b. Internal human dysfunction causes of World Brain injury
 - Rational errors
 - Fiber tract compromise
 - Irrational fiber tract stimulation
 - Fiber tract restriction
 - Fiber tract injury
 - Internecine immune response and cancer-like World Brain destruction

III.a. Possible cosmic causes of World Brain death



Thus, World Brain extinction from cosmic causes is unlikely for eons!

The Timeline Of The Mass Extinction Events On Earth

Rank	Extinction Event	Approximate Time Of Occurrence
1	Holocene extinction	Present
2	Cretaceous–Paleogene extinction event	65 million years ago
3	Triassic–Jurassic extinction event	199 million to 214 million years ago
4	Permian–Triassic extinction event	251 million years ago
5	Late Devonian extinction	364 million years ago
6	Ordovician–Silurian extinction events	439 million years ago

Big 5 Mass Extinctions on Earth

Name	Period	% of life extinction	Cause	Extinct species
Ordovician–silurian extinction	439 million years ago	86%	Glaciation Falling sea levels	Trilobites Brachiopods, Graptolites
Late devonian extinction	364 million years ago	75%	Giant land plants Volcanic ash	Trilobites Spiders and scorpions Elpistostegalians
Permian–triassic extinction	251 million years ago	96%	Volcanic eruption Methane emission Acidic ocean	Ancient coral species
Triassic–jurassic extinction	199 - 214 million years ago	-	Asteroid impact Climate change Flood basalt eruption	Archosaurs
Cretaceous–paleogene extinction	65 million years ago	76%	Volcanic activity Asteroid impact Climate change	Dinosaurs



The Death of Julius Caesar
Vincenzo Camuccini (1771–1844)
Glasgow Museums Resource Center

III.b. Internal human dysfunction

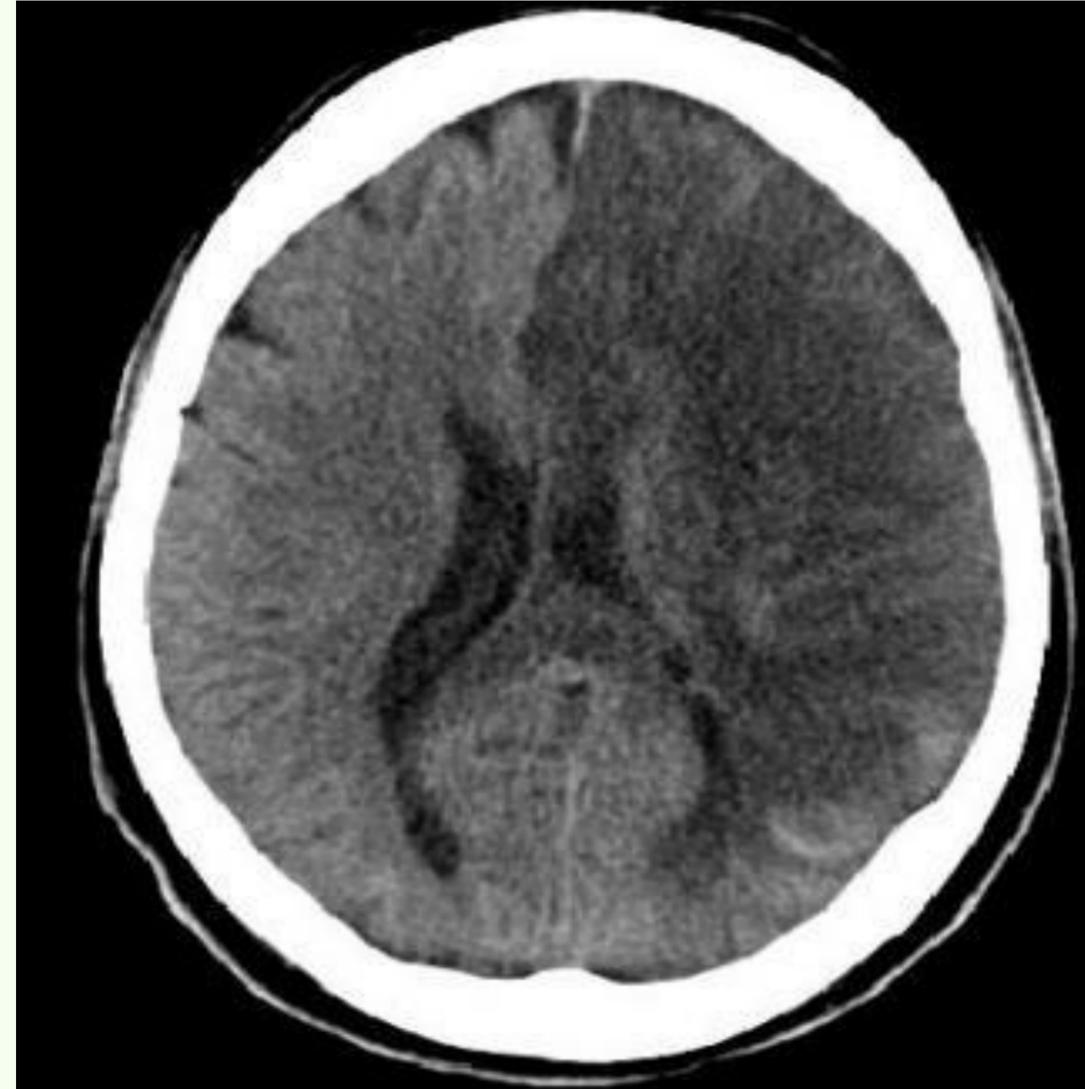
- ...The fault, dear Brutus, is not in our stars but in ourselves, that we are underlings...

(Julius Caesar, Act I, Scene II, L. 140-141)

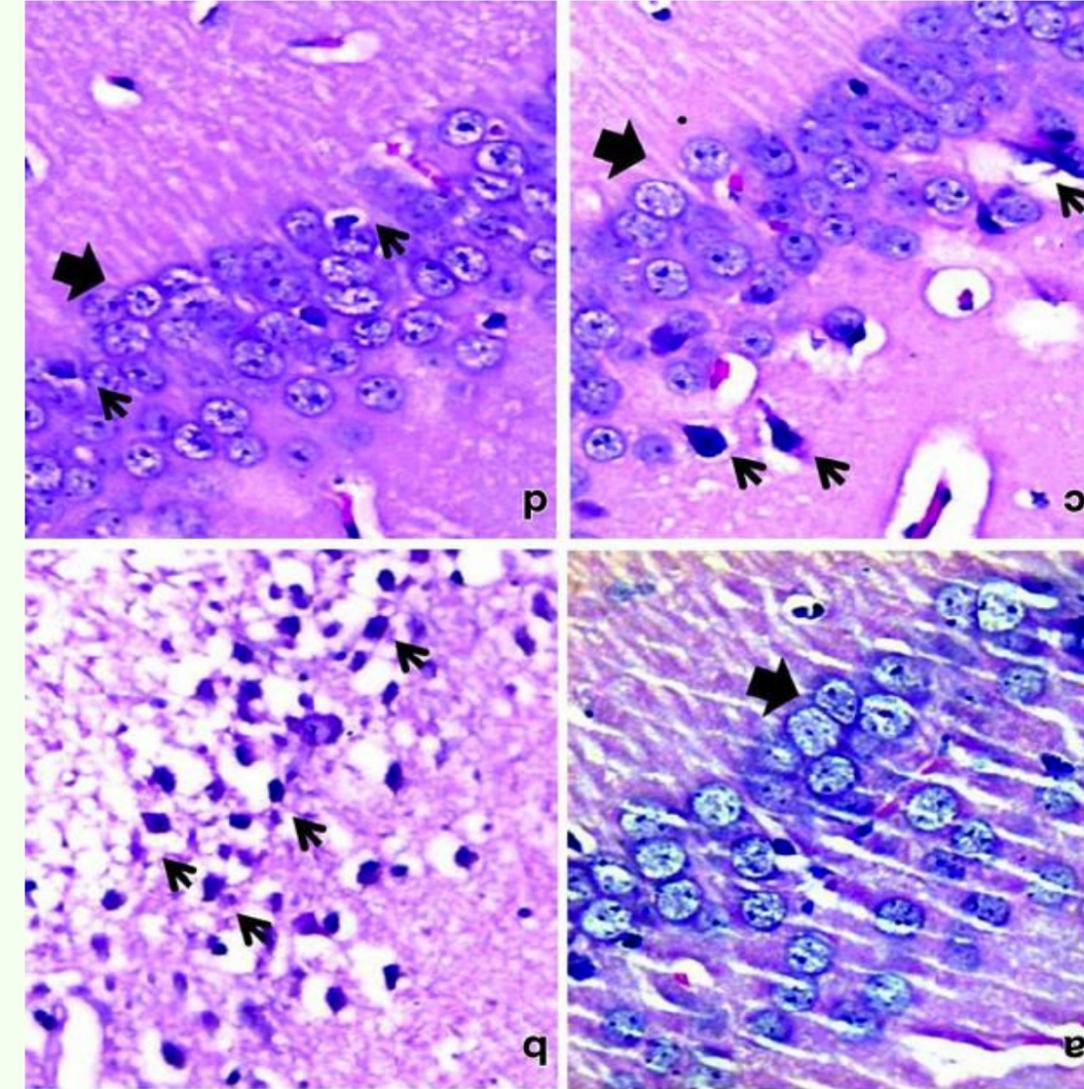
William Shakespeare

Rational errors (no intent, correctible)

Stroke VS. Air pollution



Heavy metal intoxication VS. exposure to toxic waste



Abscess VS. Plague



Anoxic brain injury VS. Famine





Fiber tract compromise

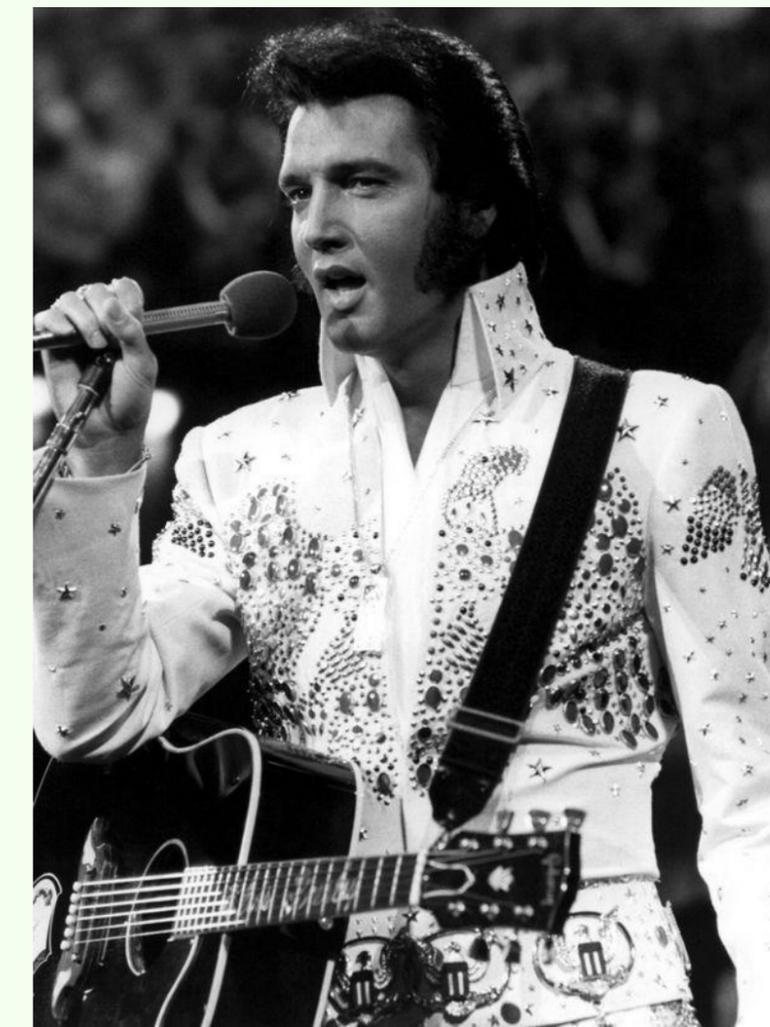
- **Irrational or erroneous fiber tract stimulation**
- Excessive fiber tract restriction
- Fiber tract injury
- Internecine immune response and cancer-like World Brain destruction



Delusions



Human necessity for myths and irrational information





Barbarossa awakens, 19th-century painting by Hermann Wislicenus in the Imperial Palace of Goslar



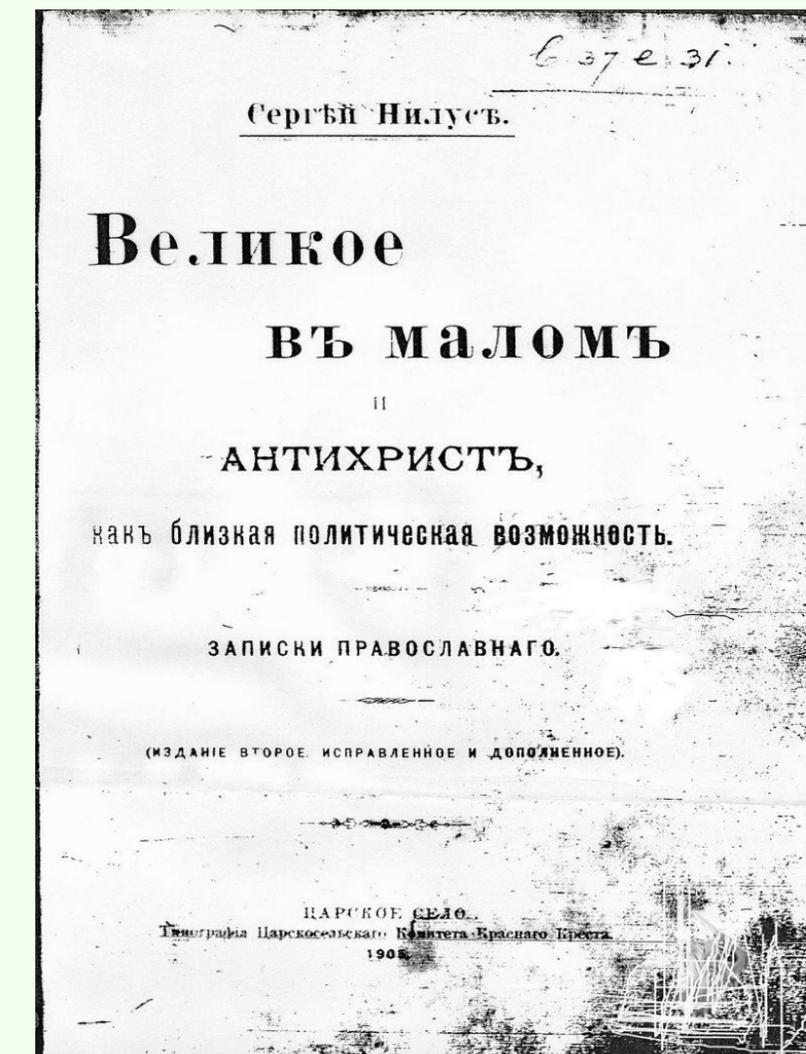
Emperor Frederick Barbarossa in Kyffhäuser, Germany





The Jewish Protocols of the Elders of Zion

Anti-Semitic fabricated text purporting to describe a Jewish plan for global domination





Schön scandal

Jan Hendrik Schön

Before he was exposed,

Schön had received:

- Otto-Klung-Weberbank Prize for Physics
- Braunschweig Prize in 2001
- Outstanding Young Investigator Award

All of which were later rescinded



Fake Science

fraudulent breakthrough discoveries



Fiber tract compromise

- Irrational fiber tract stimulation
- **Excessive fiber tract restriction**
- Fiber tract injury
- Internecine immune response and cancer-like
World Brain destruction

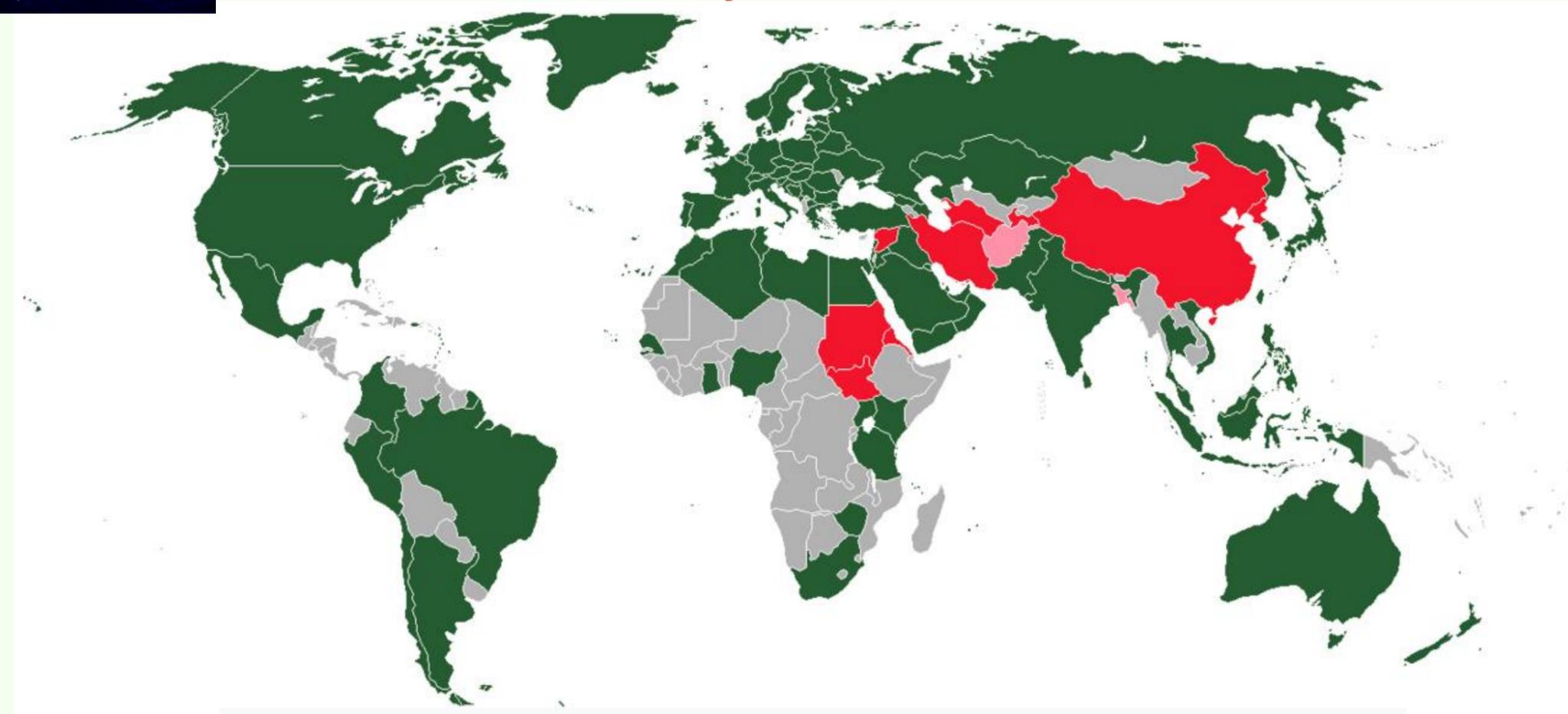


Pathological Repression

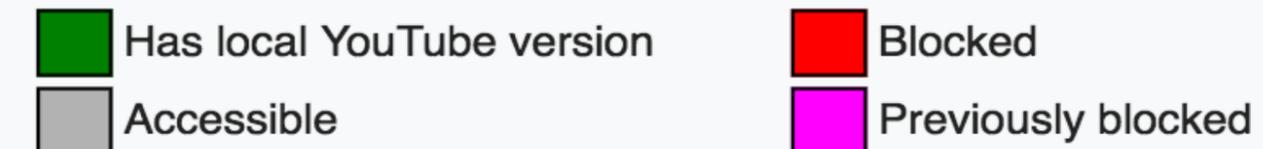
- process of attempting to repel desires towards pleasurable instincts
- the desire is moved to the unconscious
- Immature defense mechanism
- seemingly unexplainable naivety



Arbitrary Restriction

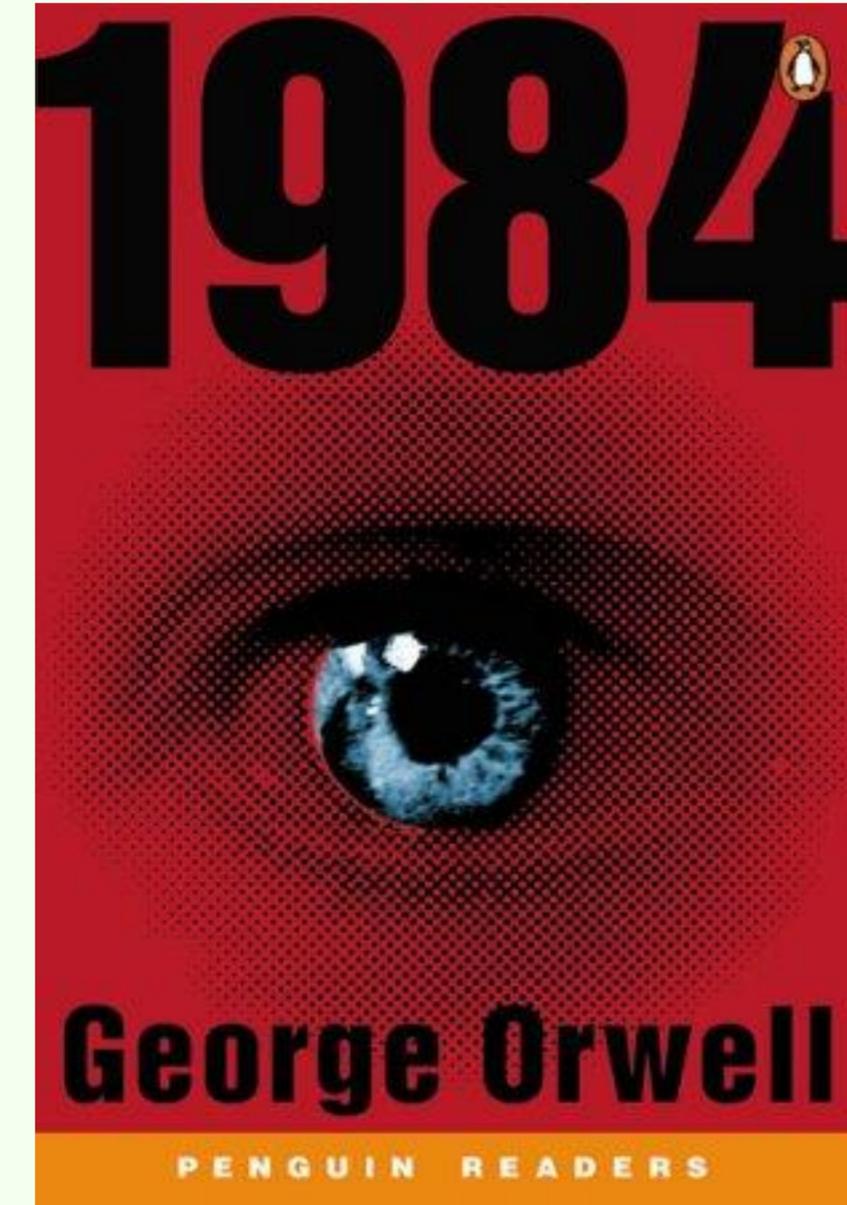


World map showing the status of YouTube blocking





Totalitarian World Brain Control



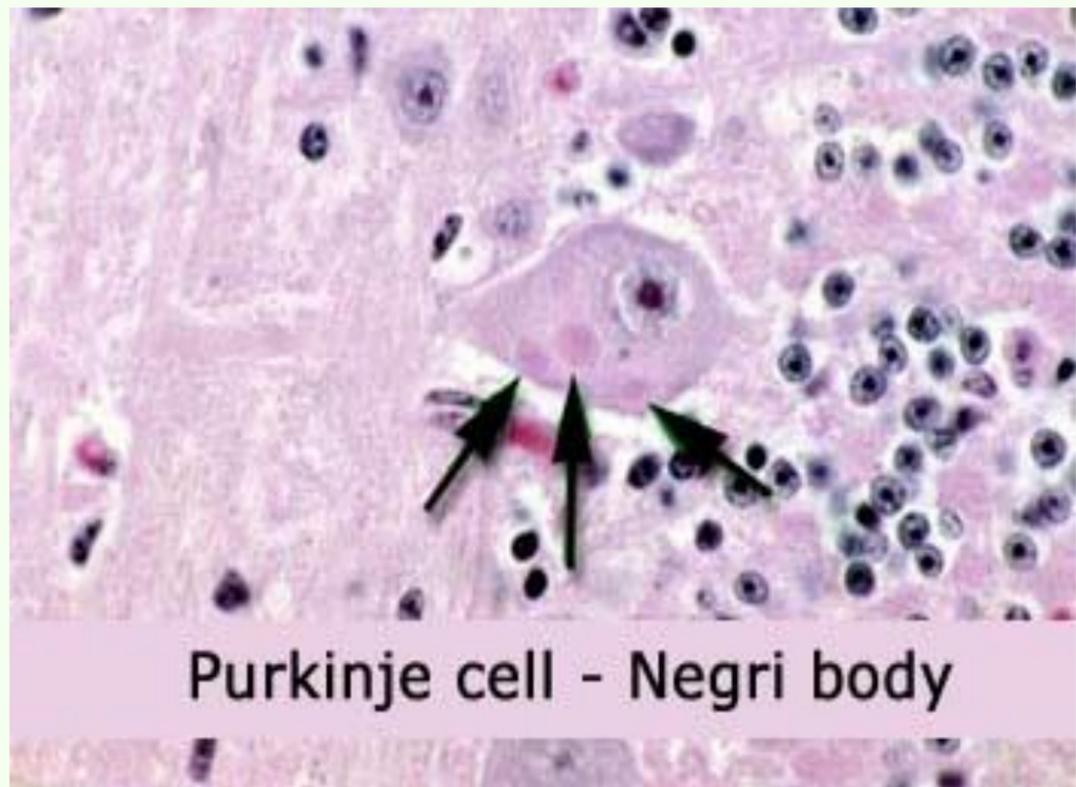


Fiber tract compromise

- Irrational fiber tract stimulation
- Excessive fiber tract restriction
- **Fiber tract injury**
- Internecine immune response and cancer-like
World Brain destruction

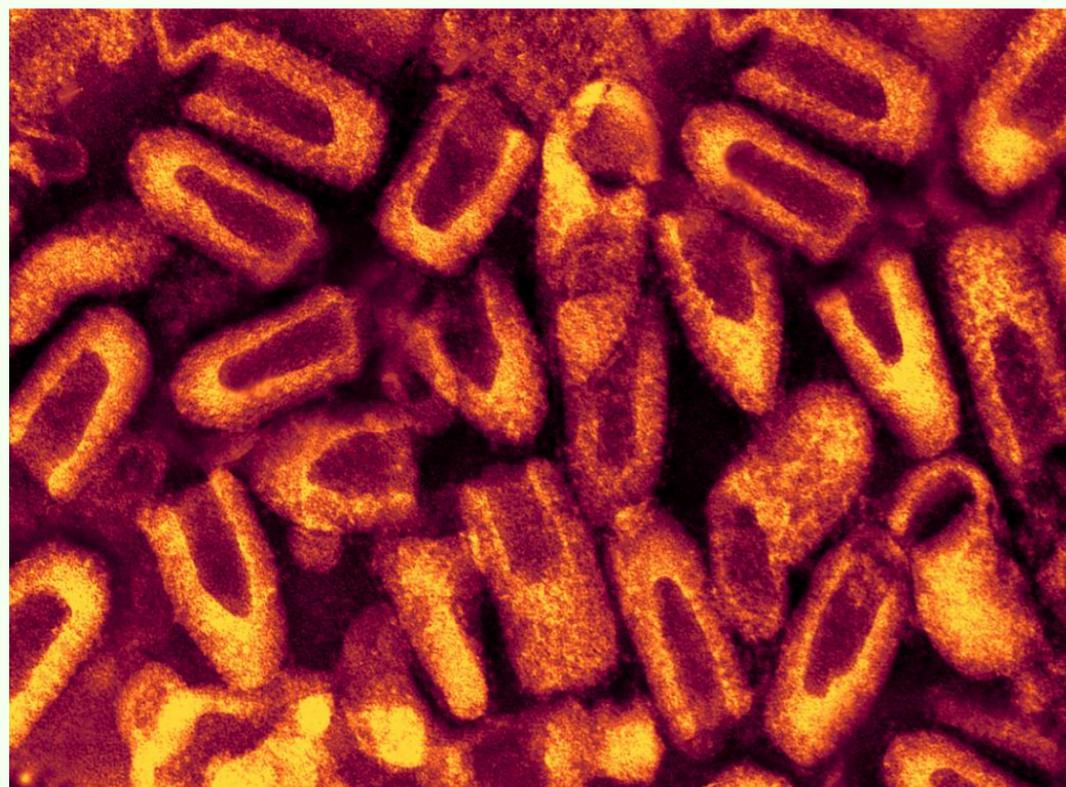


Viral infections of the brain - Rabies



Purkinje cell - Negri body

Light microscopy
(30 x magnification)



Electron microscopy
(70.000 x magnification)



Internet viruses

```
if not __LIB_FLAME_PROPS_LOADED__ then
  LIB_FLAME_PROPS_LOADED__ = true
  flame_props = {}
  flame_props.FLAME_ID_CONFIG_KEY = "MANAGER"
  flame_props.FLAME_TIME_CONFIG_KEY = "TIMER"
  flame_props.FLAME_LOG_PERCENTAGE = "LEAK.L"
  flame_props.FLAME_VERSION_CONFIG_KEY = "MA"
  flame_props.SUCCESSFUL_INTERNET_TIMES_CONFI
  flame_props.INTERNET_CHECK_KEY = "CONNECTIO
  flame_props.BPS_CONFIG = "GATOR.LEAK.BANDW
  flame_props.BPS_KEY = "BPS"
  flame_props.PROXY_SERVER_KEY = "GATOR.PROXY
  flame_props.getFlameId = function()
    if config.HasKey(flame_props.FLAME_ID_CO
      local l 1 0 = config.get
```

STUXNET – one of the most dangerous internet viruses used for cutting down Iran's progressing atomic plant's framework



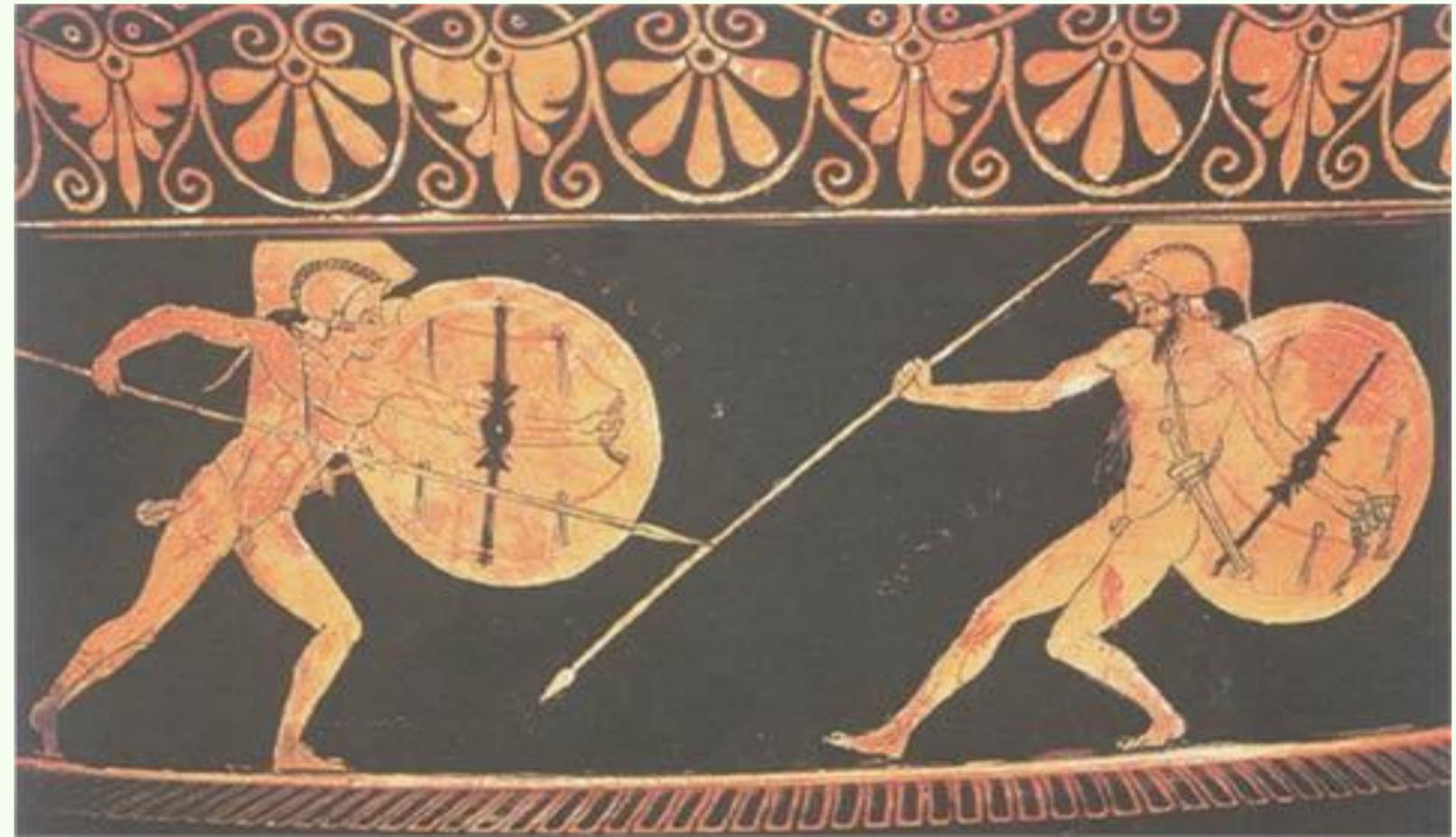
Fiber tract compromise

- Irrational fiber tract stimulation
- Excessive fiber tract restriction
- Fiber tract injury
- **Internecine immune response and cancer-like World Brain destruction**



War and human conflict

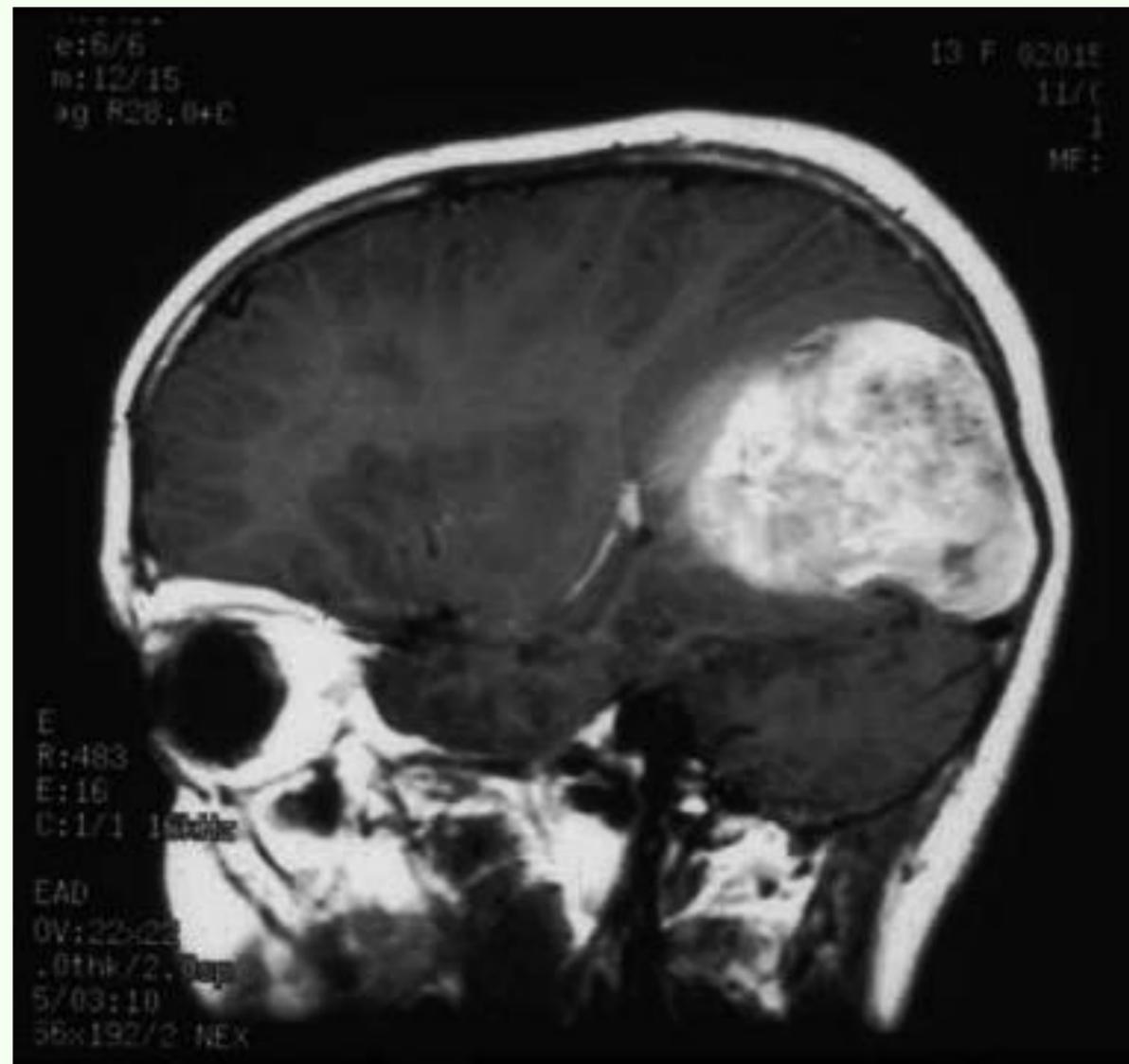
- Use of the power of the World Brain to injure
- Outlanders



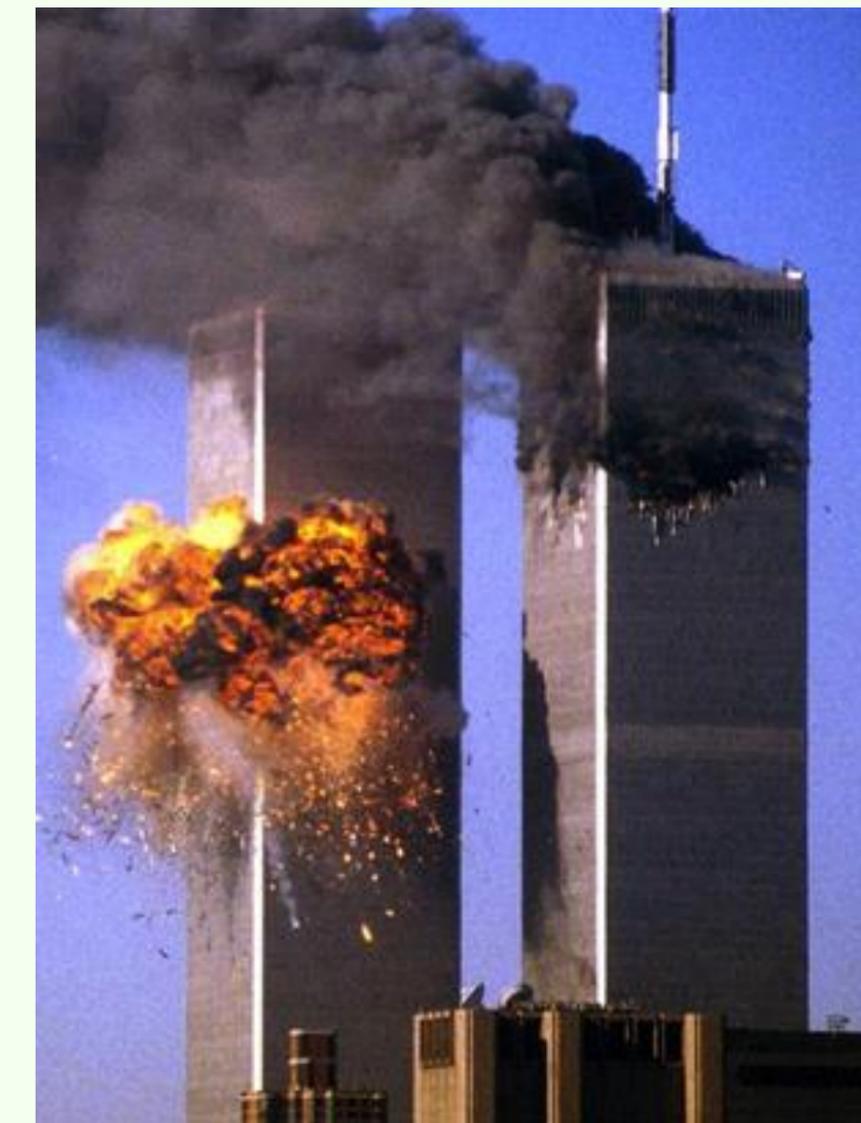




Astrocytoma Grade I

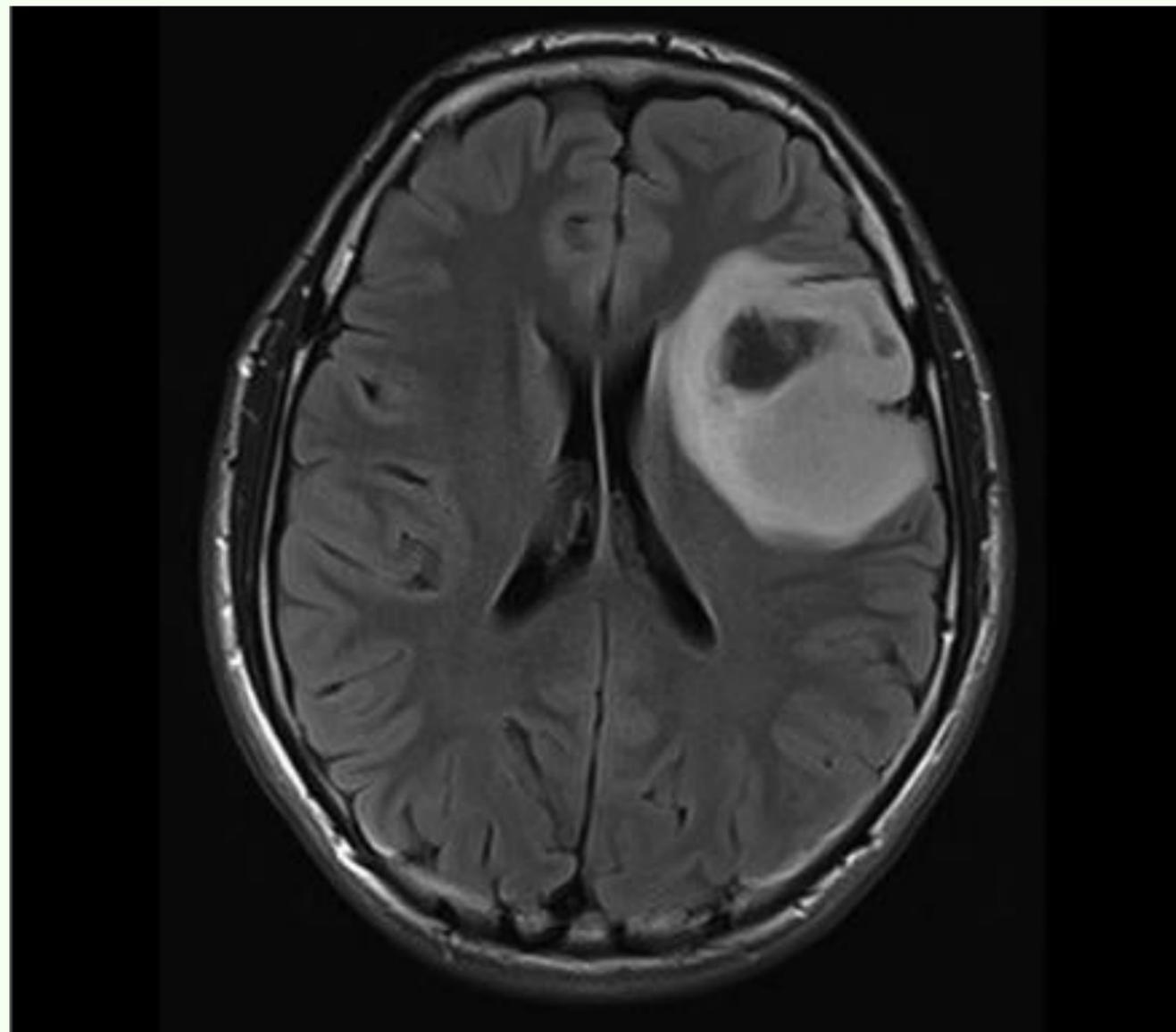


Cultural conflict





Astrocytoma Grade II

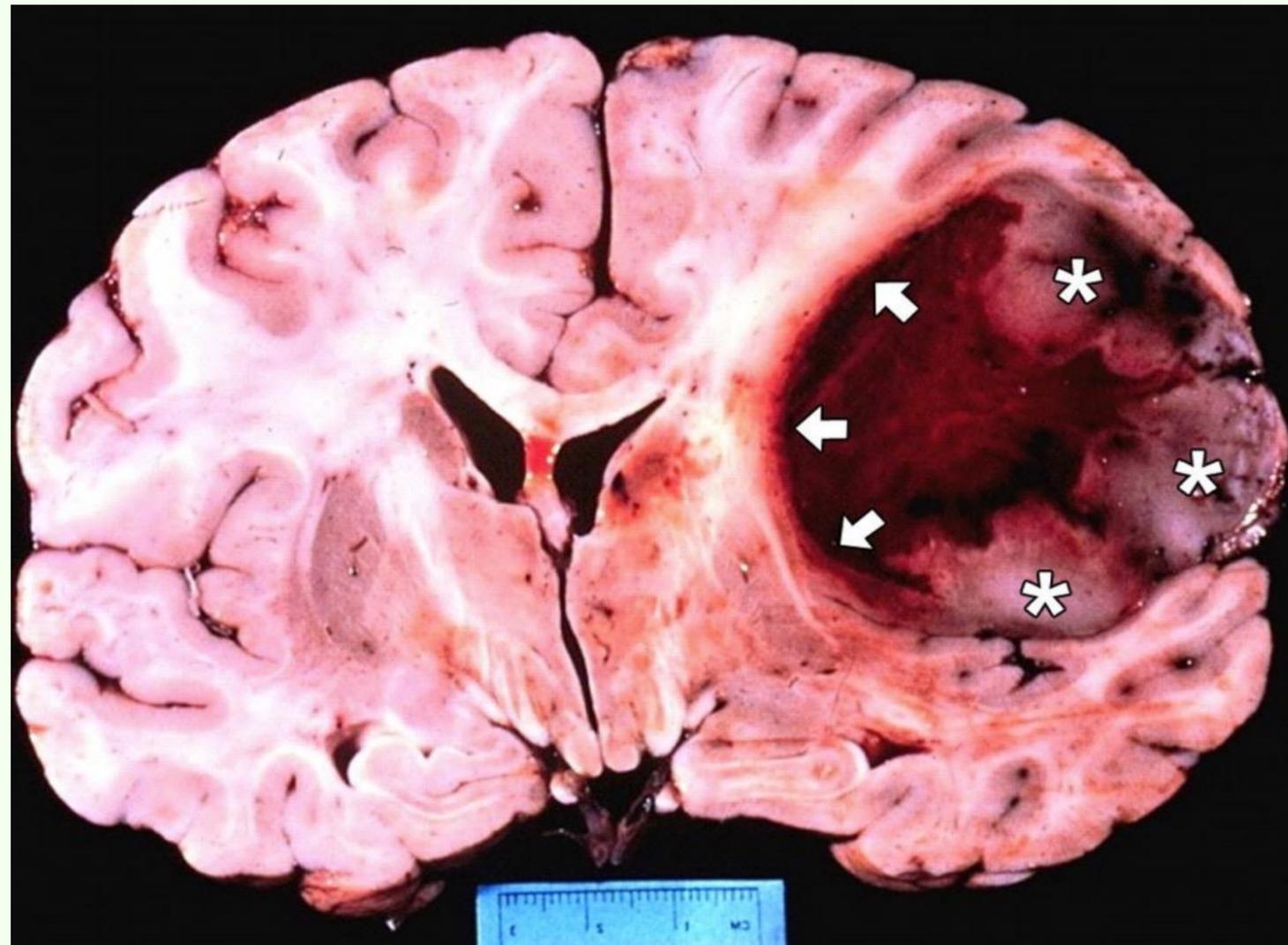


Refugees





Astrocytoma Grade IV (GBM)



Unhealthy neurons attempting to take over other parts of the brain (war)

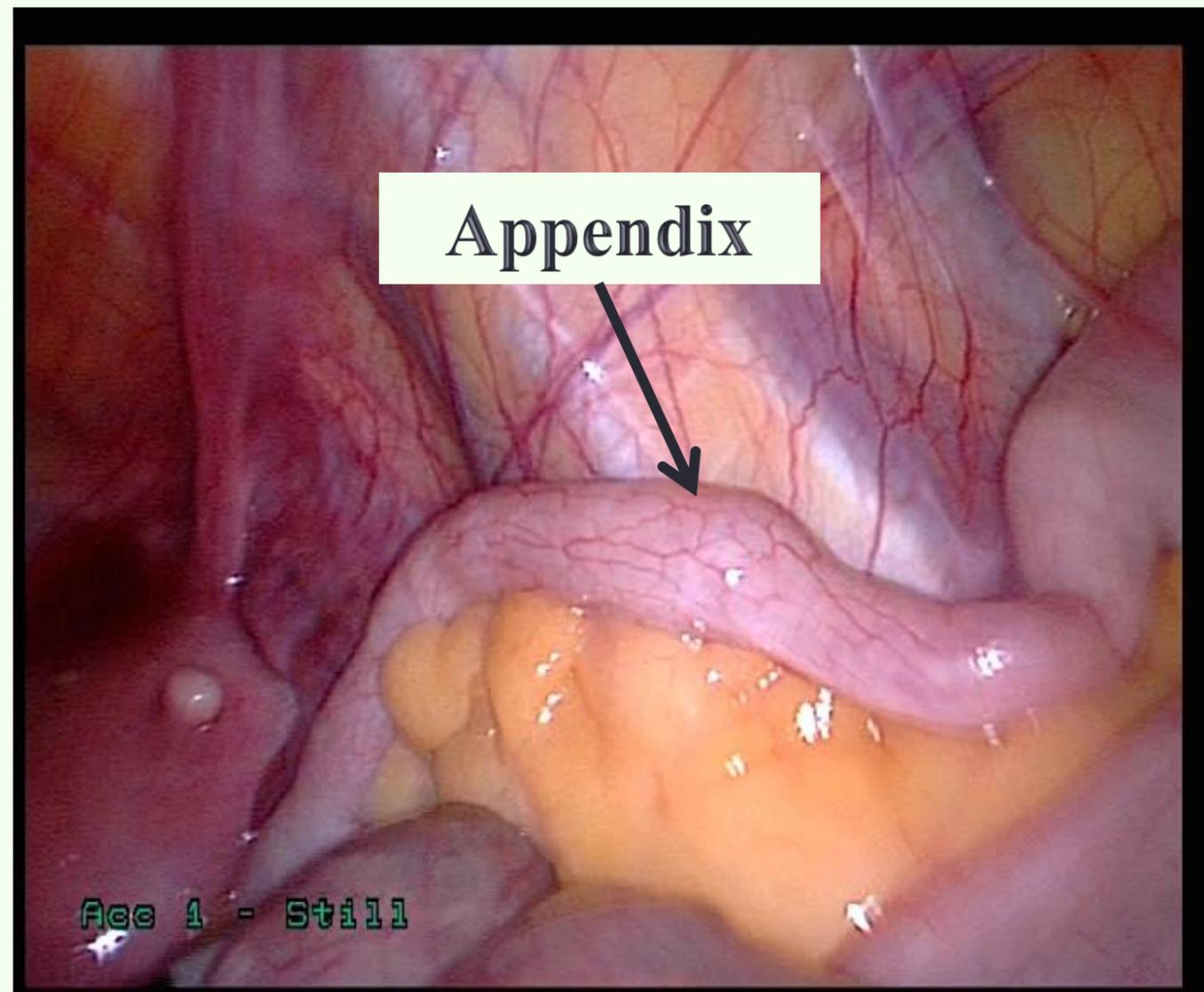




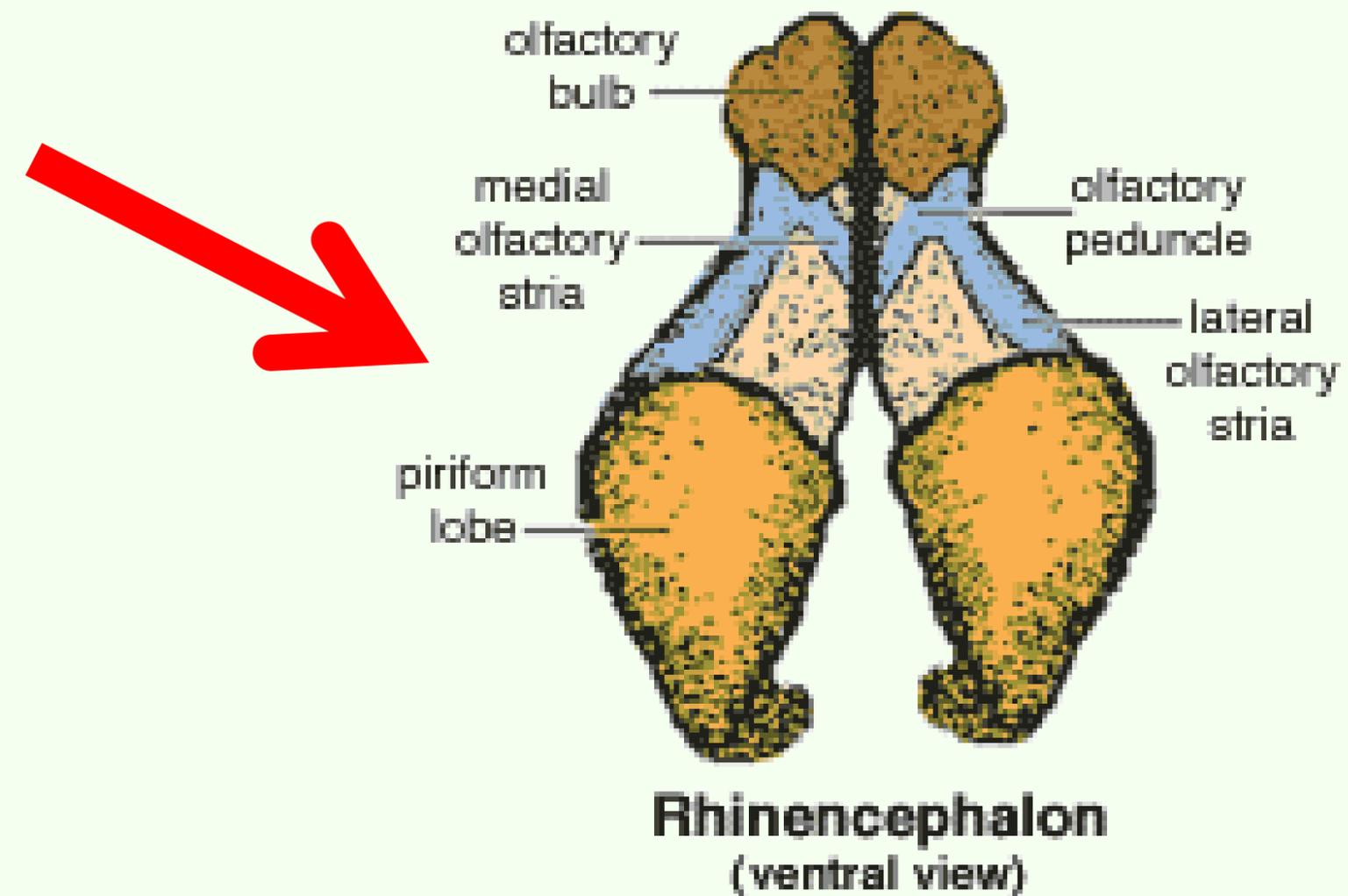
IV

Etiology of these diseases

Evolutionary baggage



Evolutionary baggage



V

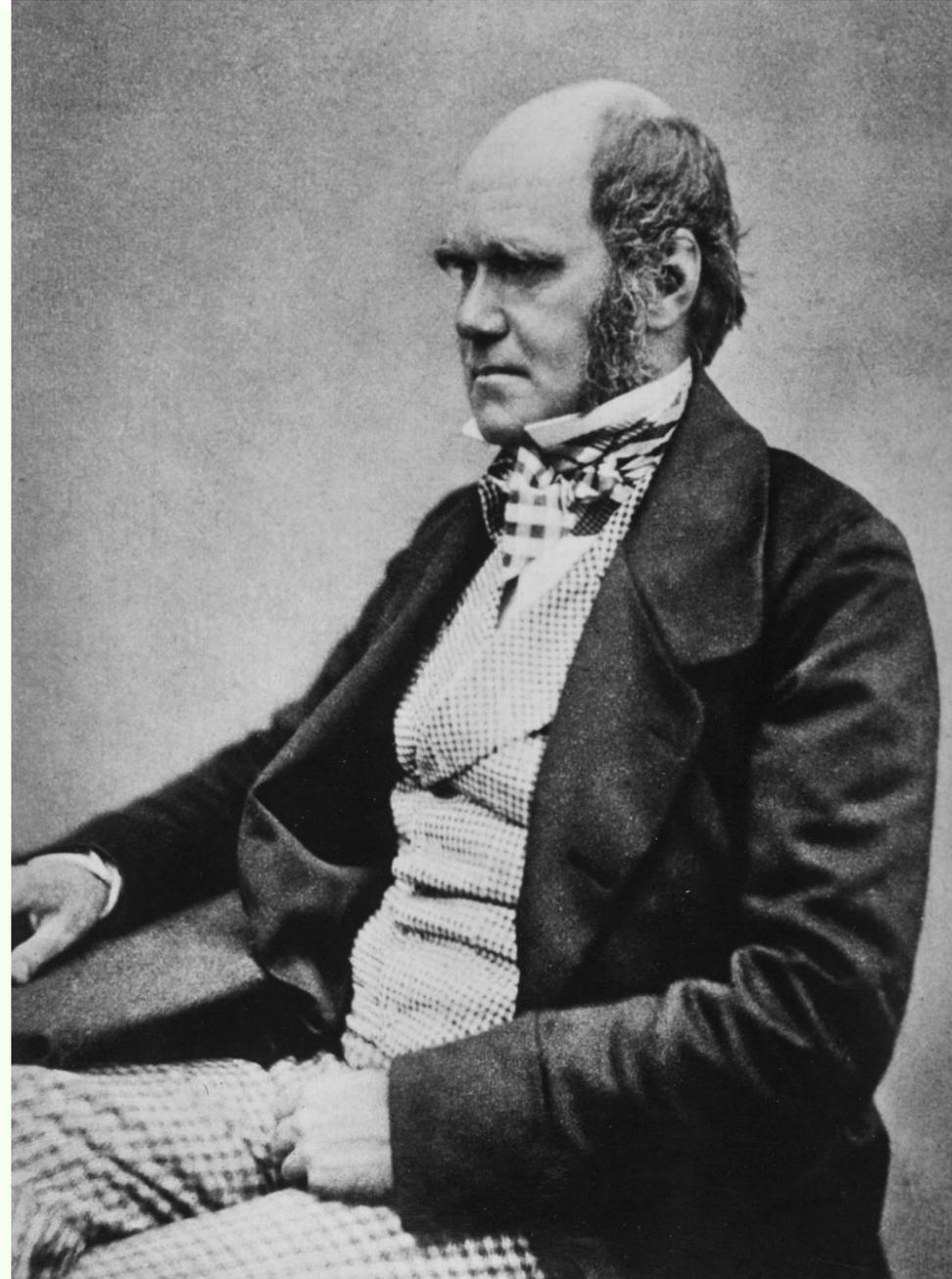
Pathogenesis of these diseases

Negative effect of:

- Differences
- Stress
- The World Brain

Charles Darwin

1809-1882



Darwinian dynamics and human Rhinencephalon
misuses the power of the World Brain to destroy
different Homo Sapiens
which is inevitable

The human selfish gene
– the ultimate master of Rhinencephalon



Sexual Reproduction - the driver of differentiation

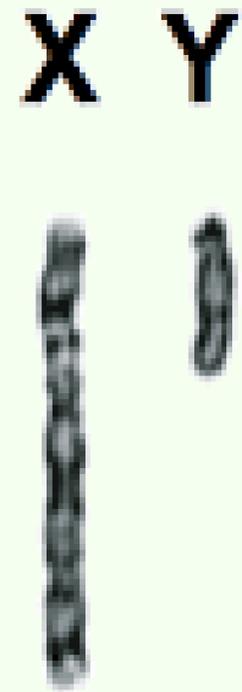
- Fractofusus, first creature dependent on sexual reproduction
- Pre-Cambrian
- 560 million years ago



Humans are Different: XX vs XY chromosomes



female



male

Love? Sex?



Thus love/sex produces humans with different genetic gifts which complicates efforts toward equality

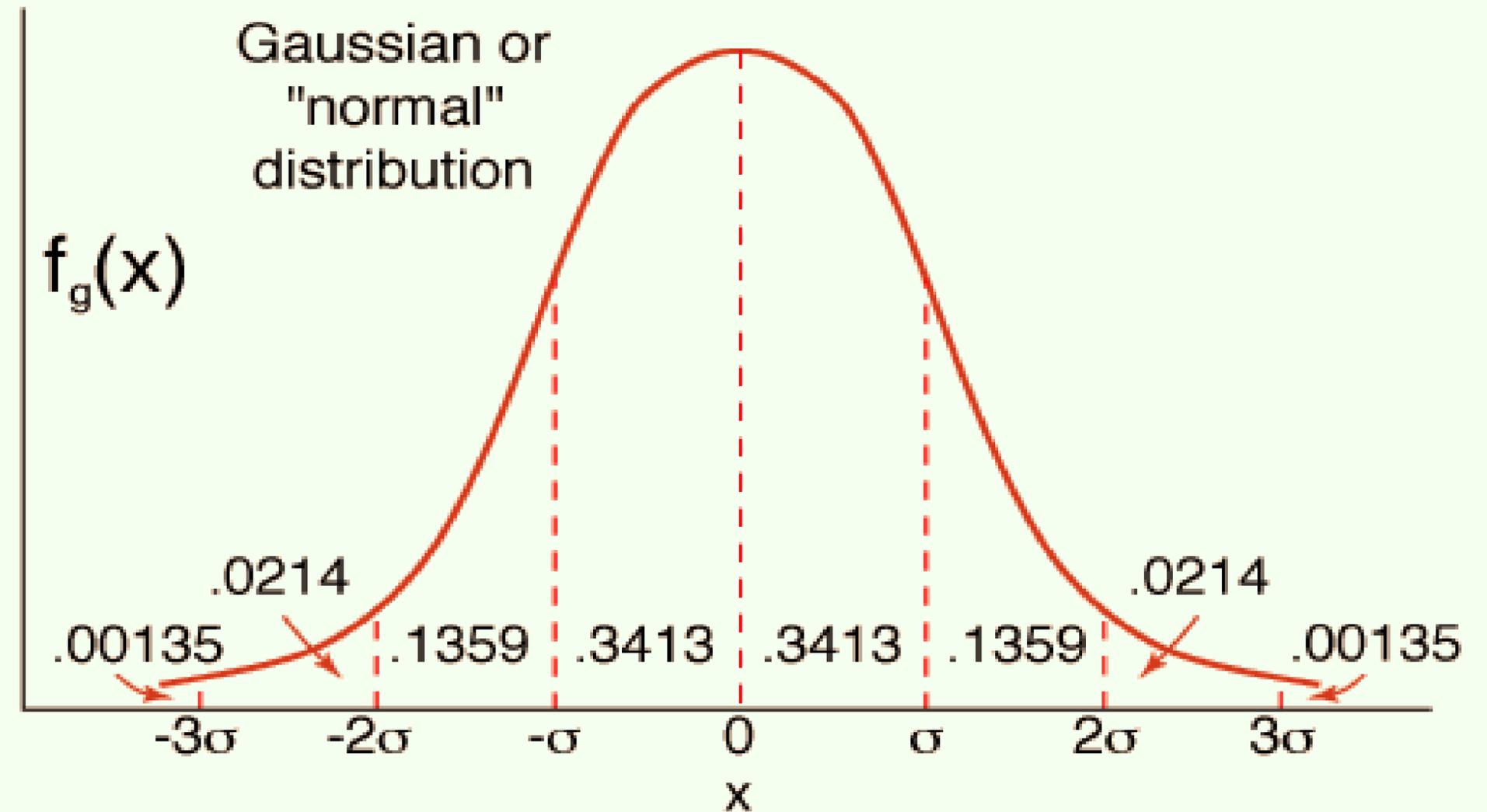
Moreover, humans are decidedly different



Gauss 1777-1855



Gaussian distribution



Genetic Bottle Neck 70,000 B.C.

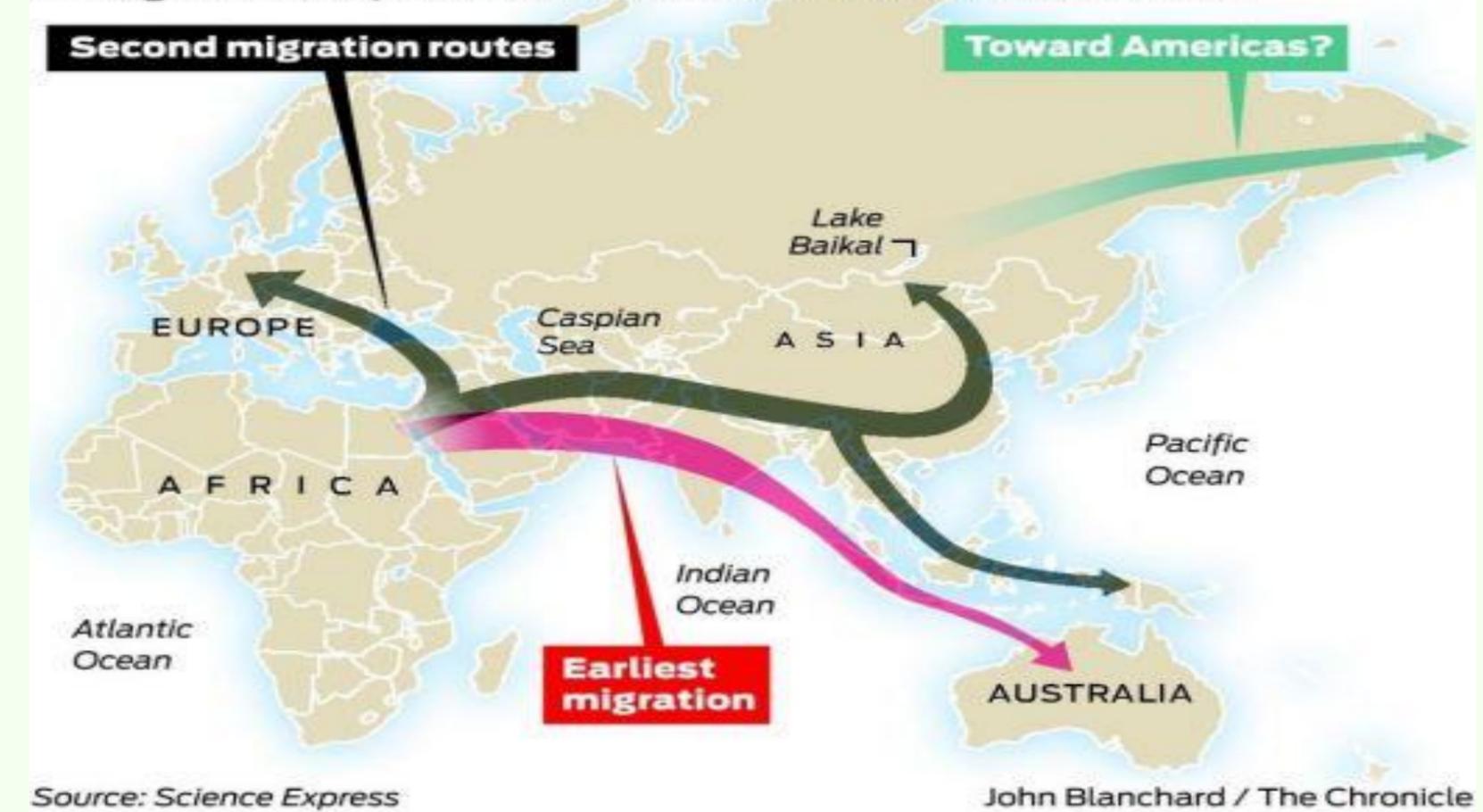
- Lake Toba
- Super volcano
- Created genetic bottleneck
- Left Homo sapiens down to “only a few tens of thousands of individuals.”²



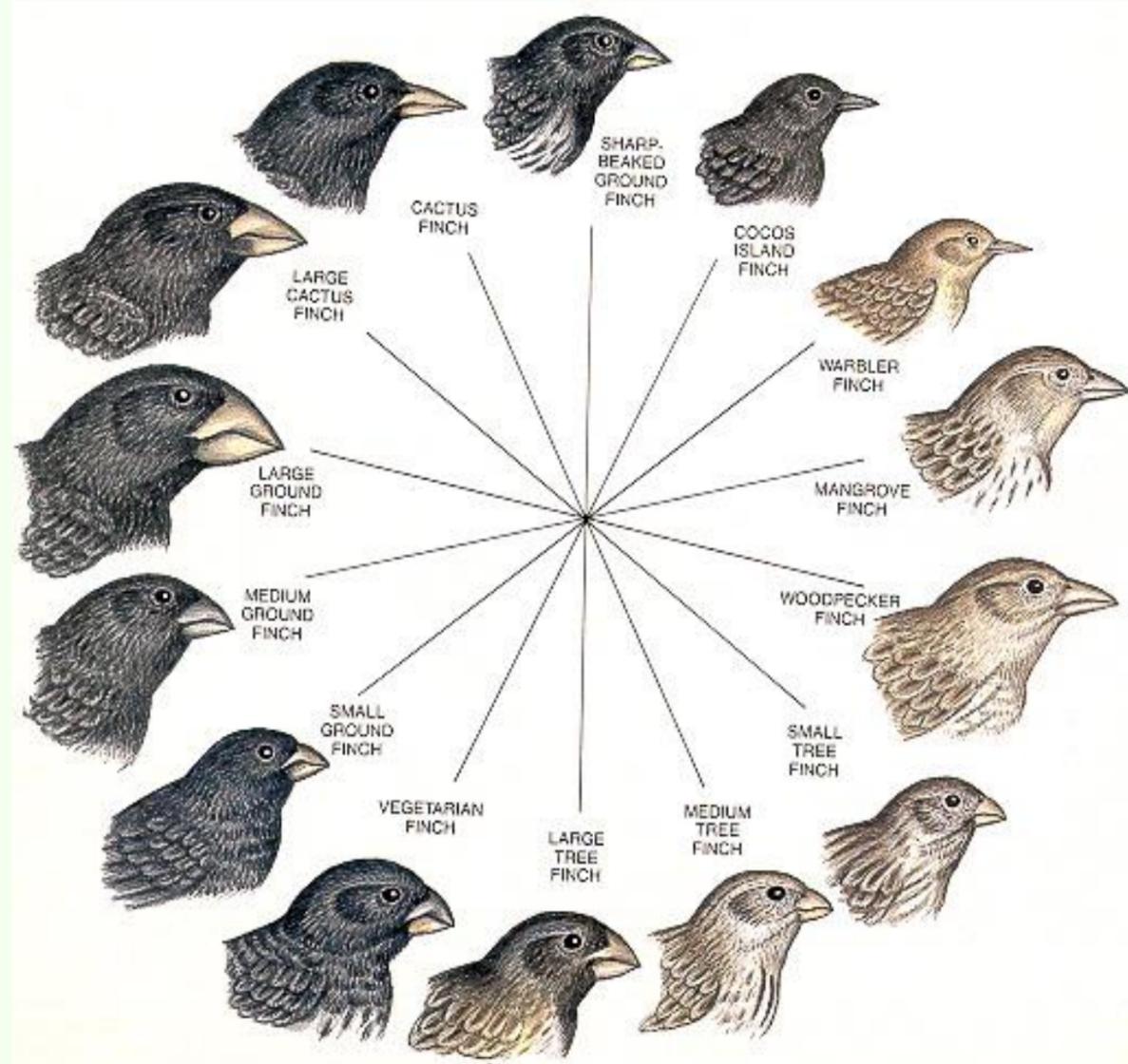
Isolated Human Genetic Pools Cause Darwinian Tension

Out of Africa

The first migration of ancient humans out of Africa began 70,000 years ago and reached Australia. A later one carried humans throughout Europe and across the vast Eurasian continent.



Darwin - observed species differentiation in the Galapagos Islands



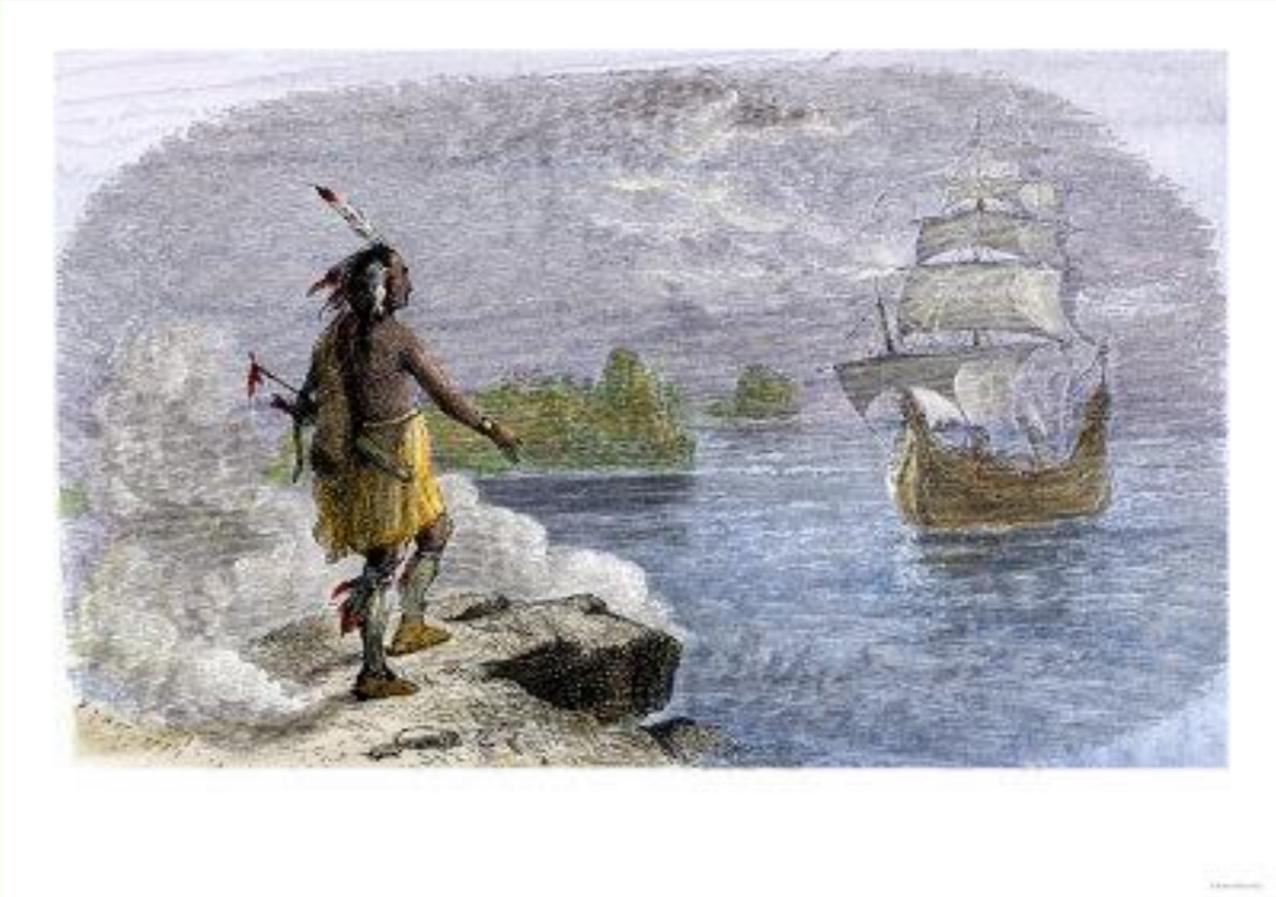
The Tower of Babel

Bruegel

1552 A.D.



A Brotherly Reunion After 3500 Generations



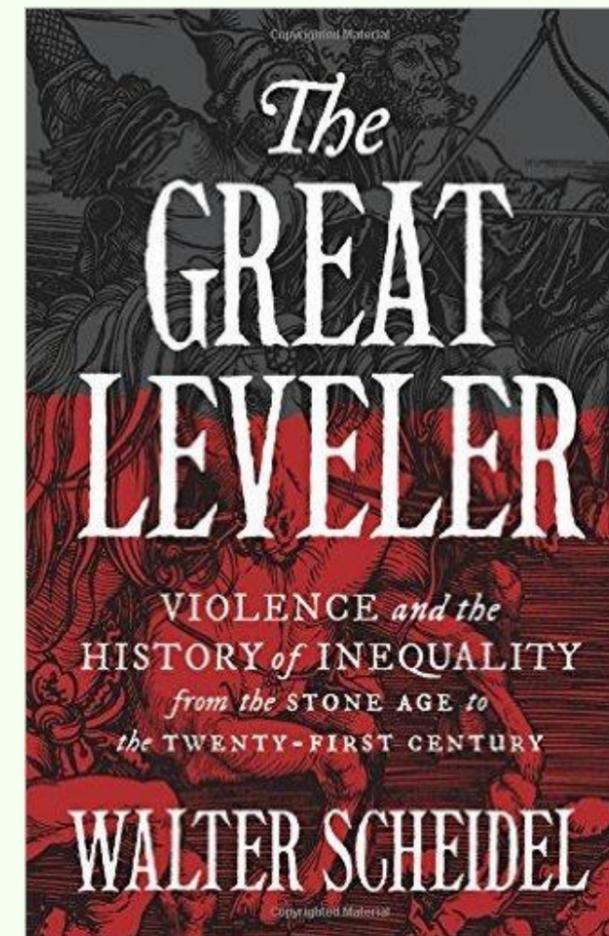
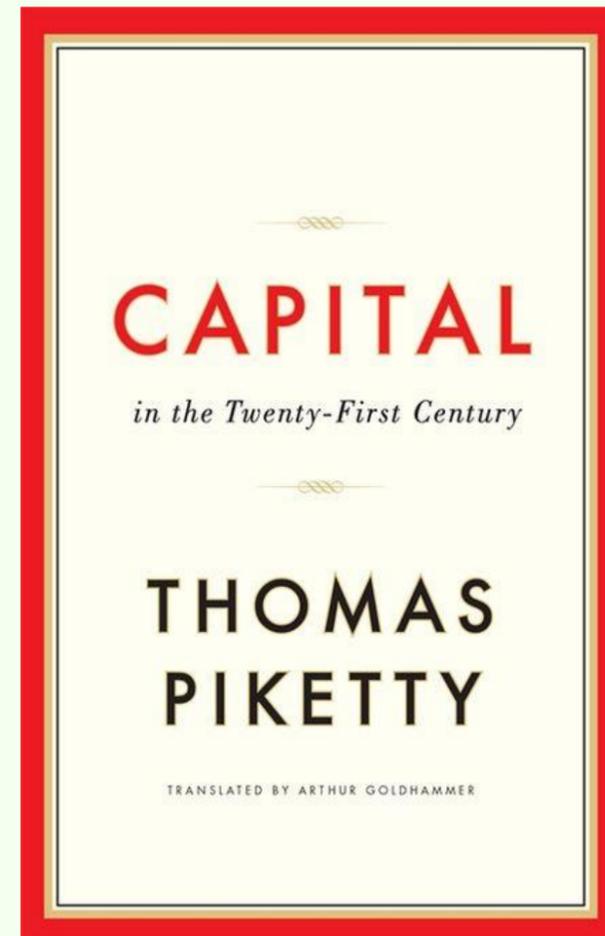
Economic disparities also exacerbates
Rhinnencephalon response to differences

Such human differences are reflected in differing economic circumstances



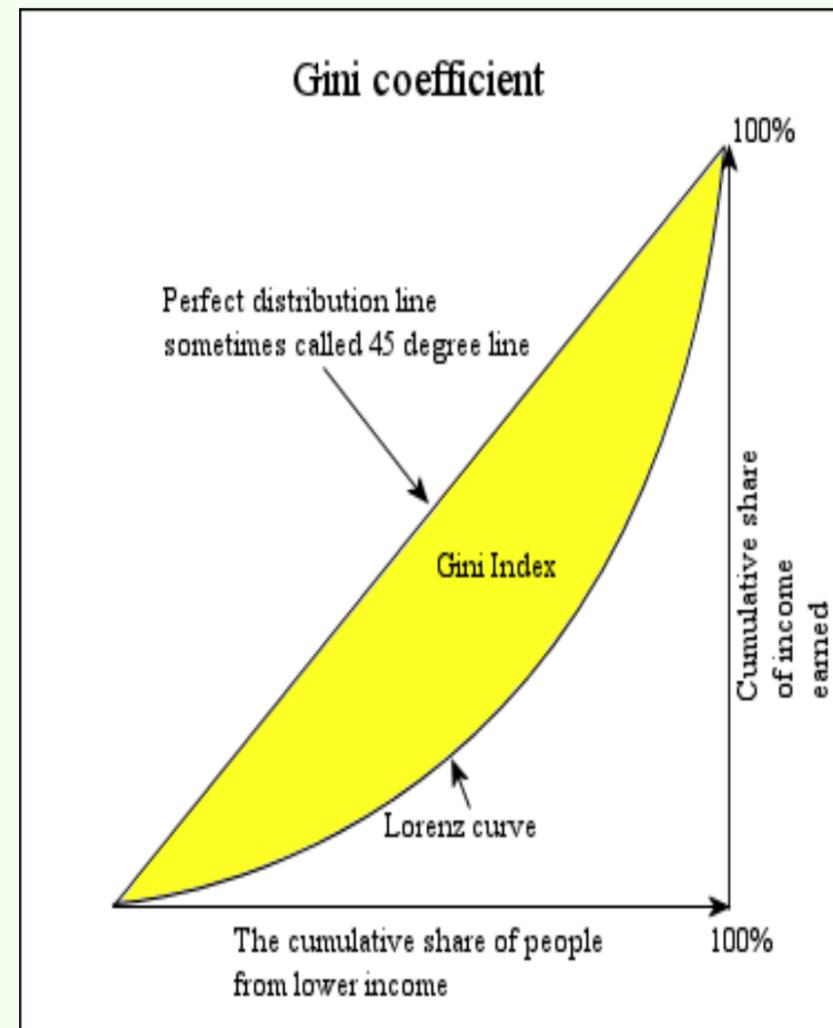
John Locke

Property Rights and
Economic Inequalities

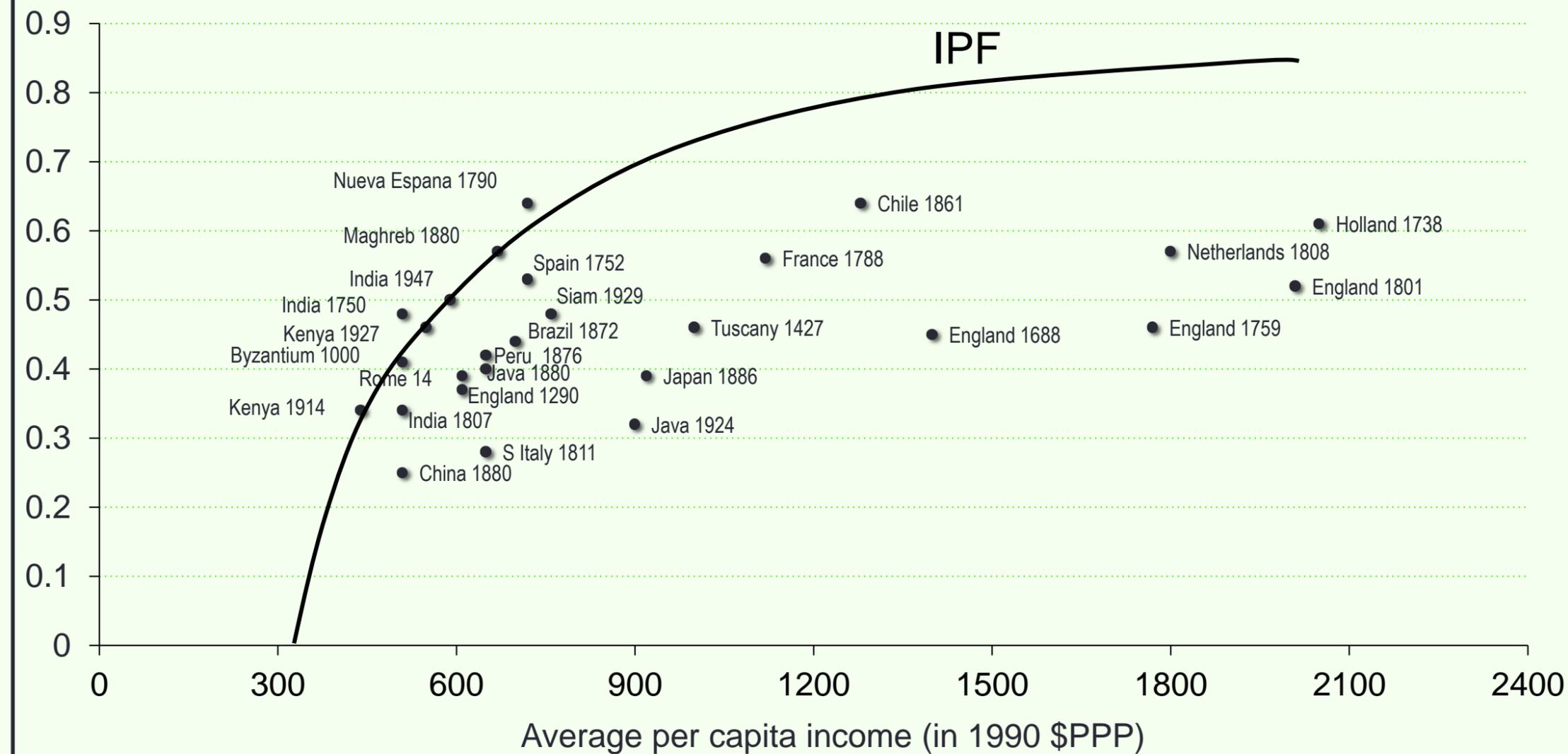


Gini coefficient

- A statistical measure of the degree of variation or inequality represented in a set of values, used especially in analyzing income inequality.



Estimated Income Gini Coefficients and the Inequality Possibility in Preindustrial Societies



The power of the World Brain is sunlight for different world populations in some ways increasing economic disparities and thus possibilities for world brain destruction

Without Sunlight



EOD-R



With Sunlight

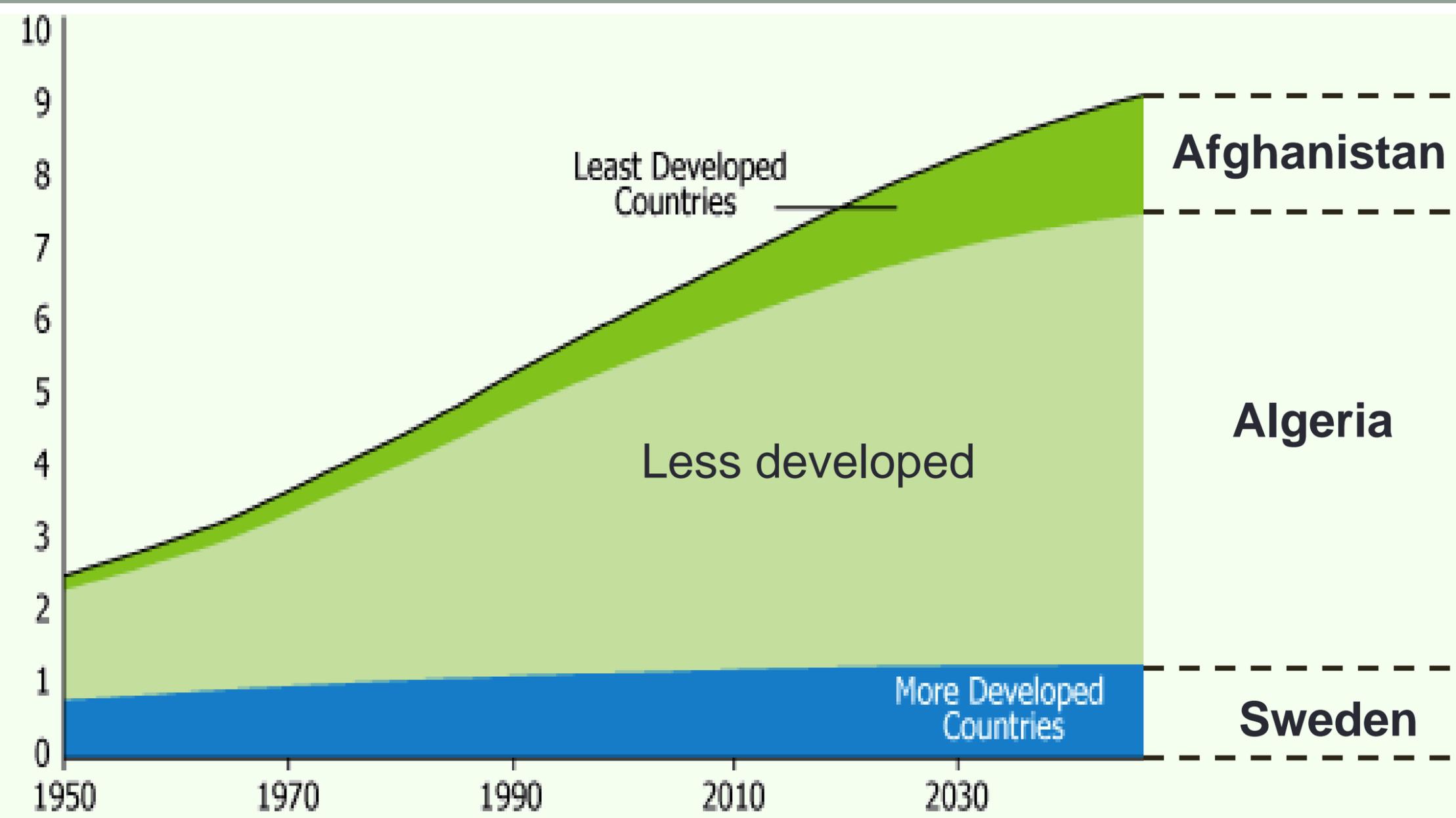


EOD-FR

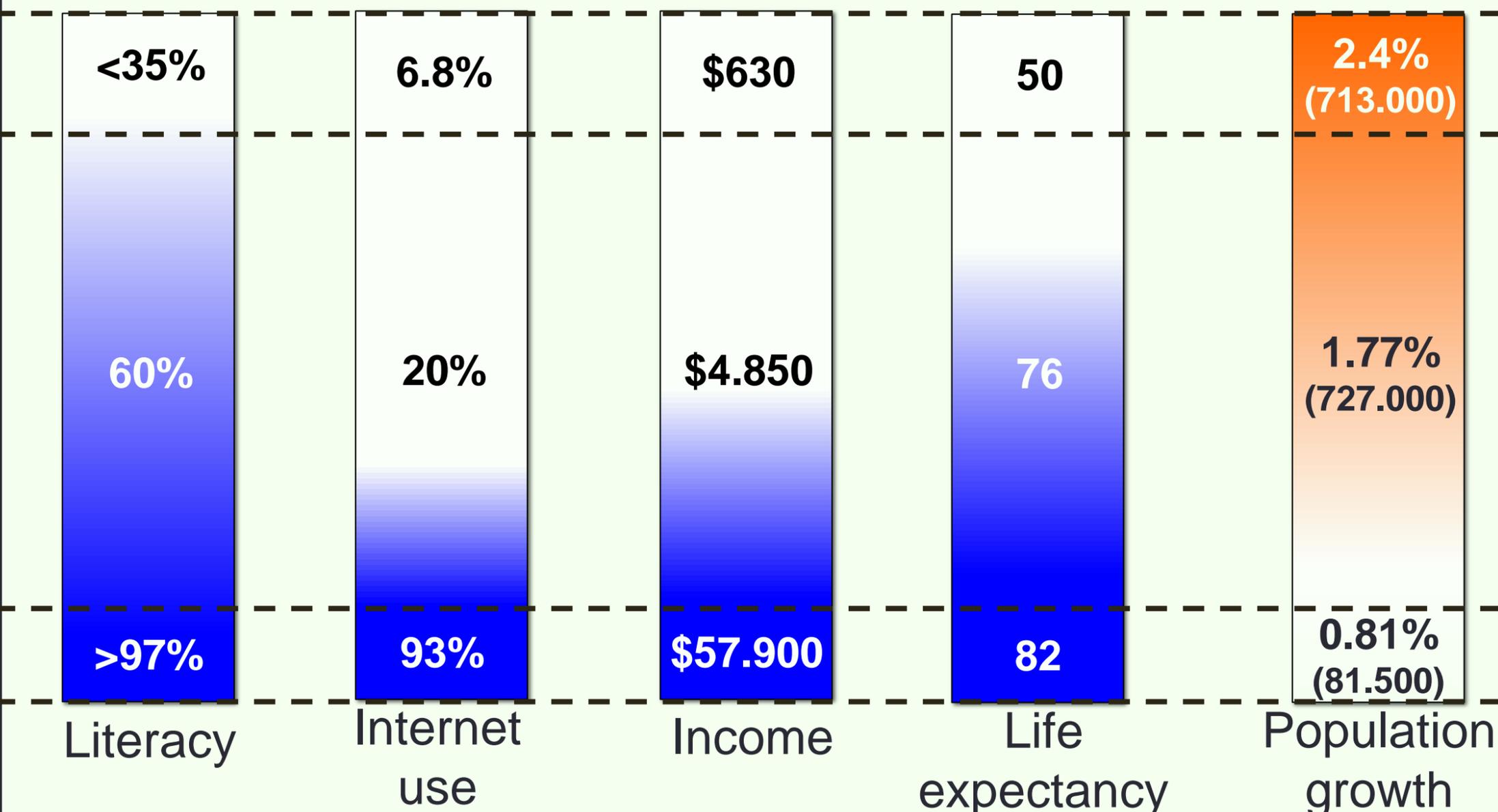


cv Christmas Eve



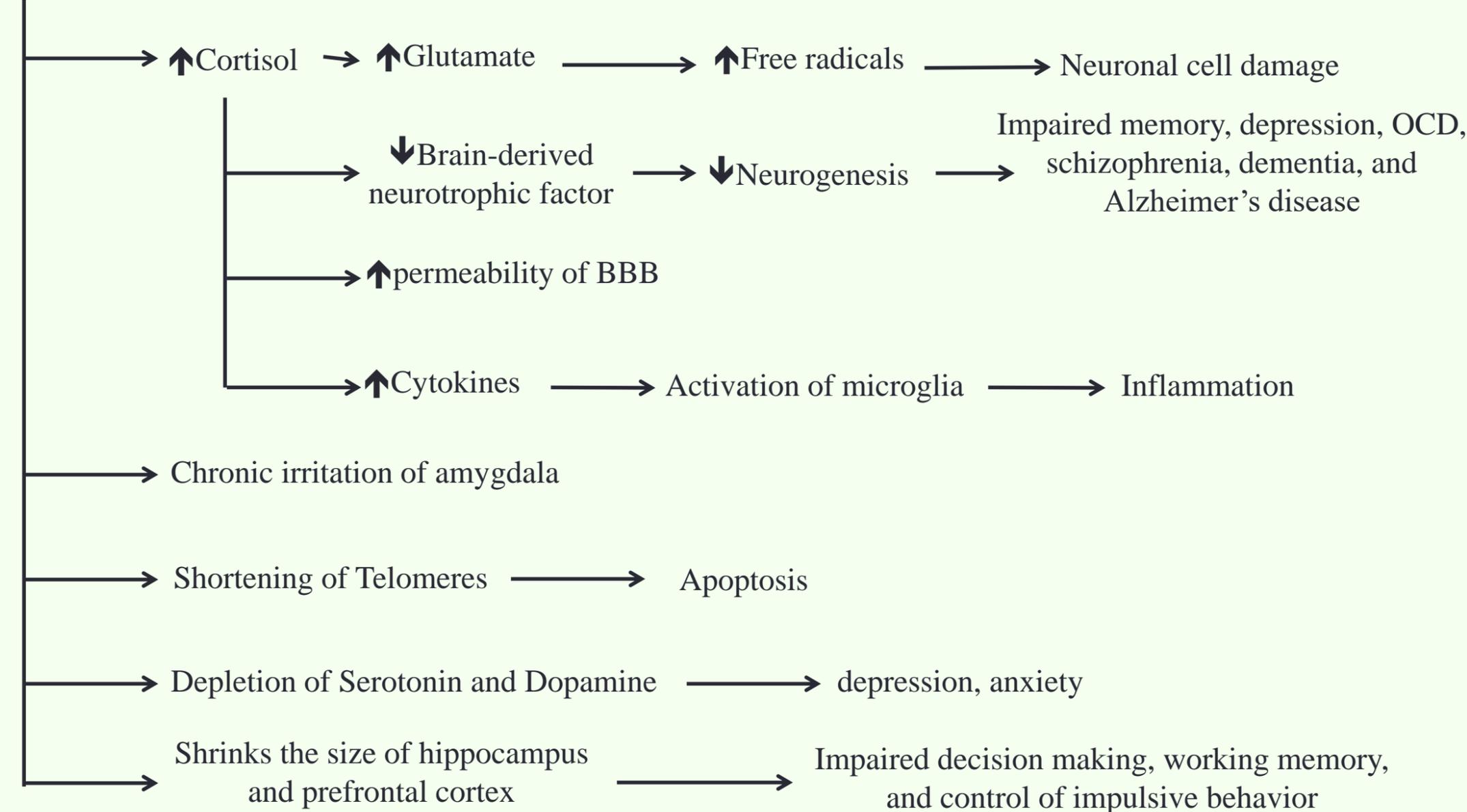


The actual situation

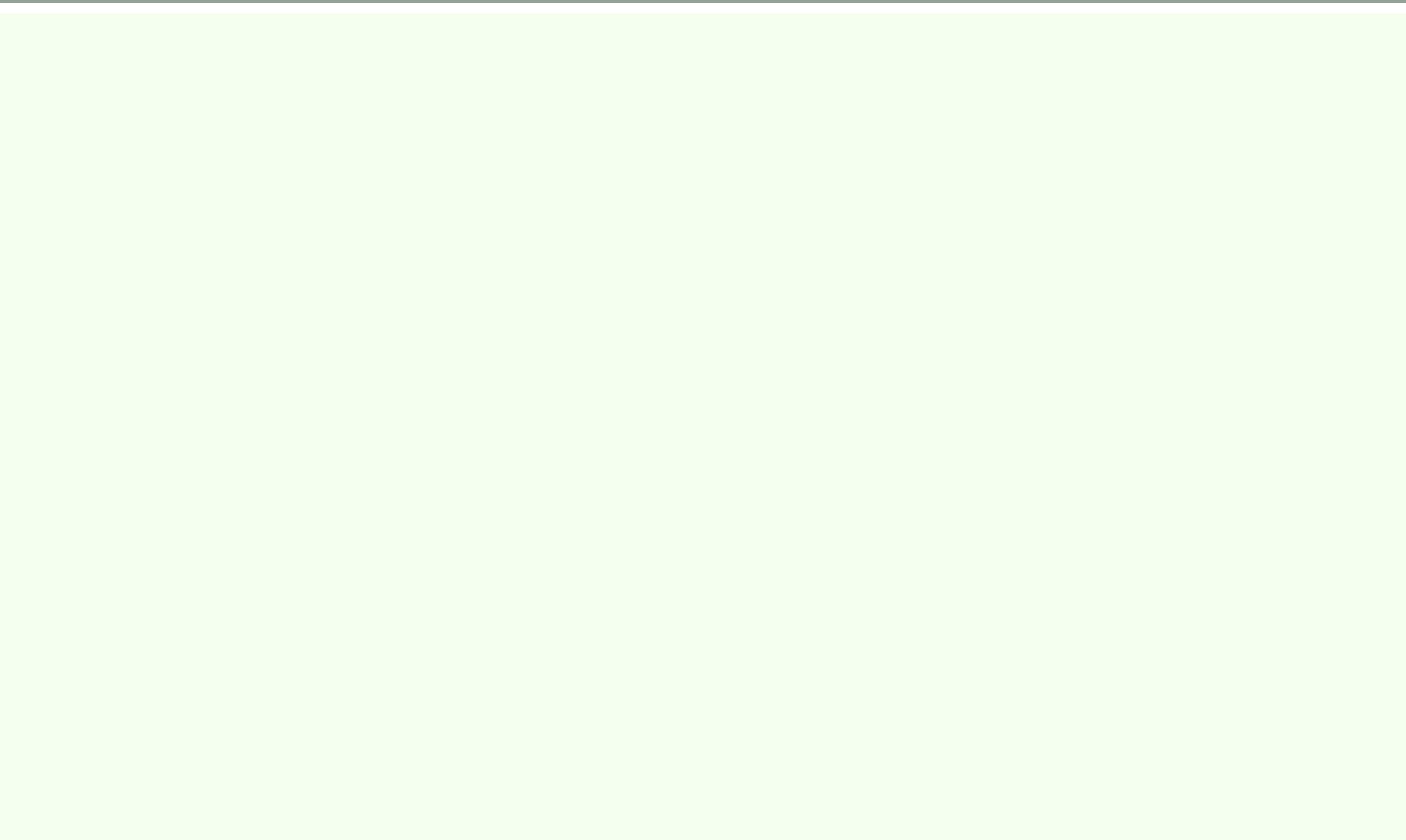


Stress exacerbates Rhinencephalon
response to differences

Chronic Stress



Vietnam veterans suffering from PTSD are prone to more aggressive behavior



The negative effect of the World Brain



The Sorcerer's Apprentice Effect

Paul Dukas



The Sorcerer's Apprentice
By Paul Dukas

The Sorcerer's Apprentice
(Extract) Paul Dukas

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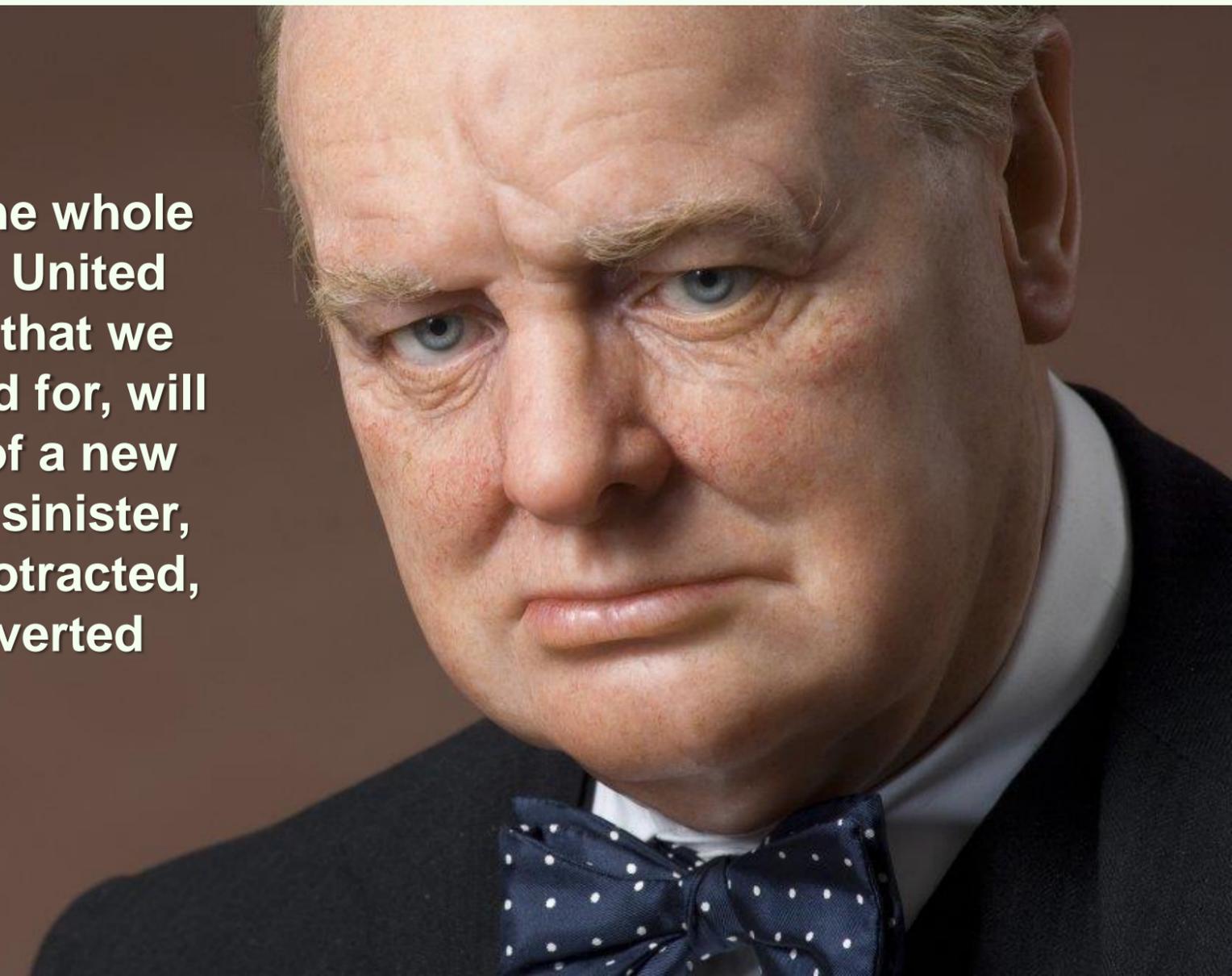


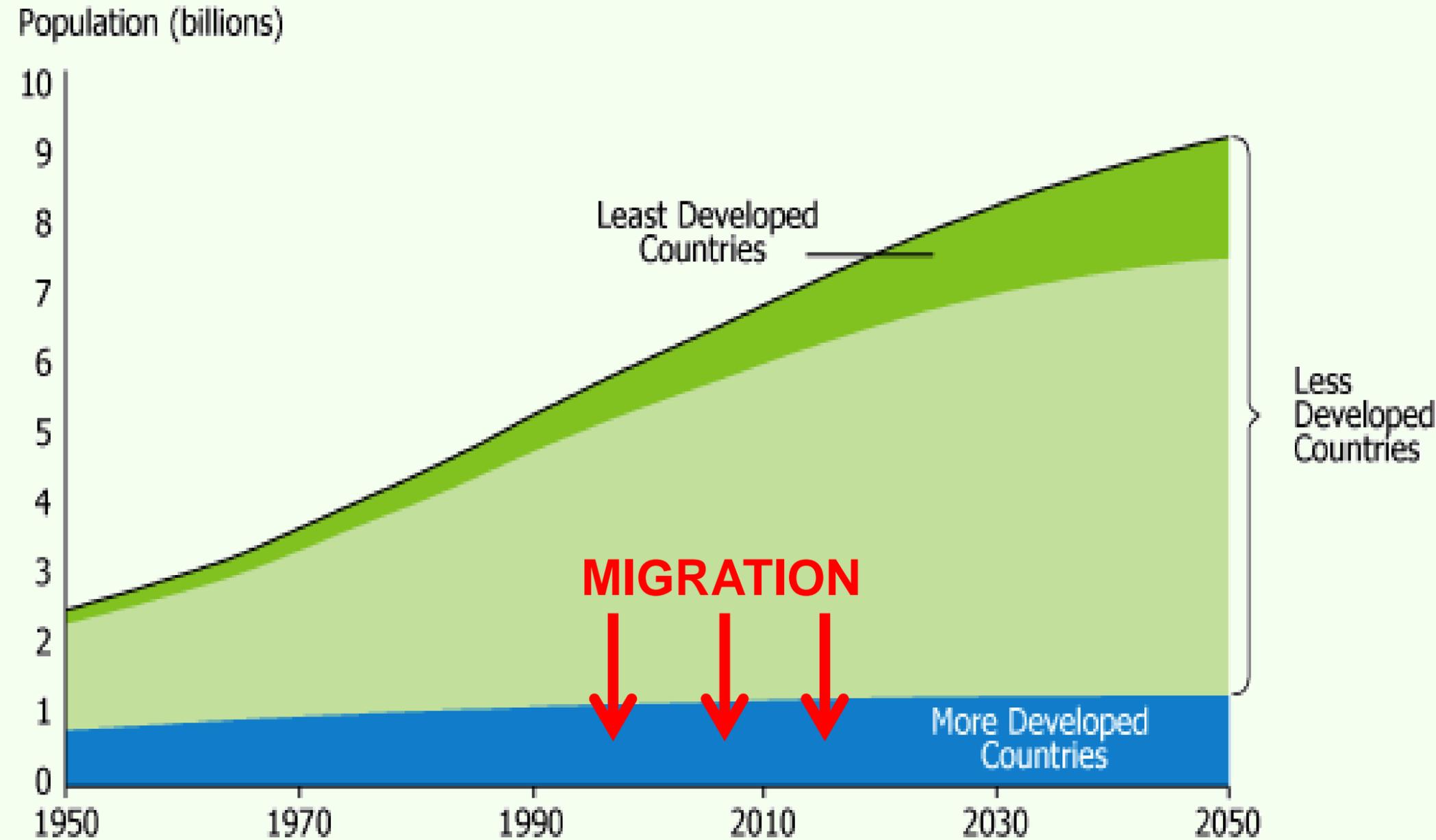
The fragmentation of World Brain between Nations and Cultures predisposes the misuse of its increasing and enormous power



Winston Churchill - 1940

"But if we fail, then the whole world, including the United States, including all that we have known and cared for, will sink into the abyss of a new dark age made more sinister, and perhaps more protracted, by the lights of perverted science."





Out of control reproduction and migration of humans (World Brain stem cells) in less developed countries without appropriate imprinting and hook-up to the World Brain is a **risk factor and precursor to Glioblastoma.**

By increasing economic distances the World Brain itself is at least an indirect cause of Glioblastoma



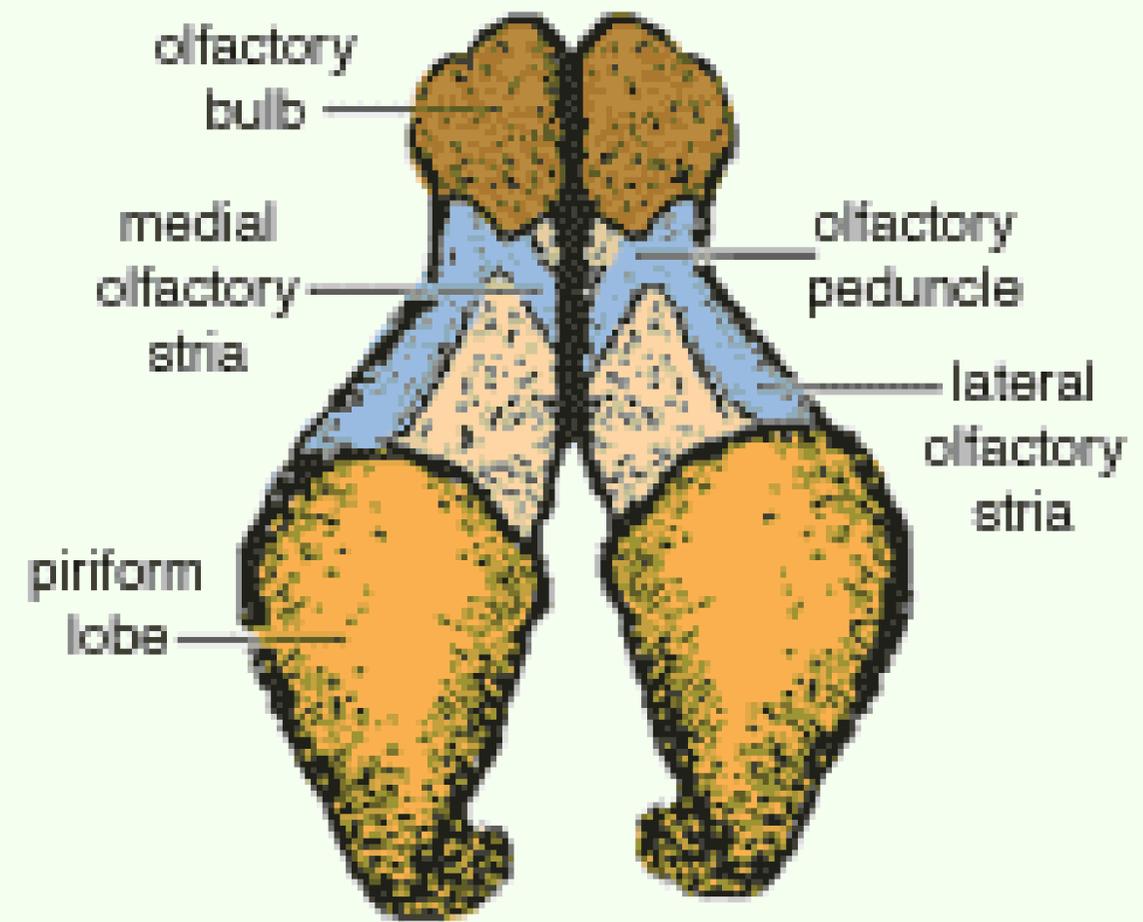
Physicians are committed to rational outcome analysis

VI

Cure of these diseases

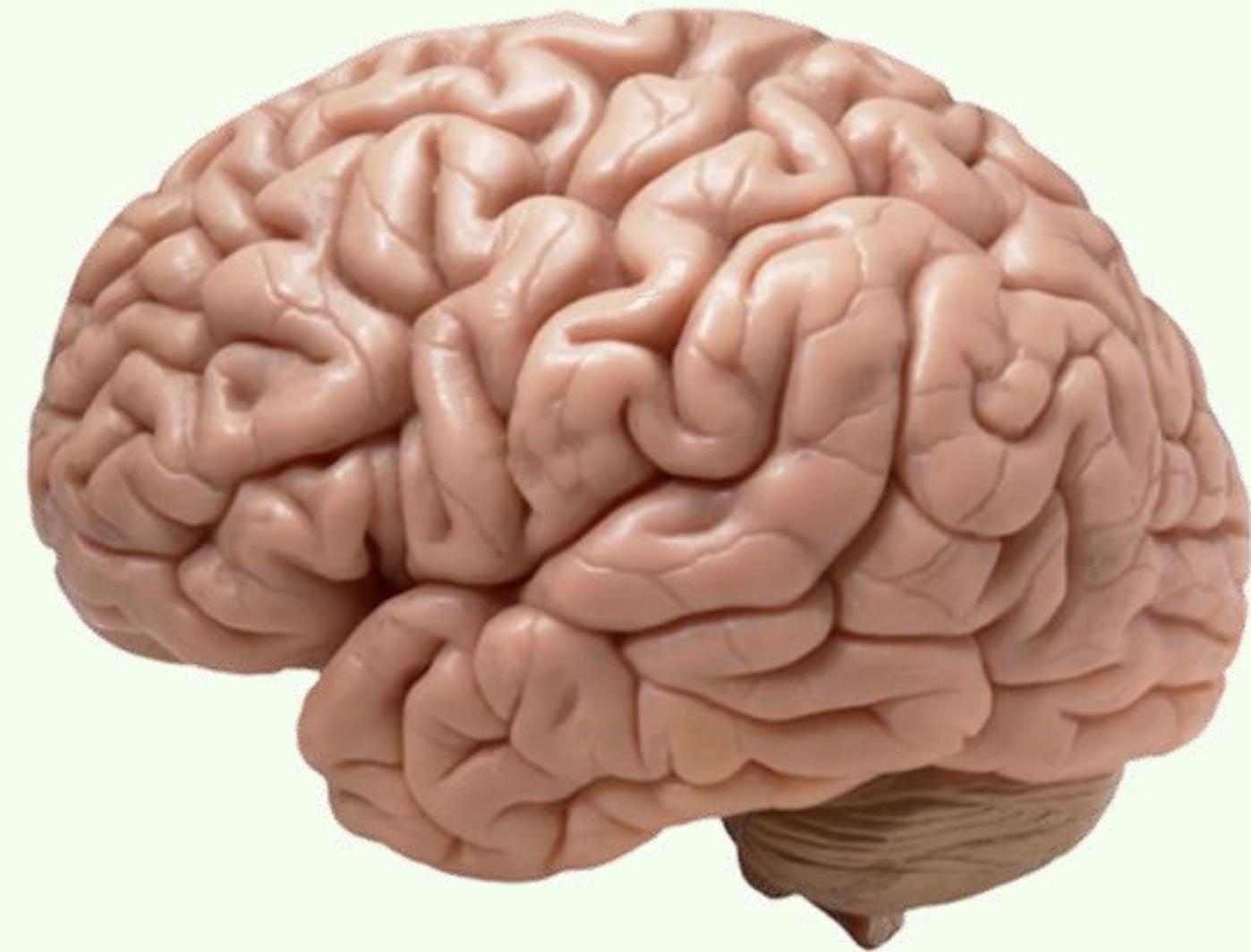
(Physicians treat the human brain we now suggest they consider efforts to heal the World brain)

Rhinencephalon



Rhinencephalon
(ventral view)

Neopallium



Selfishness is hardwired in human brain the same way as altruism

- The Selfish Gene, 1976, by Richard Dawkins, Oxford University press
- Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought, 1966 book by George C. Williams, Princeton University Press
- Ubiquitin – conserved protein or selfish gene? Catic A, Ploegh HL, Trends in Biochemical Sciences Volume 30, Issue 11, November 2005, Pages 600-604
- Selfish DNA: the ultimate parasite, L. E. Orgel, F. H. C. Crick, Nature April 1980, Volume 284, Issue 5757, pp 604–607
- How Hungry is the Selfish Gene? Anne Case, I-Fen Lin, Sara McLanahan, The Economic Journal, Volume 110, Issue 466 October 2000 Pages 781–804

Intrinsic Altruistic Nature of Humans Arising from the Neocortex

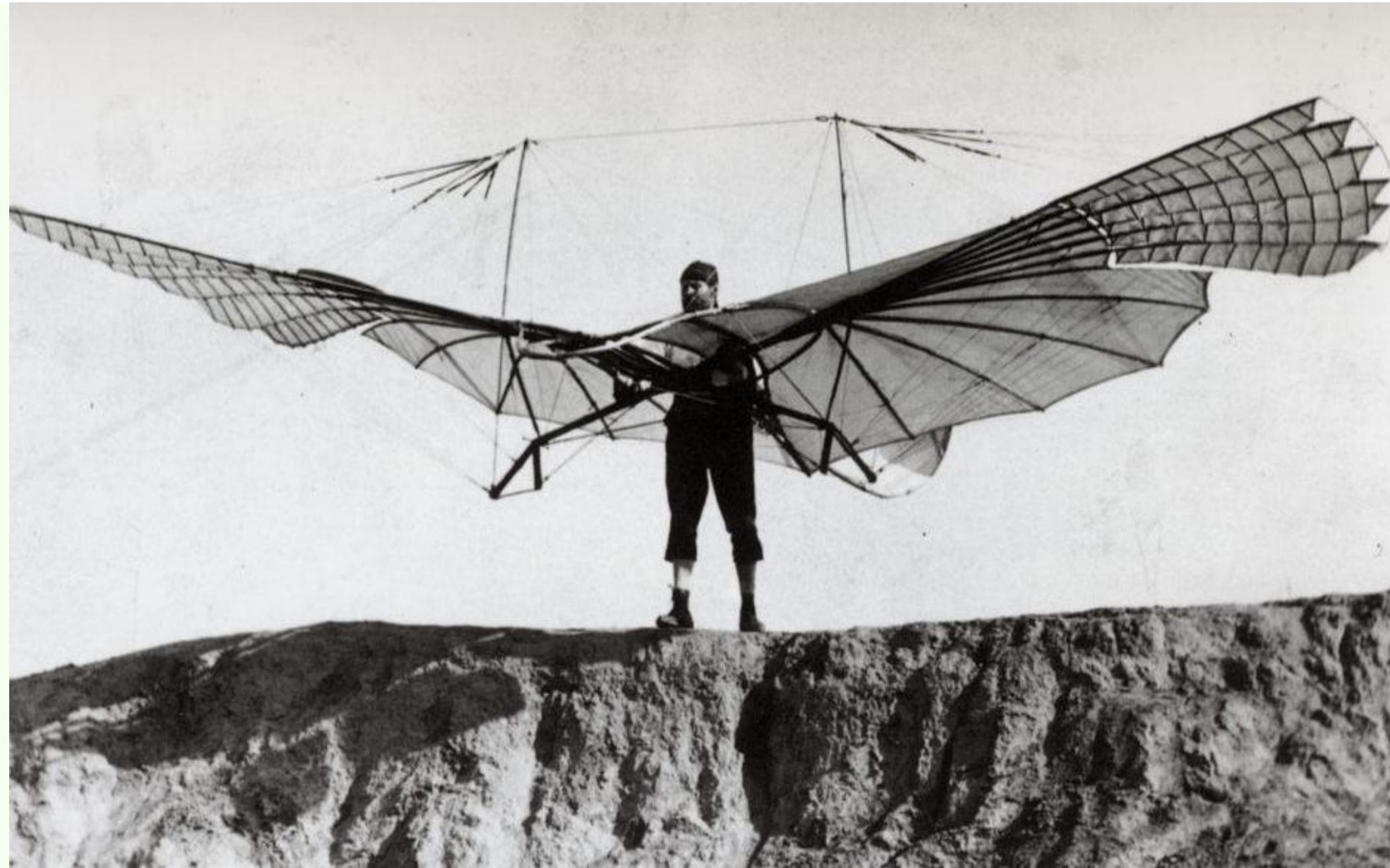
- Fehr, E & U. Fischbacher. “The Nature of Human Altruism.” *Nature* 425 (2003): 785-791. Online.
- Fehr, E. & B. Rothenbach. “Human Altruism: Economic, Neural, and Evolutionary Perspectives.” *Current Opinions in Neurobiology* 14.6 (2004): 784-790. Online.
- West, S.A., A.S. Griffin, & A. Gardner. “Social Semantics: Altruism, Cooperation, Mutualism, Strong Reciprocity, and Group Selection.” *Journal of Evolutionary Biology* 20.2 (2007): 415-432. Online.
- Barasch, A., E.E. Levine, J.Z. Berman, & D.A. Small. “Selfish or Selfless? On the Signal Value of Emotion in Altruistic Behavior.” *Journal of Personality and Social Psychology* 107.3 (2014): 393-413. Online.
- Kurzban, R., M.N. Burton-Chellew, & S.A. West. “The Evolution of Altruism in Humans.” *Annual Review of Psychology*. (2014) Online.

Rhinencephalon

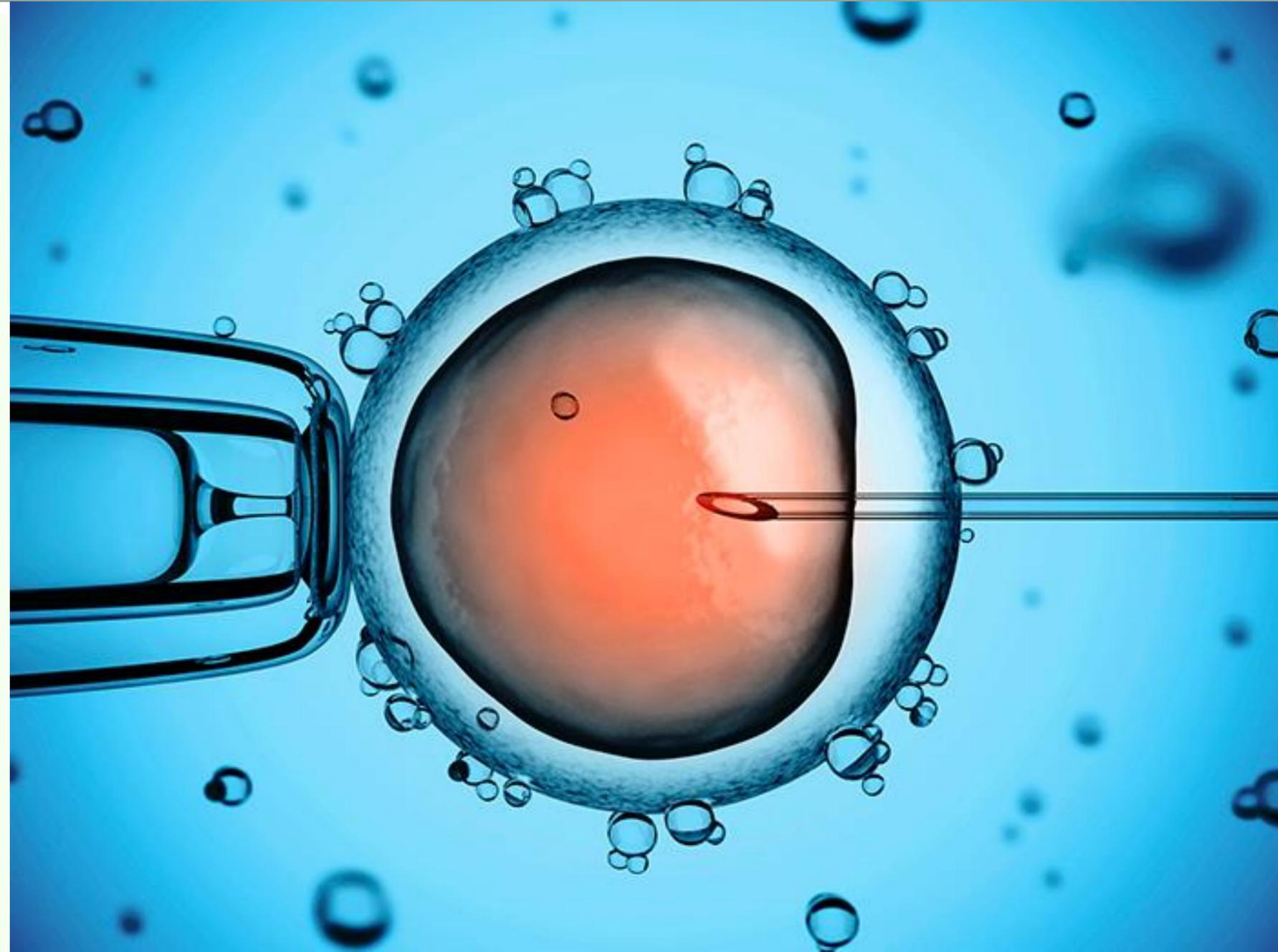


Neopallium



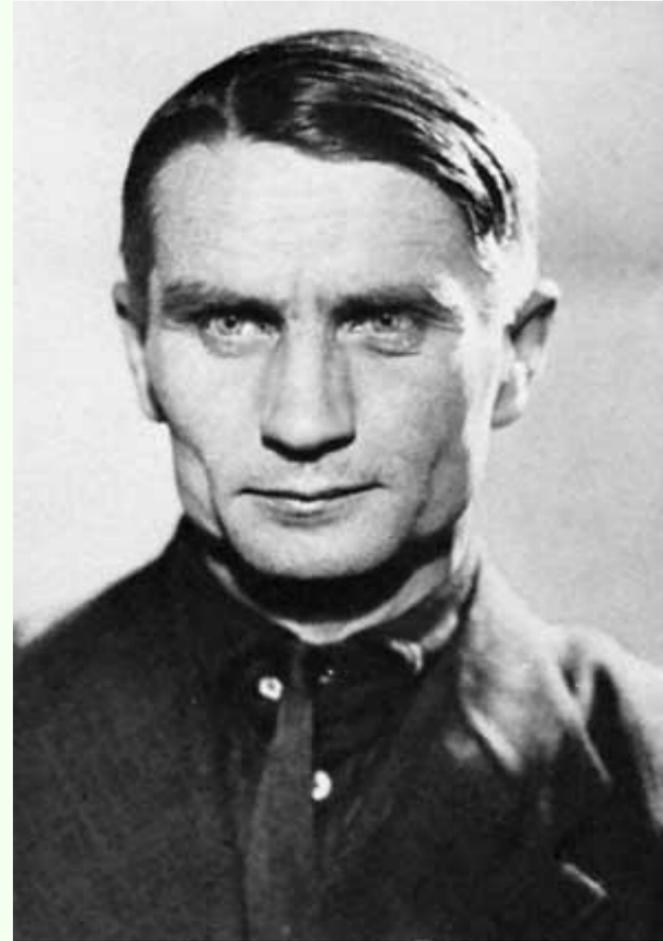


An impractical cure



- Evolutionary changes of DNA are too slow for current requirements
- Therefore, world brain must restructure itself – DNA modification
- Generally not an option

Trofim Lysenko
1898-1976



Lysenkoism - manipulation or distortion of the scientific process as a way to reach a predetermined conclusion as dictated by an ideological bias, often related to social or political objectives



На совещании передовиков урожайности по зерну, трактористов и машинистов молотильок с руководителями партии и правительства. Товарищи Сталин, Андреев, Микоян и Косигов слушают речь академика Т. Д. Лысенко.
Снимок сделан в Кремле 29 октября 1935 года. Фото М. Евдокимовича и П. Шульгина

Lysenko speaking at the Kremlin in 1935

Some better ideas

How to control these diseases? Increase of Neopallial influence

1. Understand the world brain
2. Understand rational errors
3. Utopia
4. Fabian strategy
5. Imprinting of new neurons
6. Social contract (trust)
7. Common worldwide law
8. Religion
9. Redistribution of world resources (with particular attention to healthcare and population growth restraint)

How to control these diseases? Minimize Rhinencephalon influence

10. Slowing down change
11. Isolation
12. Sports
13. Purgation
14. Common enemy
15. Diminishing threat perceptions
16. Control of the frontal lobe of the world brain (Checks and balances and rationality, possible increase of female influence?)

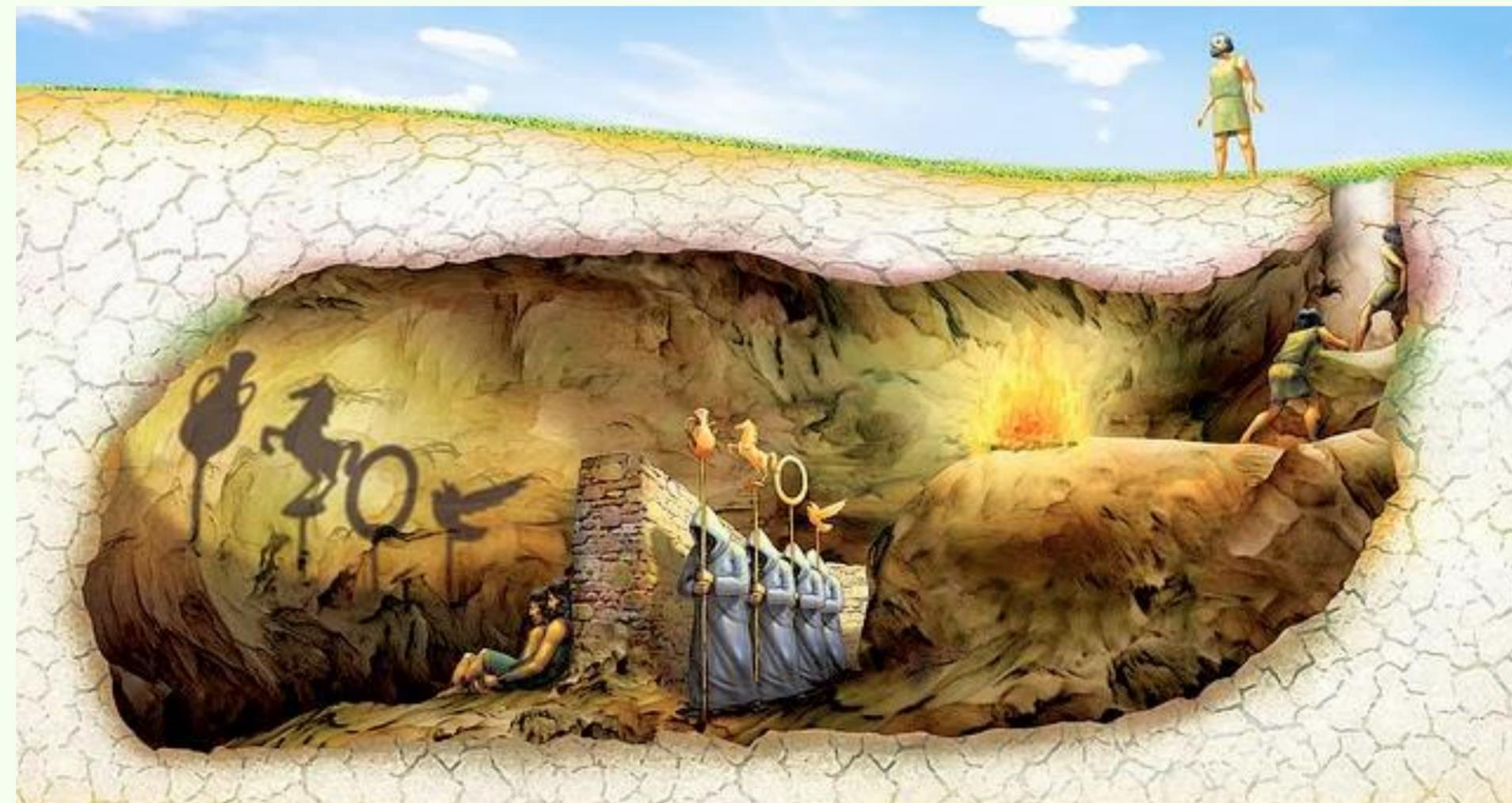
4 billion years of in utero development

Higher purpose - the world brain is about to be born

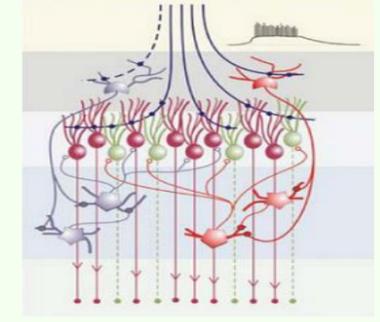
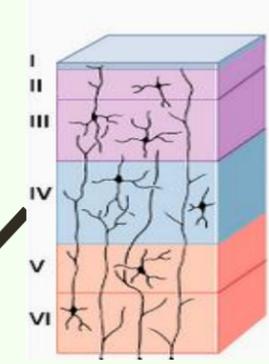


1. Understand the world brain

Human race is emerging from Plato's cave

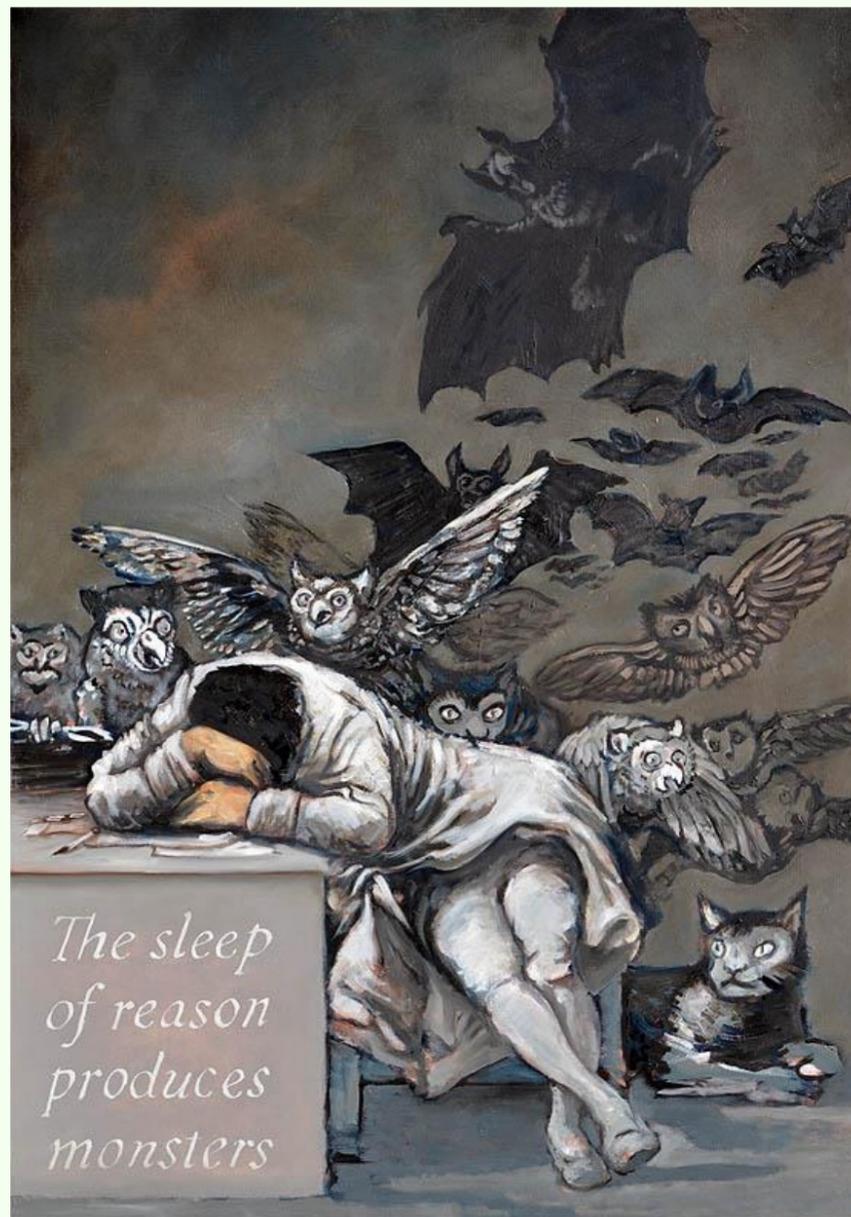


1. Understand the world brain



The Sleep of Reason

Goya 1797 A.D.



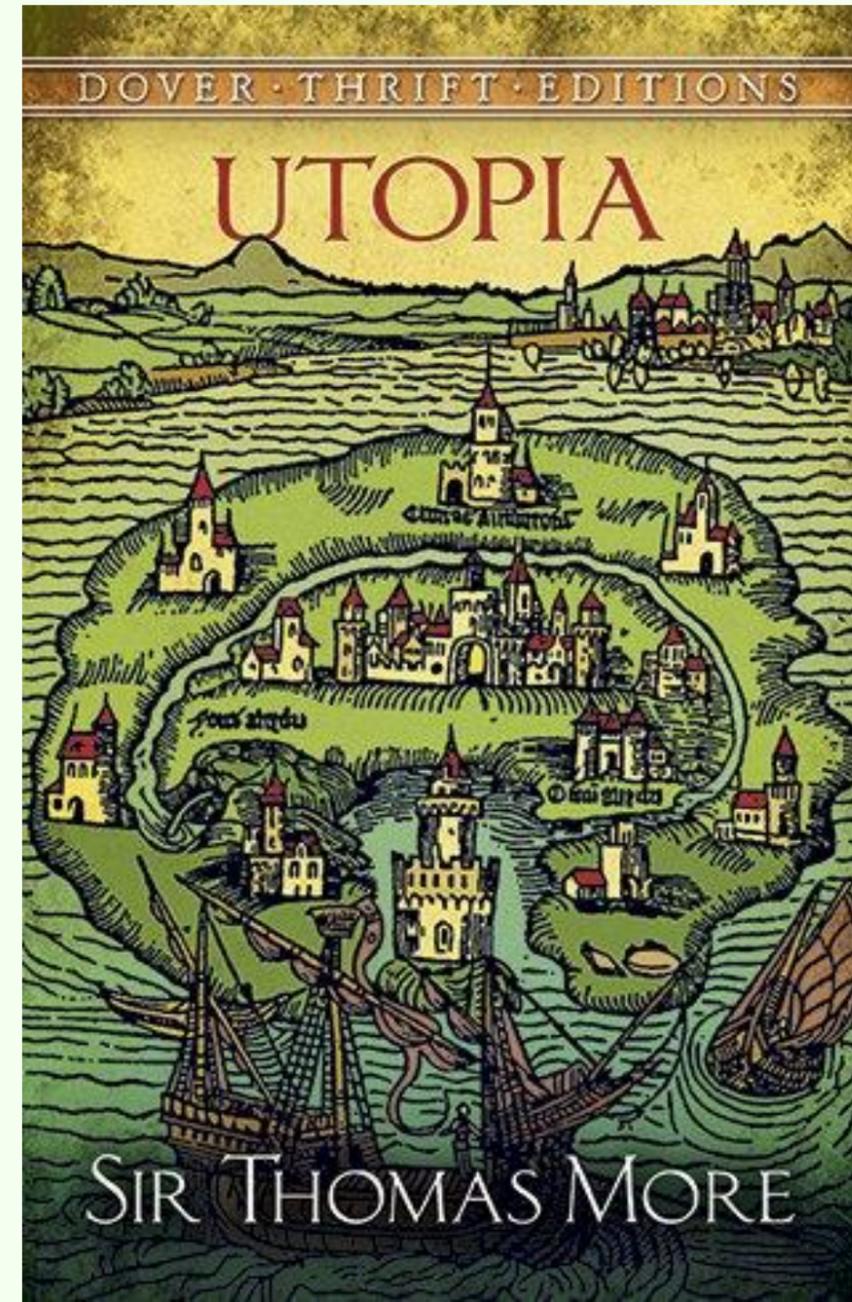
- From a phylogenetic point of view the **rhinencephalon (reptilian)** rose first followed by the **neocortex**
- The **neocortex** rose as the servant of the **rhinencephalon** – However, the **neocortex** endeavors to control the **rhinencephalon**
- Then the **World Brain** rose as the servant of the **neocortex** – however, the world brain has some pretensions of its own for downstream control.
- However, the **rhinencephalon** still endeavors to control both later entities

An average of 4,000 people a day are killed in China, as a result of the dense smog.

Source: Air Pollution in China: Mapping of Concentrations and Sources; R.A. Rohde, R.A. Muller, Public Library of Science.

2. Understand rational errors





3. Utopia



Sir Thomas More 1478-1535



Quintus Fabius Maximus
(280 BC – 203 BC)

4. Fabian strategy



Universities



5. Imprinting of new neurons Human viewpoints set at a younger age

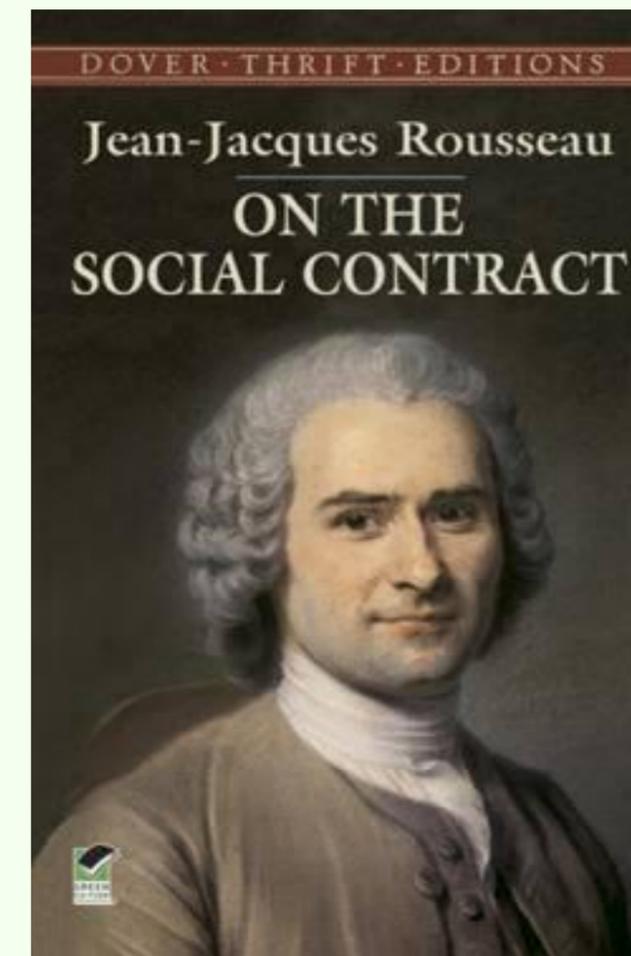


Egyptian Hieroglyphics – Royal Symbols

Symbol of a Pharaoh:
wearing the crown and holding crook and flail

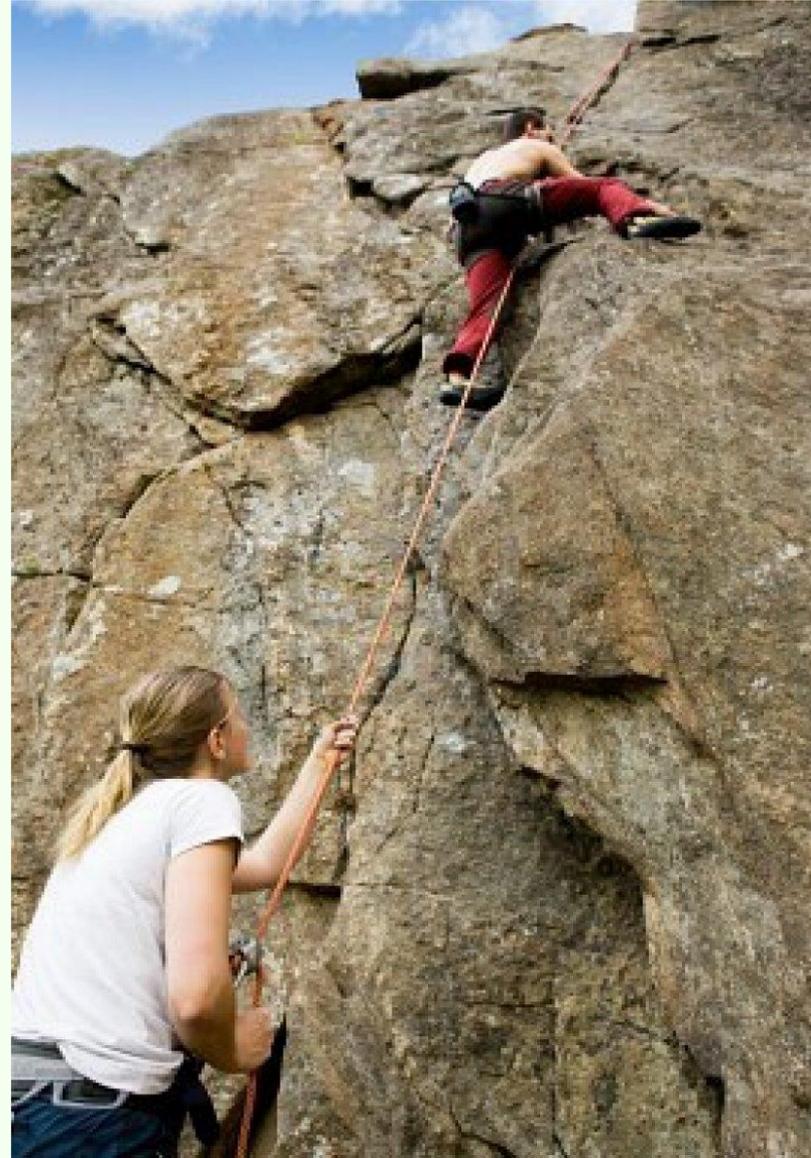


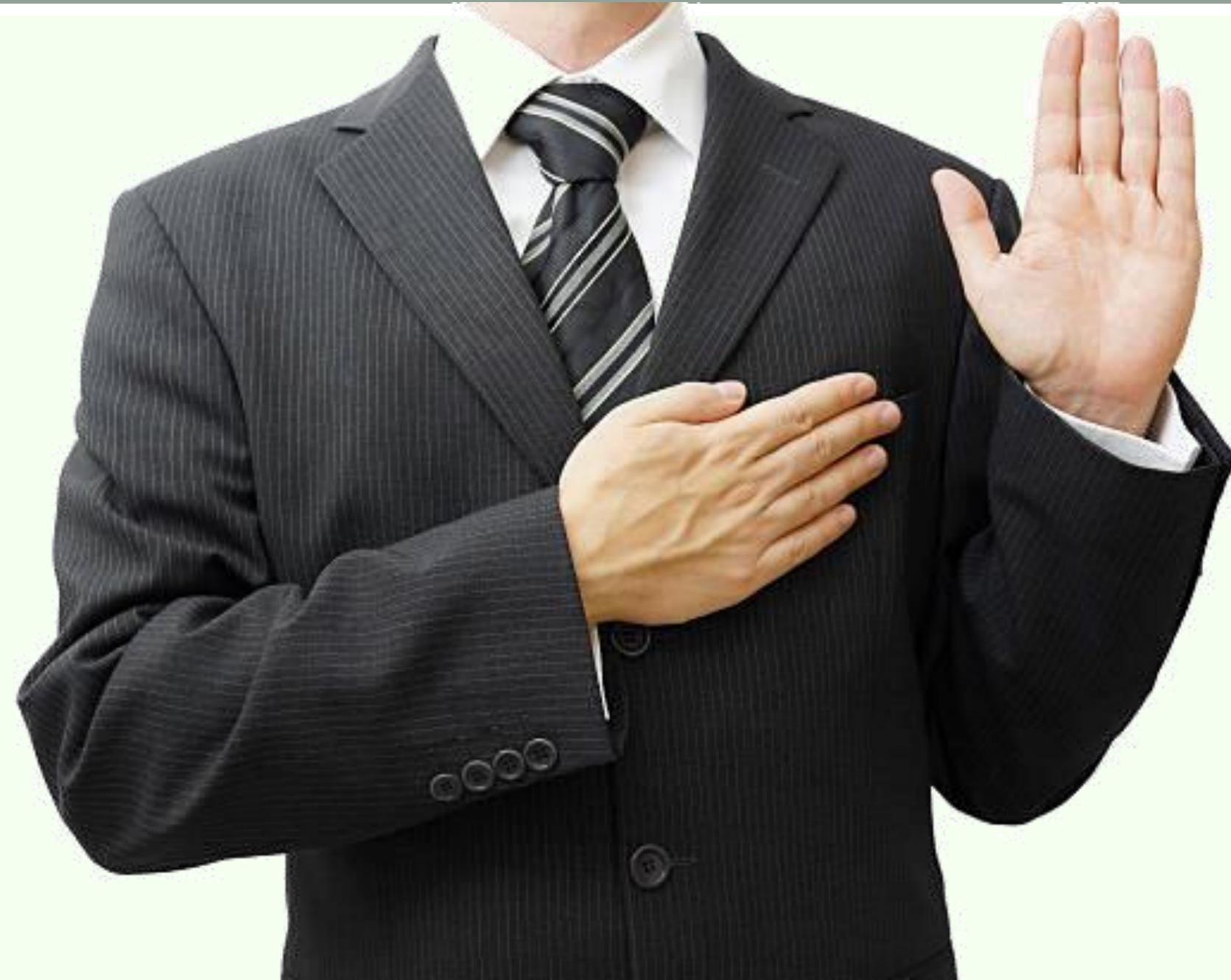
6. Social Contract (trust)



Jean-Jacques Rousseau

Trust





6. Social Contract

- Developed world's commitment to supply people in developing world
- Developing world's commitment to consider limiting childbirth and rational behavior

everywhere justice is ideally equal



7. Common worldwide law





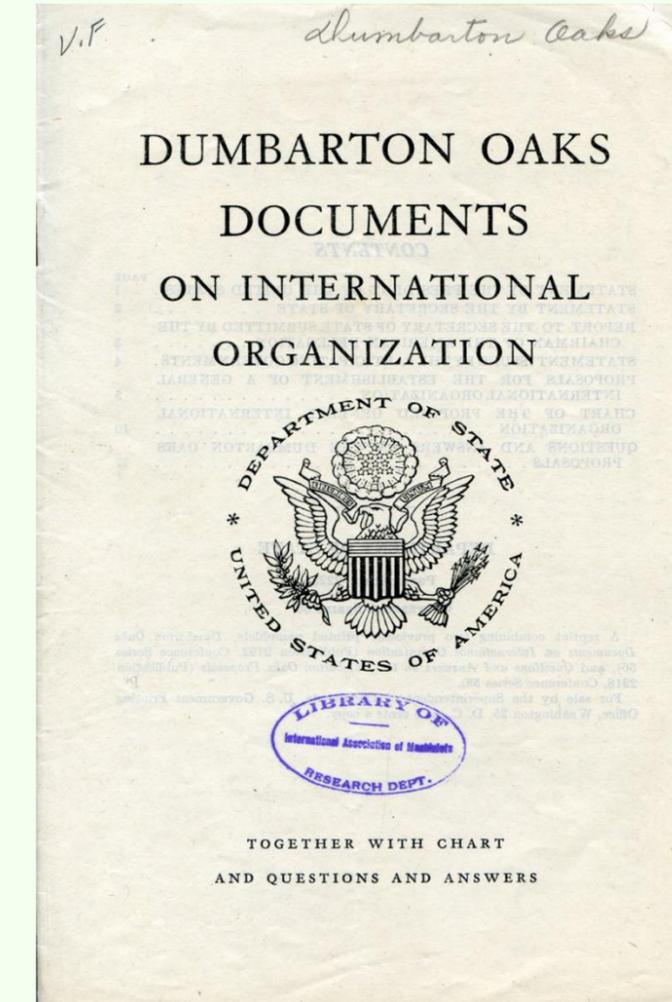
Dumbarton Oaks Conference



"We the Peoples of the United Nations,
determined to reaffirm faith in fundamental
human rights, in the dignity and worth of the
human person, in the equal rights of men and
women and of nations large and small..."

- —*United Nations Charter*

✓ World Peace Treaty



Altruistic collaboration



8. Religion



9. Redistribution of world resources (with particular attention to healthcare and population growth restraint)

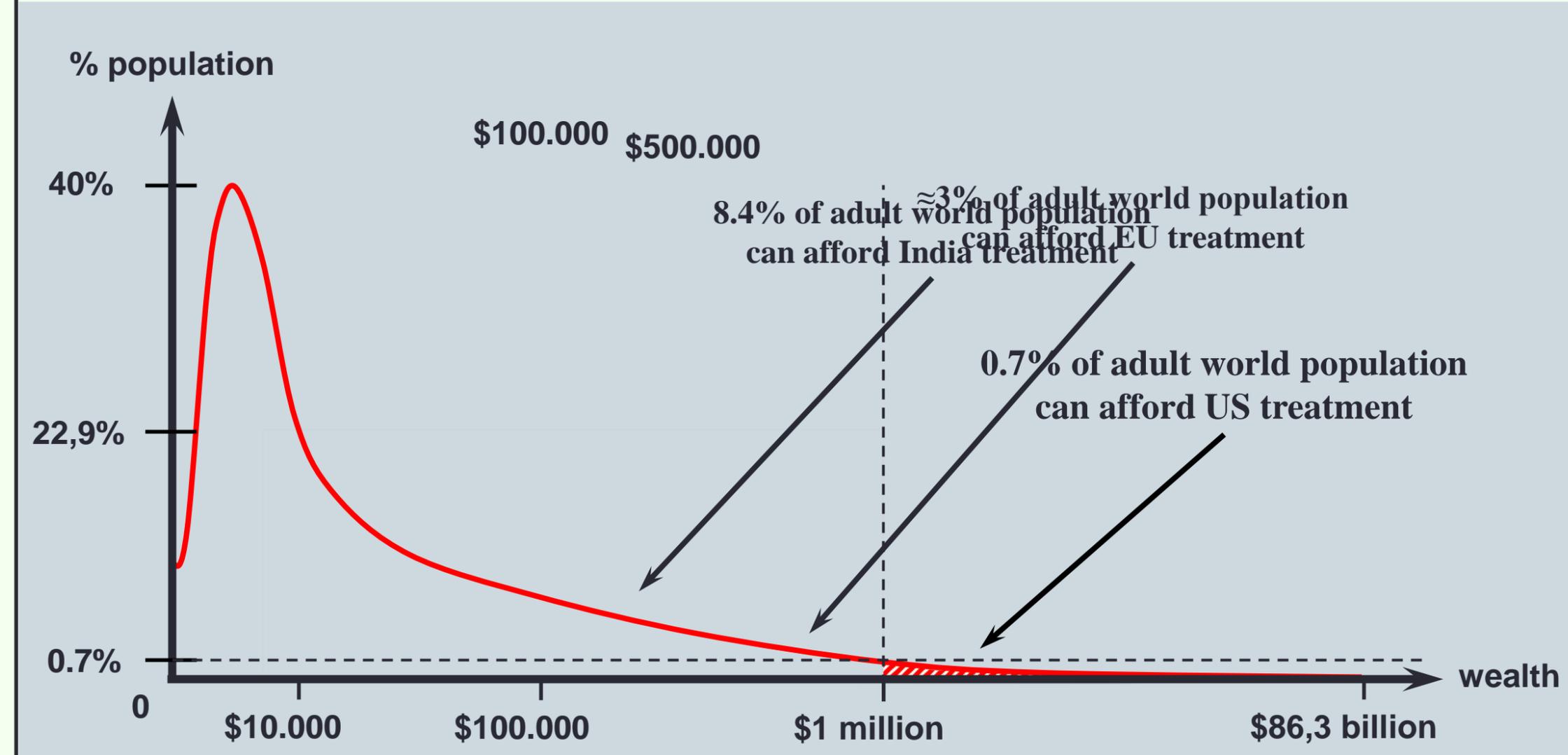


Total Value - \$256 trillion (Credit Suisse 2016)

GWP – \$77.9 trillion (CIA World Factbook 2014)

Health expenditure – \$9.5 trillion (World Bank/WHO 2015)

% of people who can independently pay for treatment of GBM



Thus, we beg the question

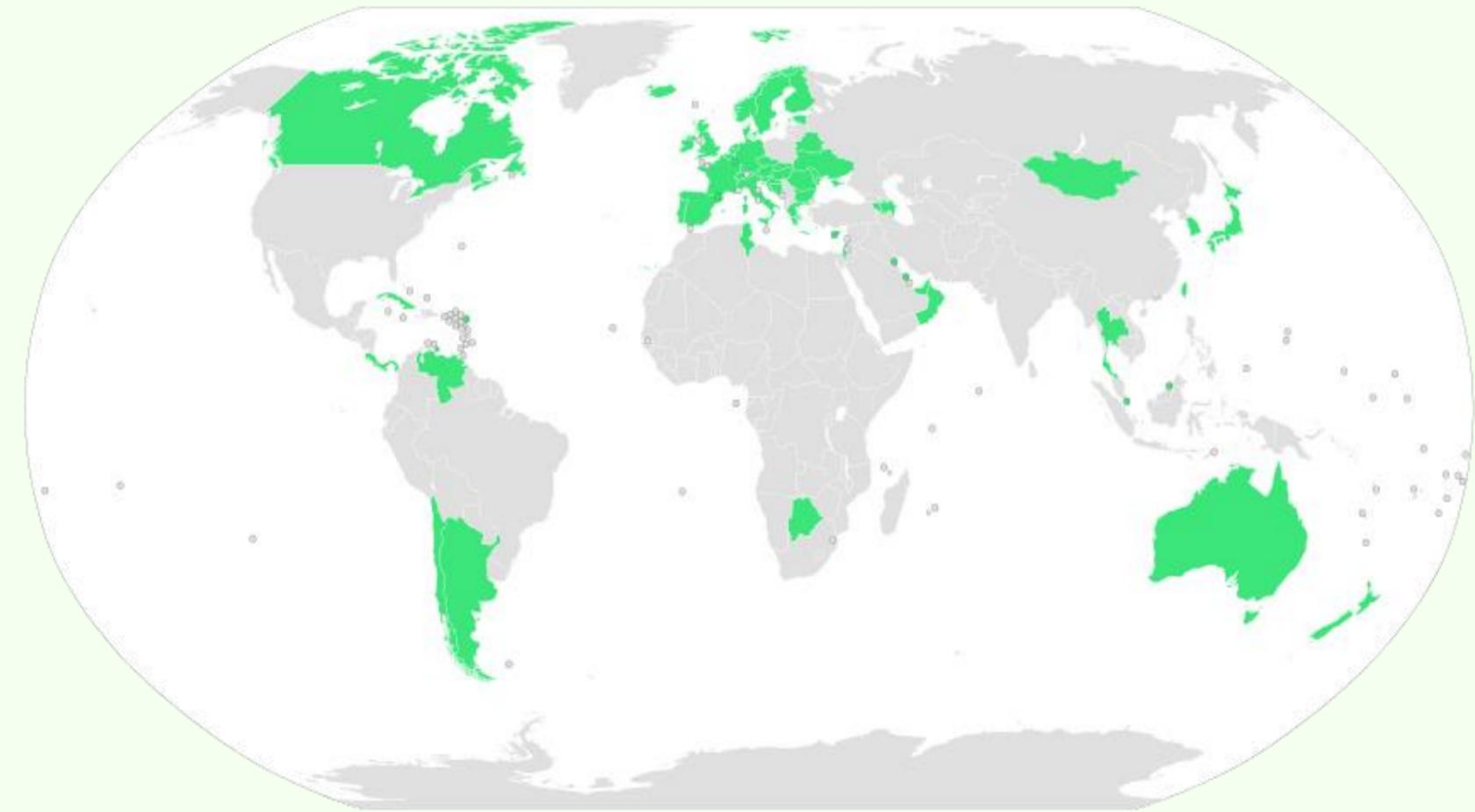


Is Equal Healthcare a Human Right...?

- Is Healthcare a human right across national and political boundaries?
- As much as reexamined ethics demand personal freedom, new attention may well require healthcare reallocation

✓YES

Universal healthcare, but not across borders



58 countries with universal health care in 2009.
58 countries with legislation mandating universal health care, along with > 90% health insurance coverage, and > 90% skilled birth attendance.



Minimize Rhinencephalon influence

Shiva:
Hindu God of
Destruction



10. Slowing down change
(the World Brain engenders often painful change)

Air Force Centrifuge – 9G



Air force pilot under 9G acceleration

Individual world brain neurons are getting destabilized, which causes neurosis

Escape Velocity Approaches



MENDING WALL

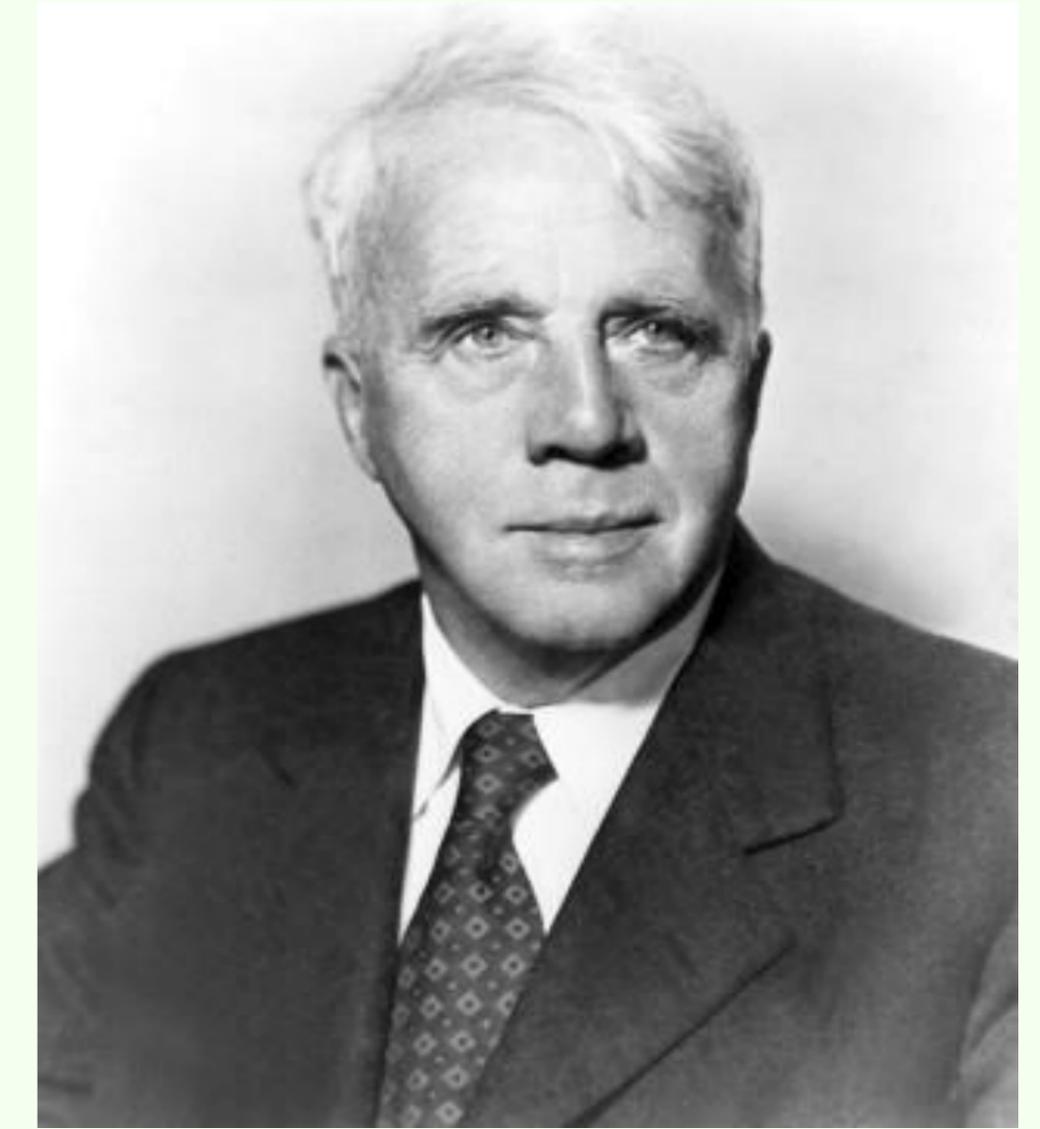
*...There where it is we do not need the wall:
 He is all pine and I am apple orchard.
 My apple trees will never get across
 And eat the cones under his pines, I tell him.
 He only says, **"Good fences make good neighbors."**
 Spring is the mischief in me, and I wonder
 If I could put a notion in his head...*



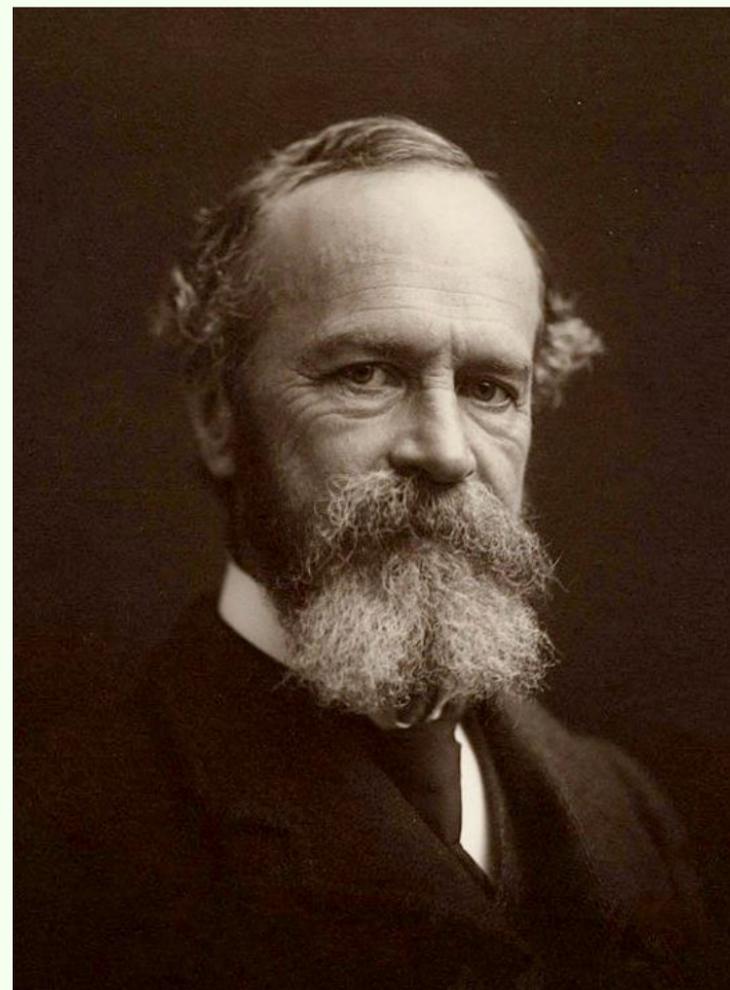
11. Isolation – sword with two edges

Robert Lee Frost

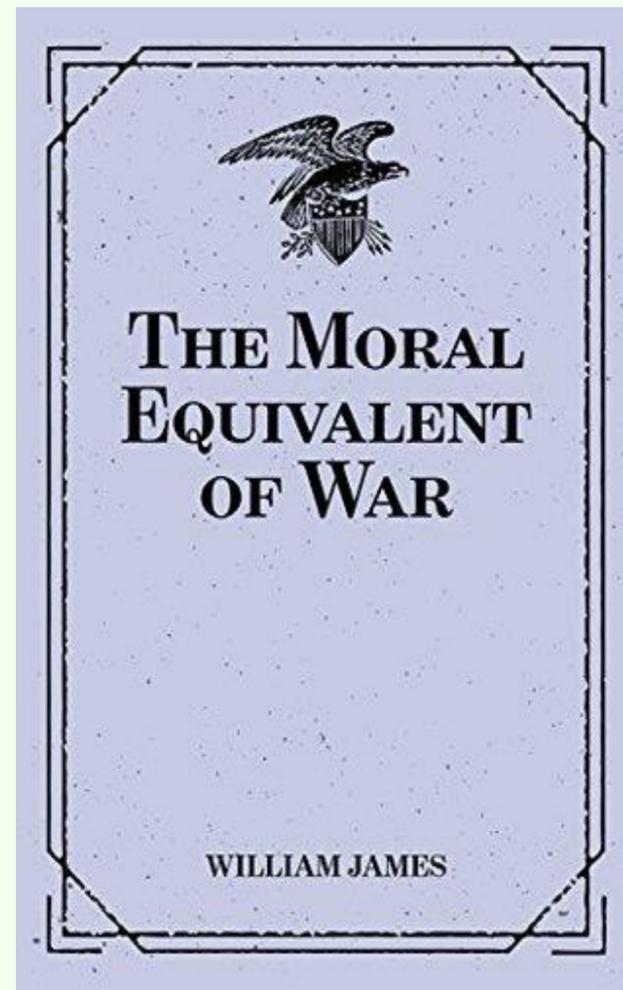
1874-1963



The Moral Equivalent of War



William James

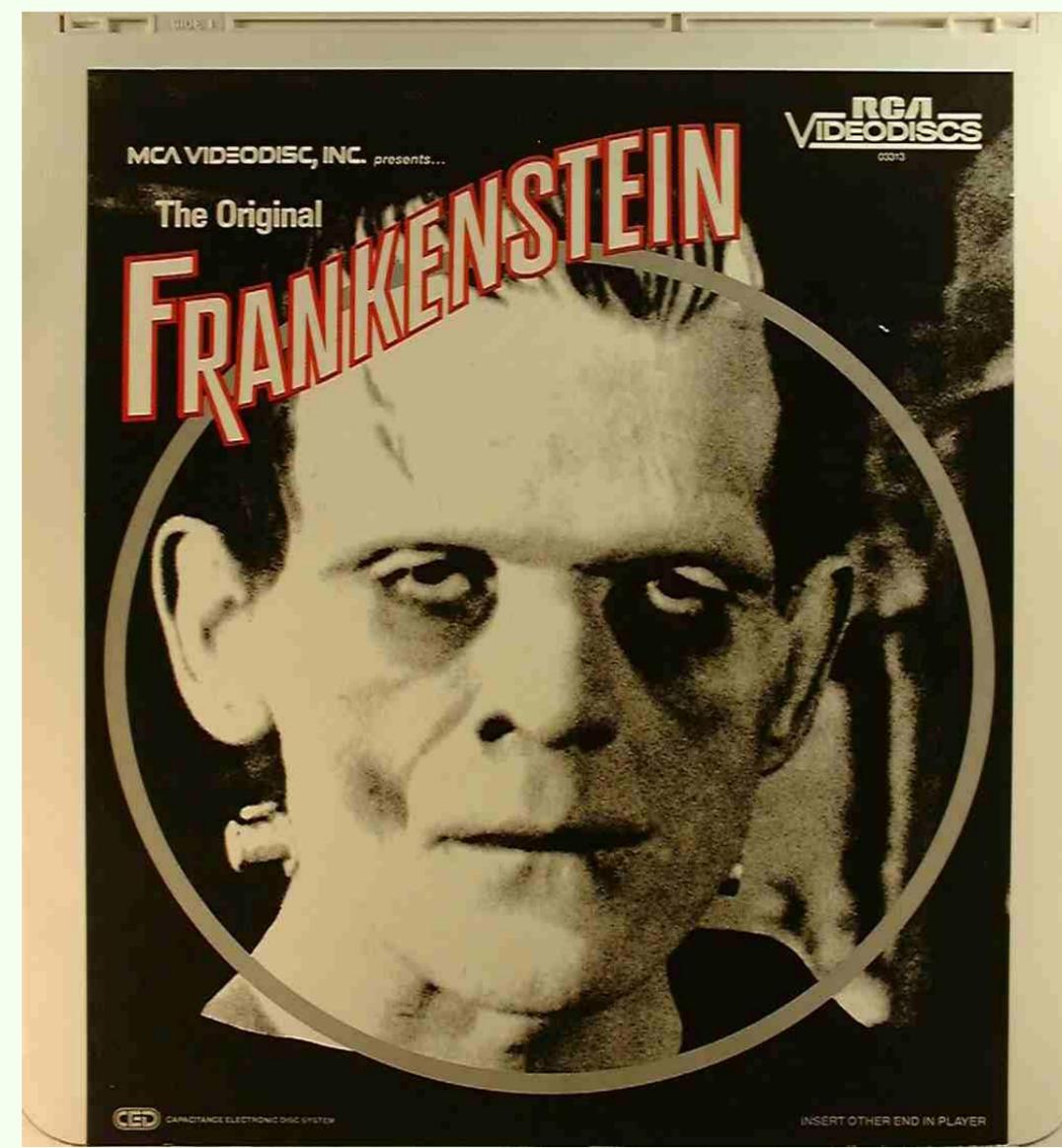


1910

12. Sports



13. Purgation



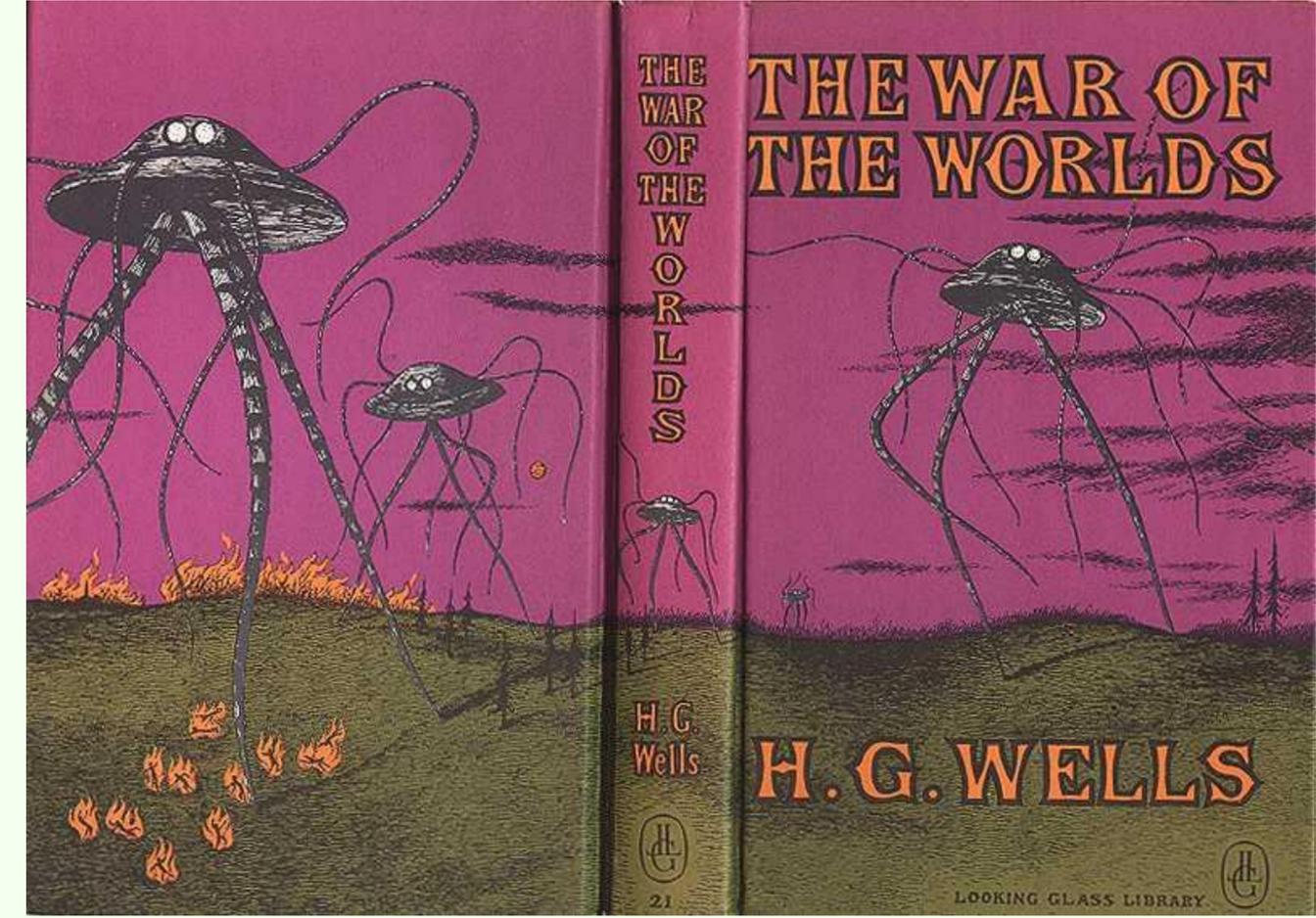
13. Purgation



Elbe River handshake of U.S. soldiers and Russian troops



14. Common enemy



1898

15. Diminishing threat perceptions

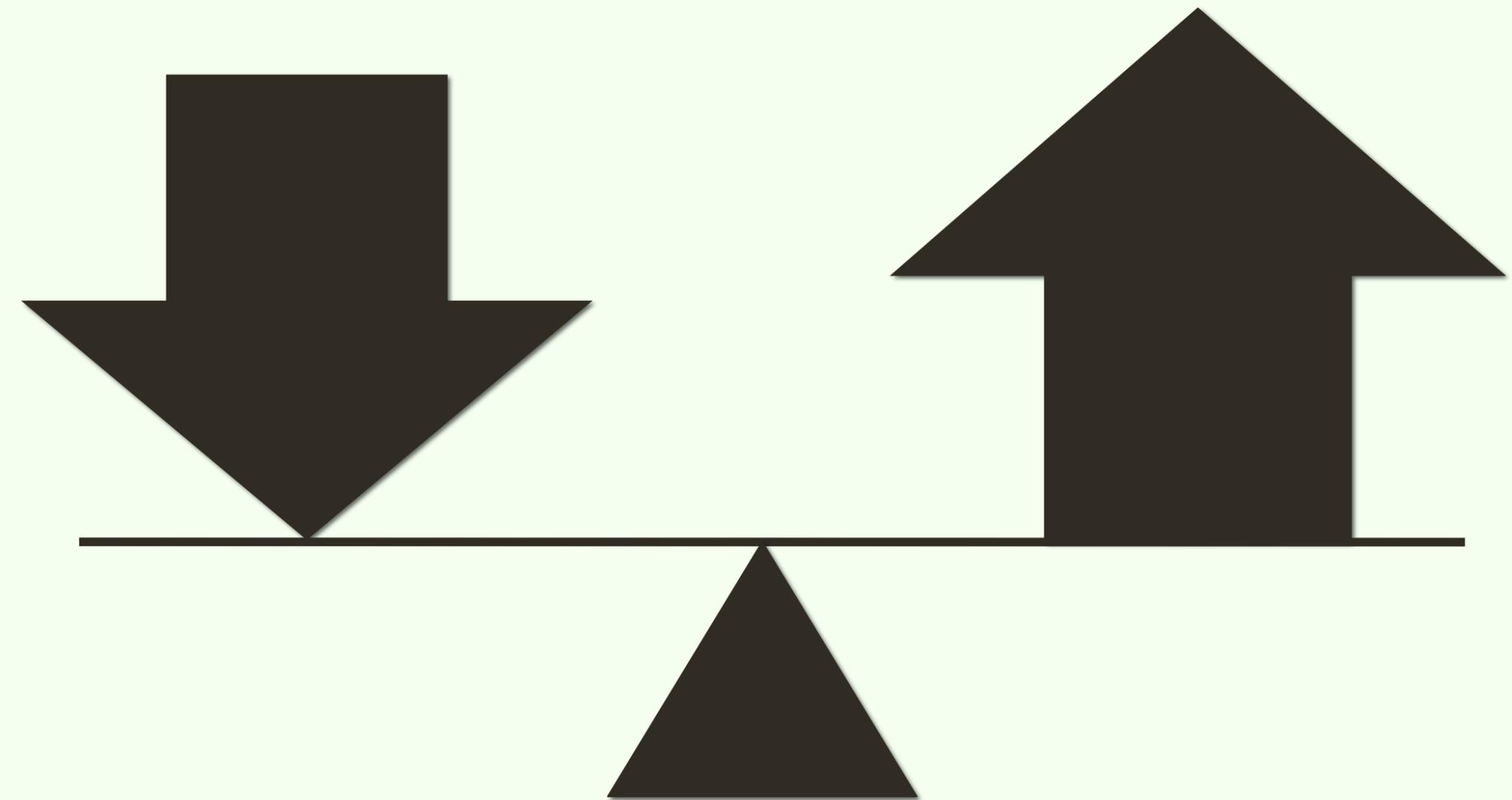


The Individual and The Group



16. Control of the frontal lobe of the world brain
(Checks and balances and rationality, possible
increase of female influence?)

Balance - The Golden Mean

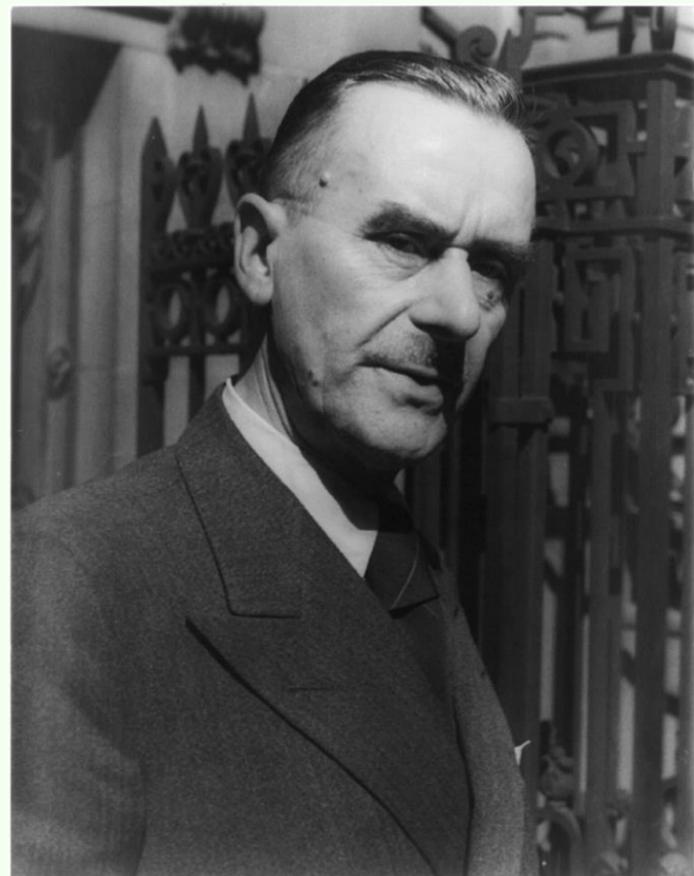


Checks and Balances

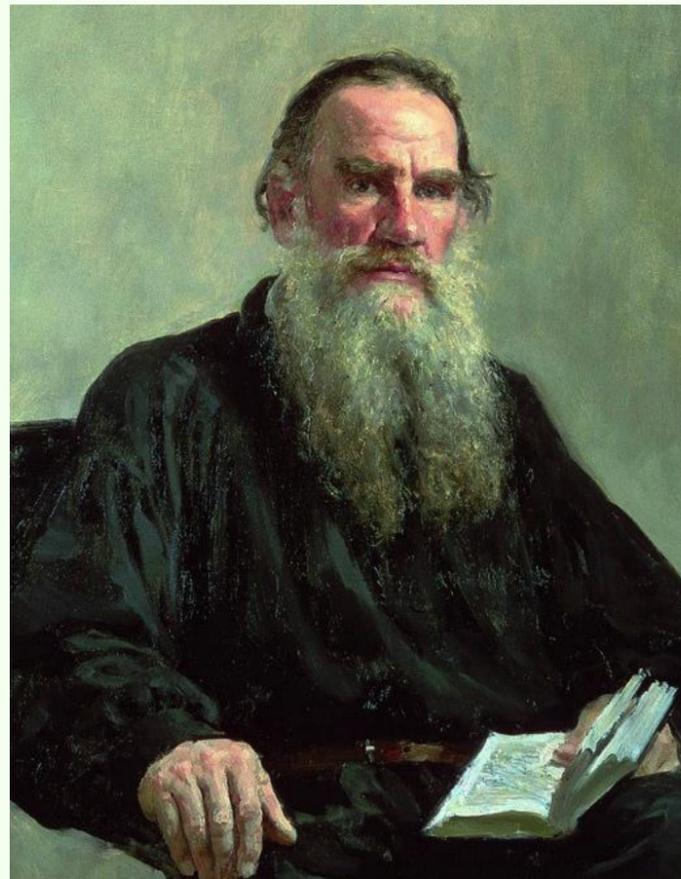


Decrease Rhinencephalon

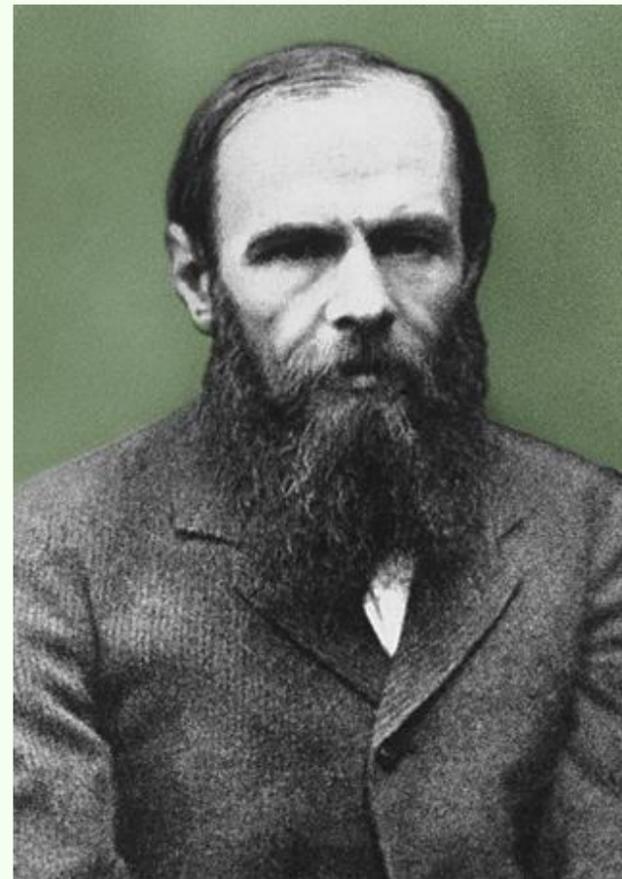
Decrease Rhinencephalon



Thomas Mann



Leo Tolstoy



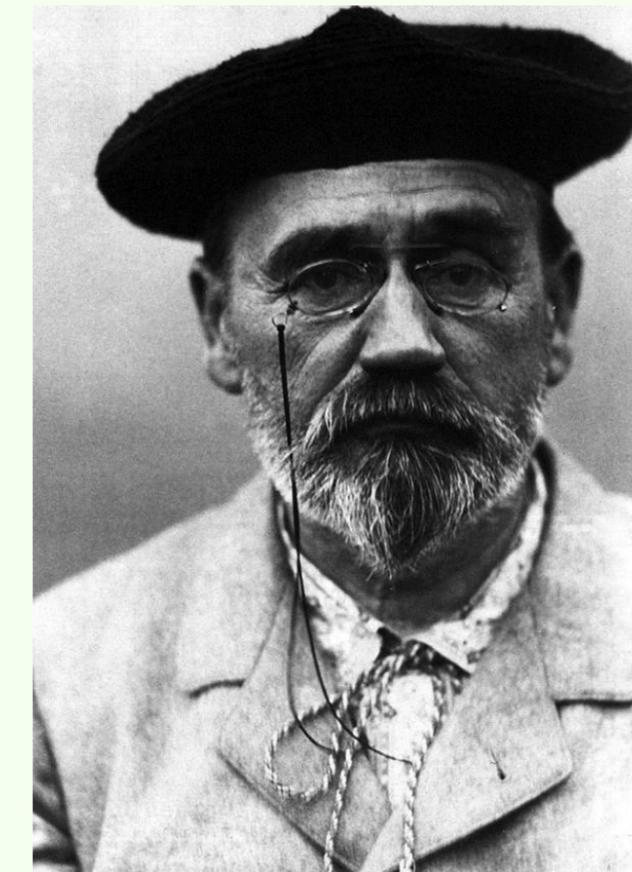
Fyodor Dostoevsky



Charles Dickens

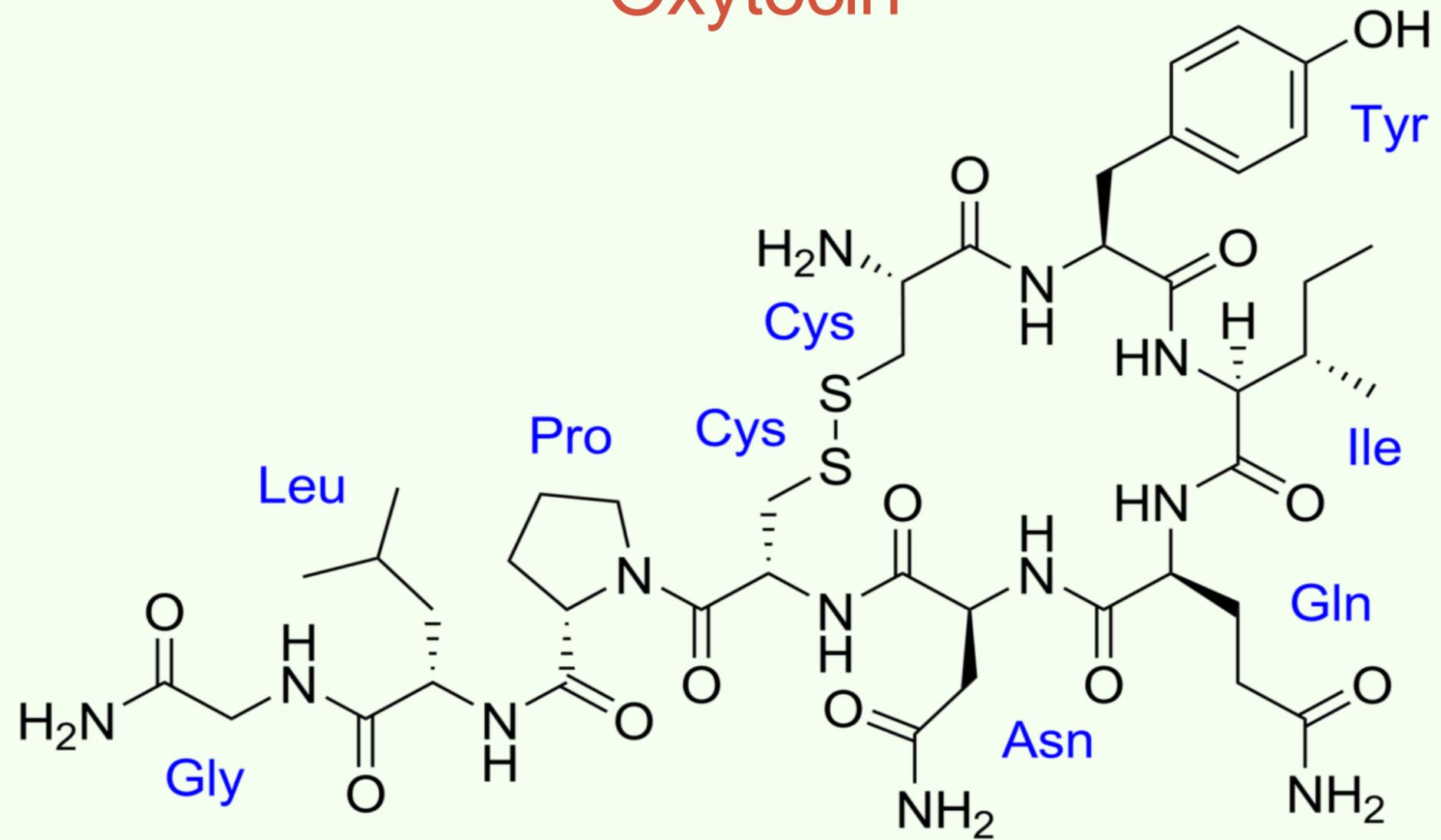


Sinclair Lewis

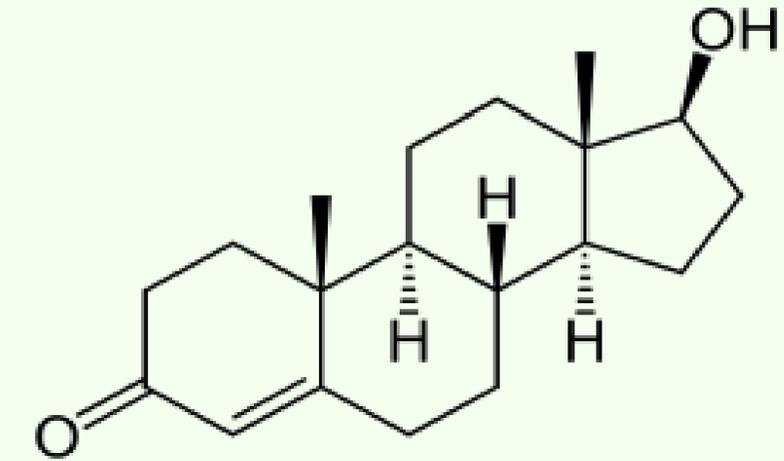


Émile Zola

Oxytocin



Testosterone



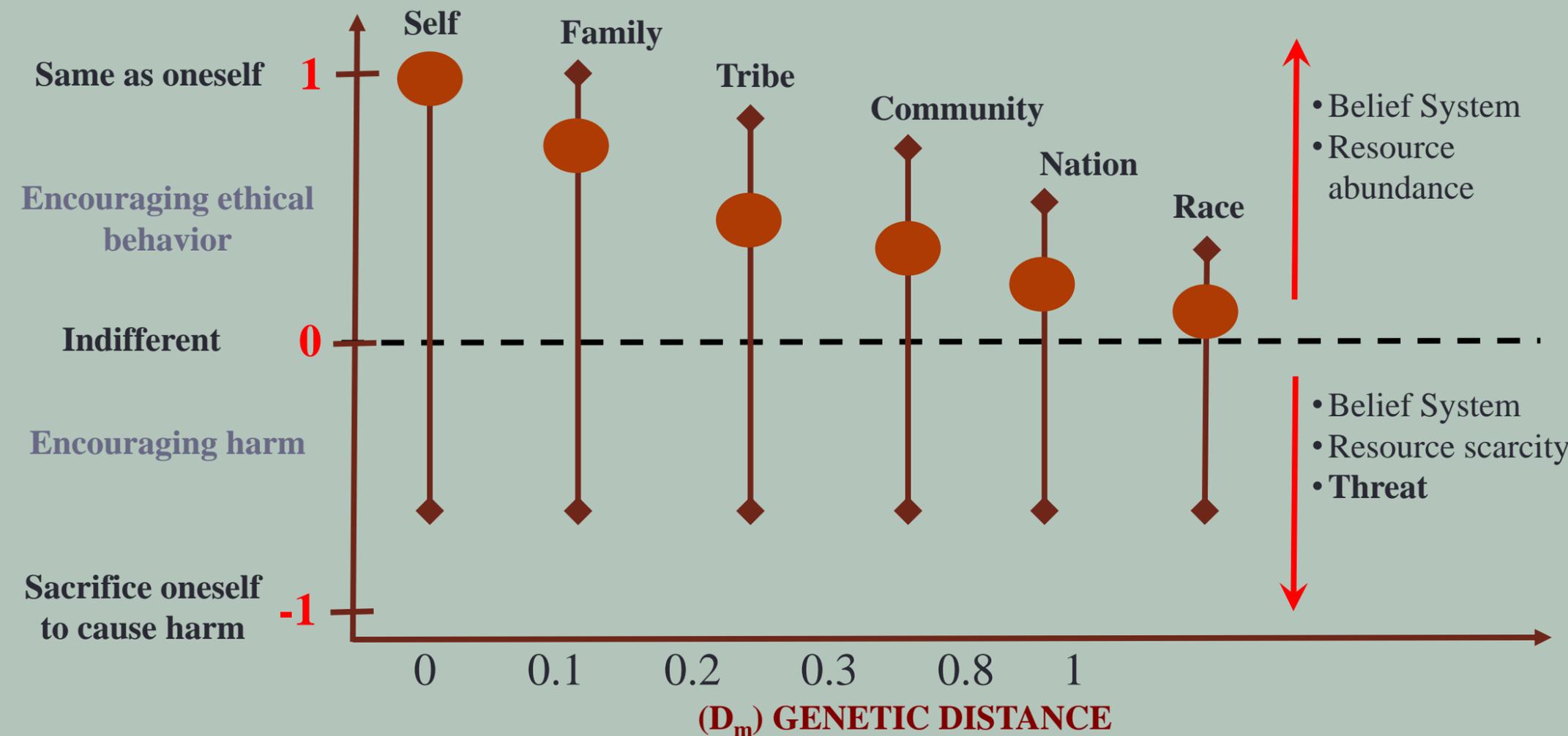
VII

Markers of cure success

Efforts towards the measurement of altruistic coefficient (globally and locally)

D_m – coefficient of genetic distance within one species
 0 - represents complete match (identical twins)
 1 - represents complete mismatch (unrelated race)

ALTRUISM COEFFICIENT



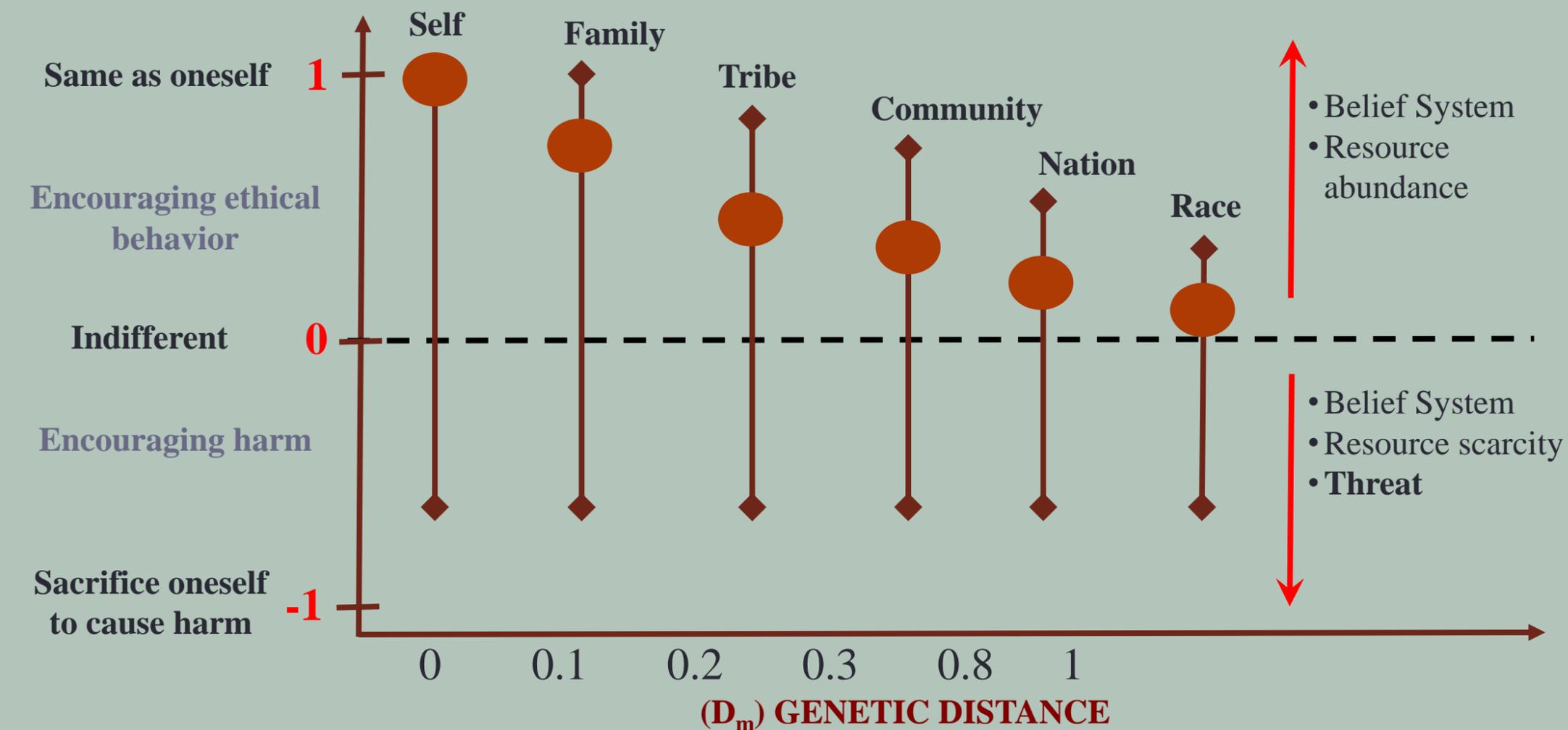
Outcome Assessment

Altruism coefficient at a given time period can be measured using numerical values, e.g.

1. Genetic distance of populations
2. Amount of charity in the world
3. Crime statistics
4. Number of hate speeches, etc

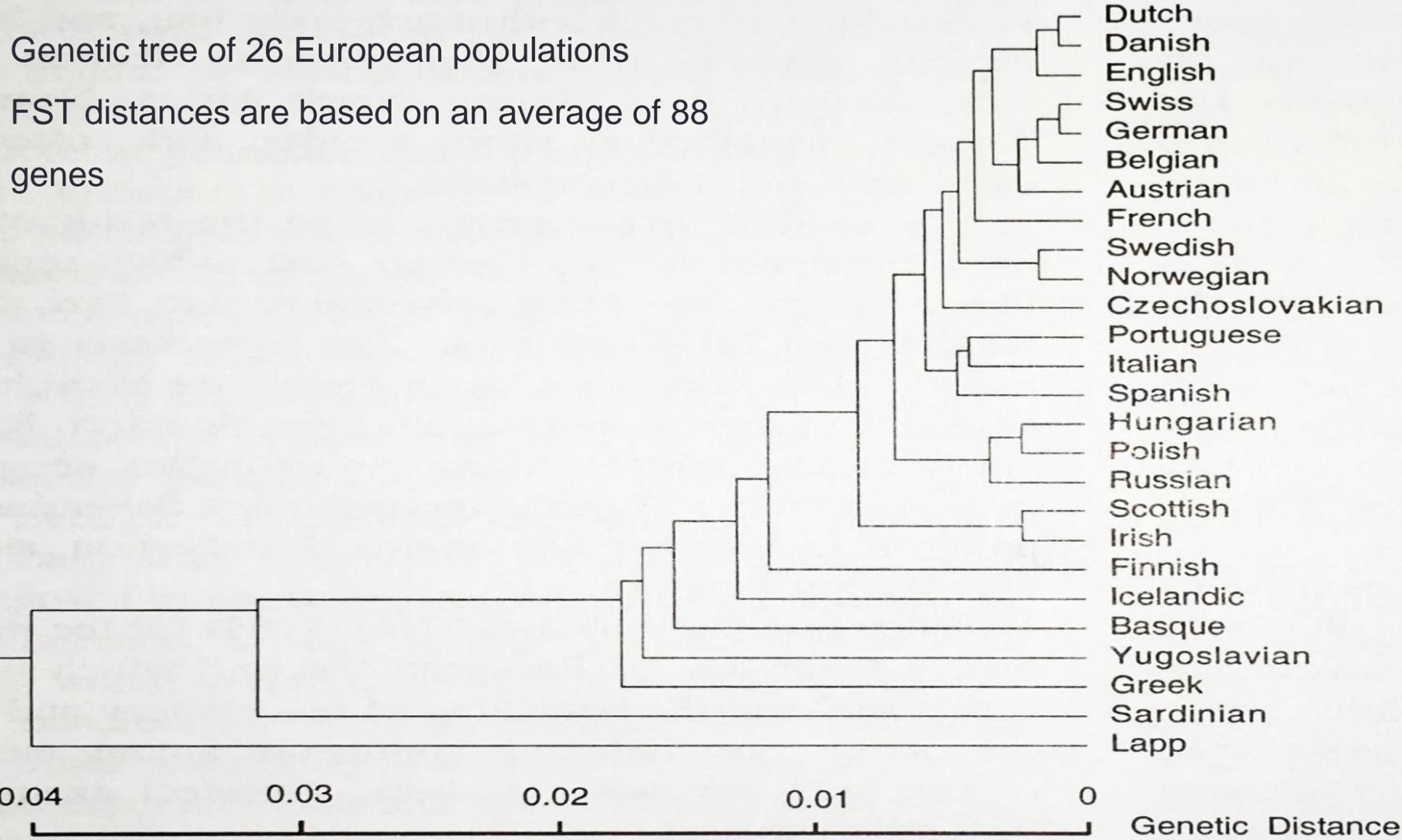
D_m – coefficient of genetic distance within one species
0 - represents complete match (identical twins)
1 - represents complete mismatch (unrelated race)

ALTRUISM COEFFICIENT



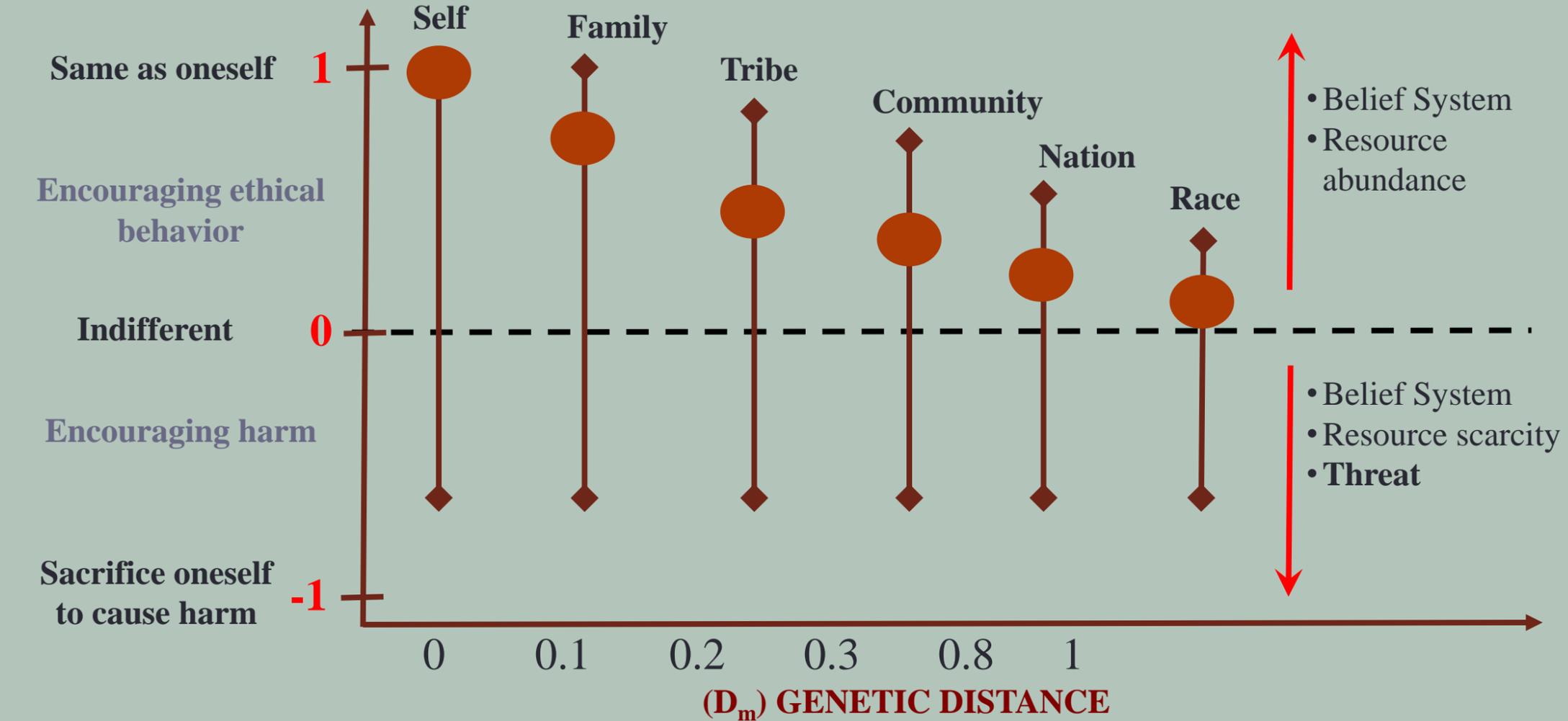
Genetic tree of 26 European populations

FST distances are based on an average of 88 genes



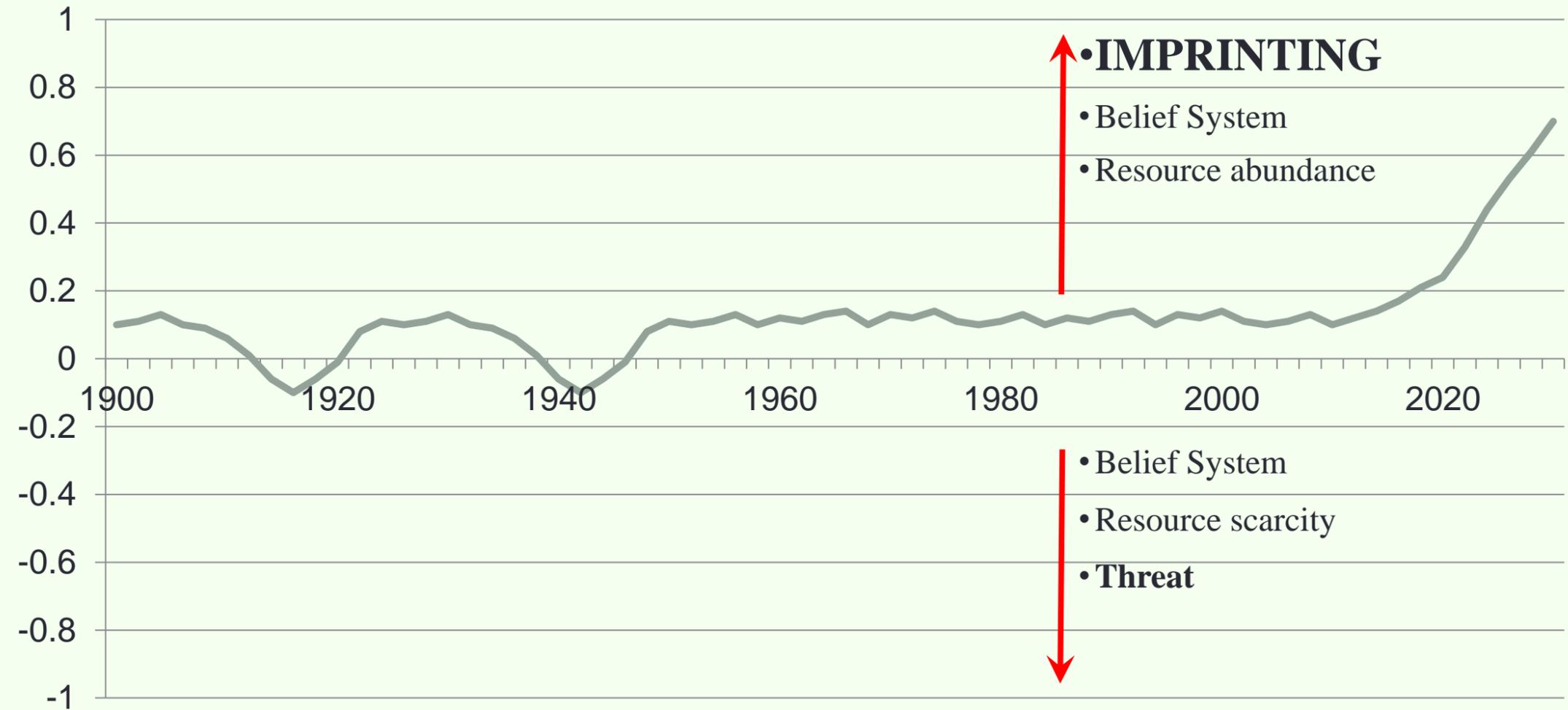
D_m – coefficient of genetic distance within one species
 0 - represents complete match (identical twins)
 1 - represents complete mismatch (unrelated race)

ALTRUISM COEFFICIENT



World Altruism coefficient graph

We need to shift the curve up



VIII

New dangers and possibilities

Moses Views the Promised Land



Engraving by Gerard Jollain from the 1670 "La Sainte Bible"

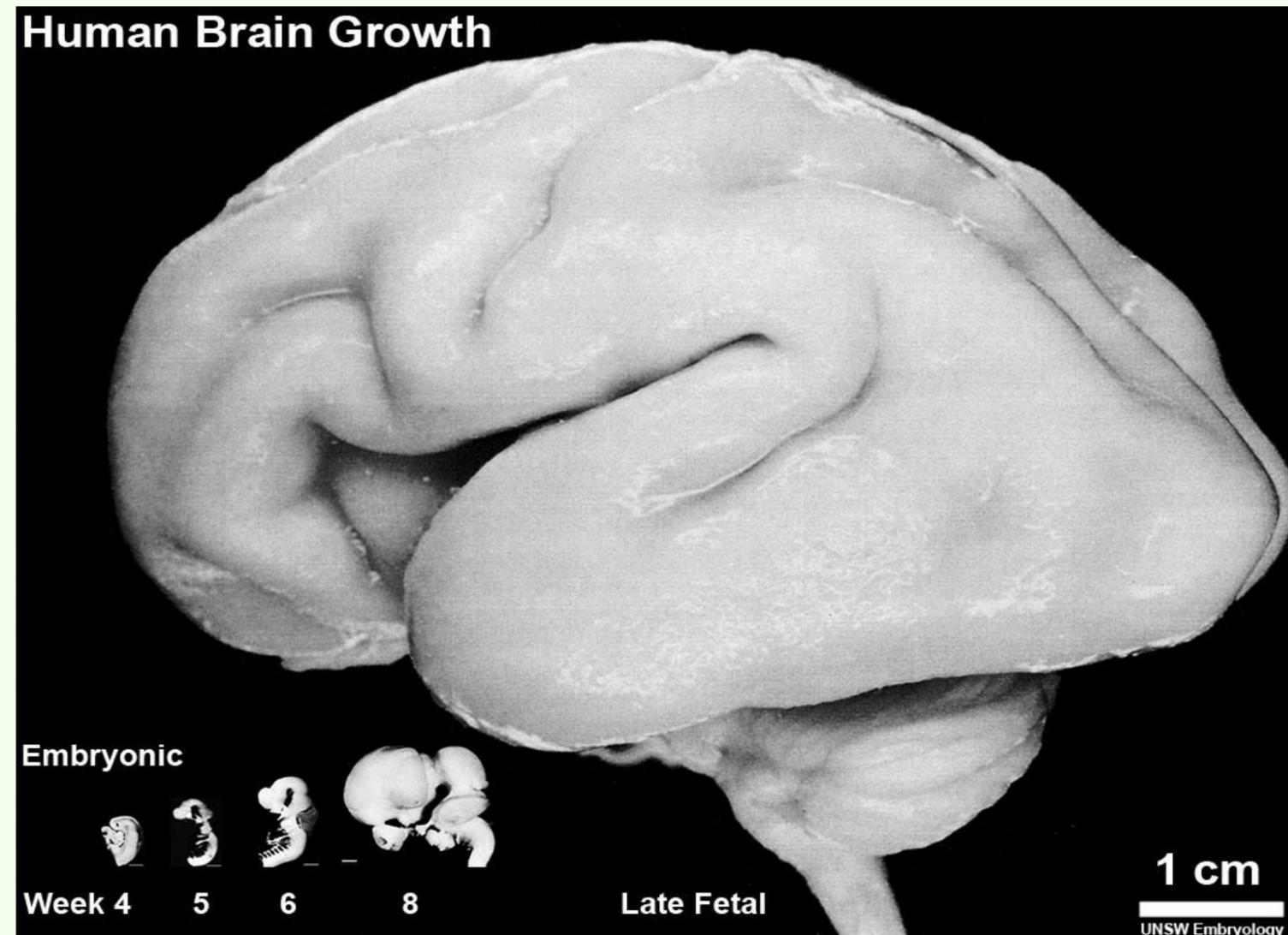
Where are we now?



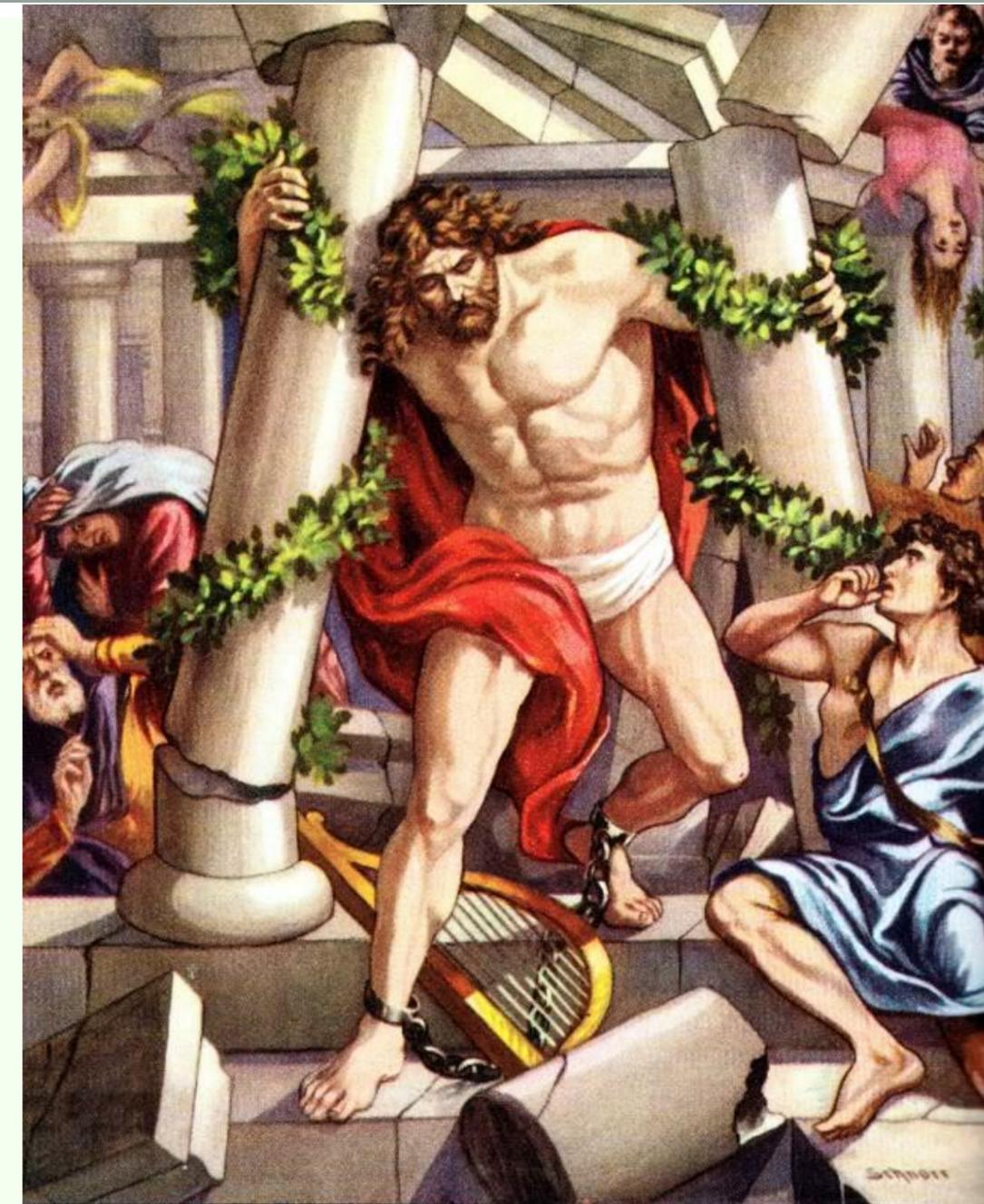
2017

The World Brain in a state of
dangerous peril

Current stage of development of the world brain



It is incomplete, chaotic and dangerous





At the same time the World Brain waxes
its powers toward the stars



What the World Brain Can Do?

- It sees what is.
- It sees what was.
- It understands the causality that cause temporal change.
- It therefore is able to predict the future.
- It can change the future by changing the present.
- It can do so in the most effective way to maximize the best possible outcomes.



KNOWN



$$V = \frac{4}{3}\pi r^3$$

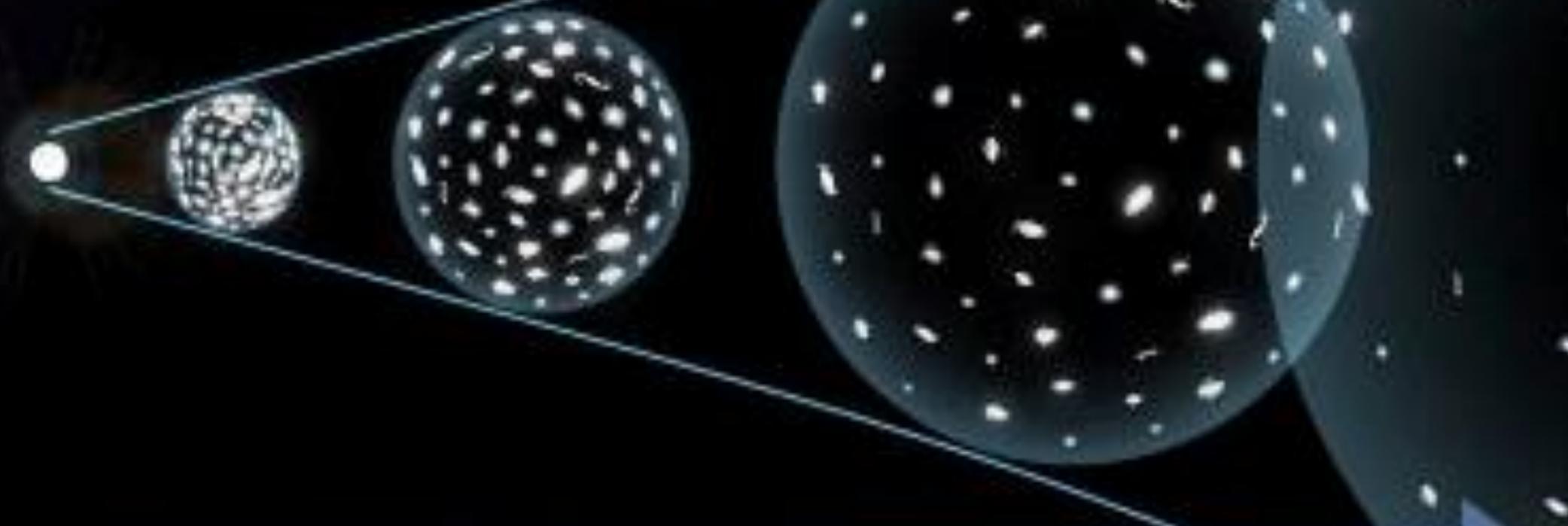
UNKNOWN



KNOWN



BIG BANG

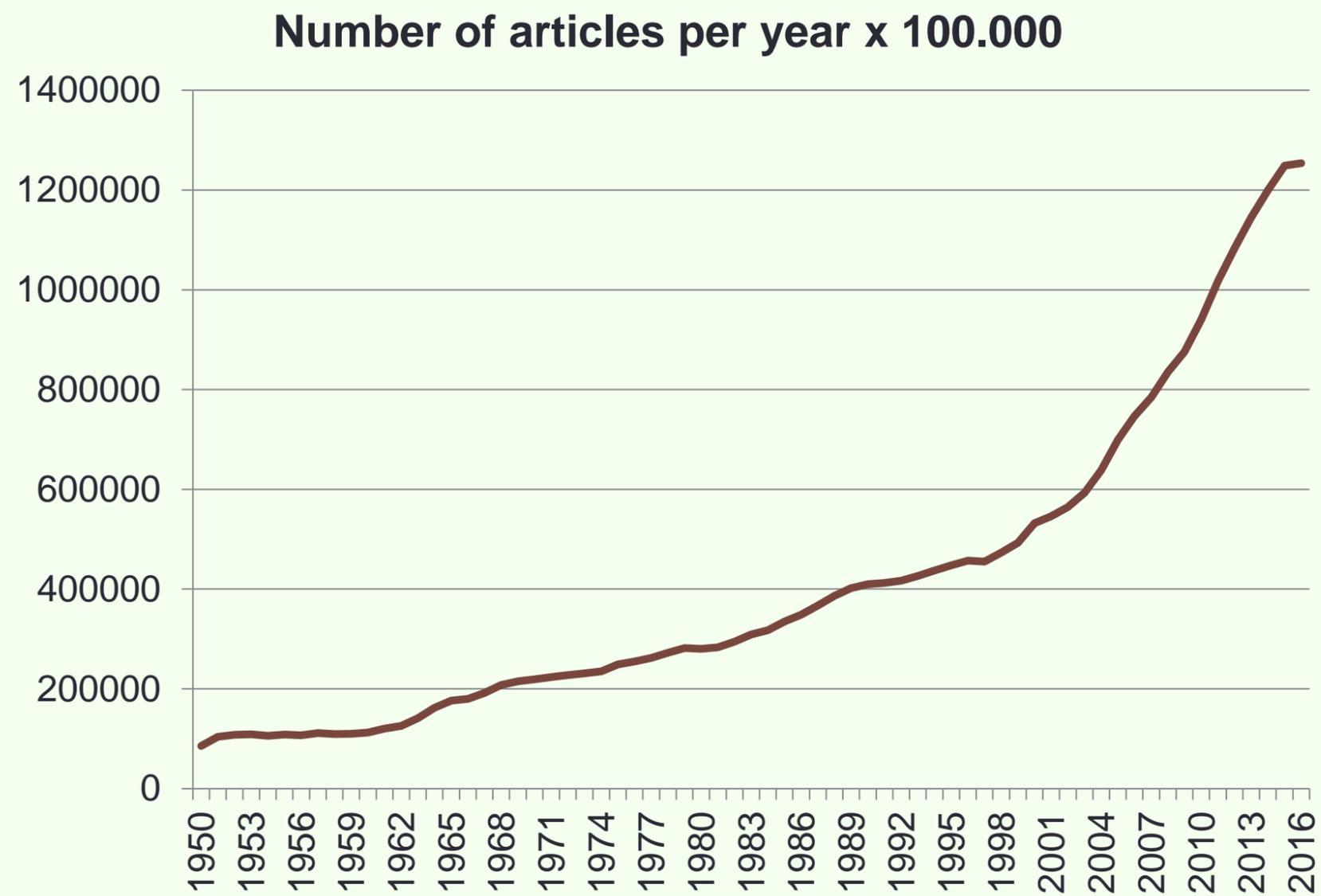


EXPANSION

And expansion of the universe

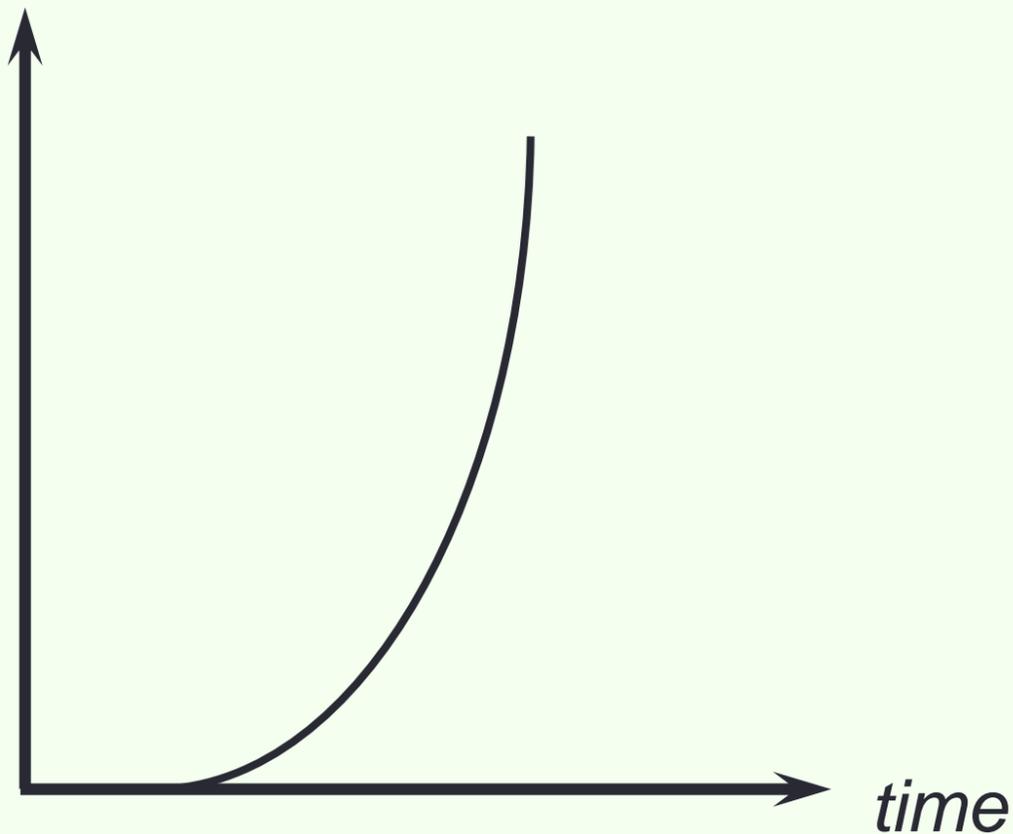


Number of all PubMed articles



Volume expansion graph of a sphere

Volume (knowledge)



$$V = \frac{4}{3}\pi R^3$$



$$R = \frac{1}{2}at^2$$

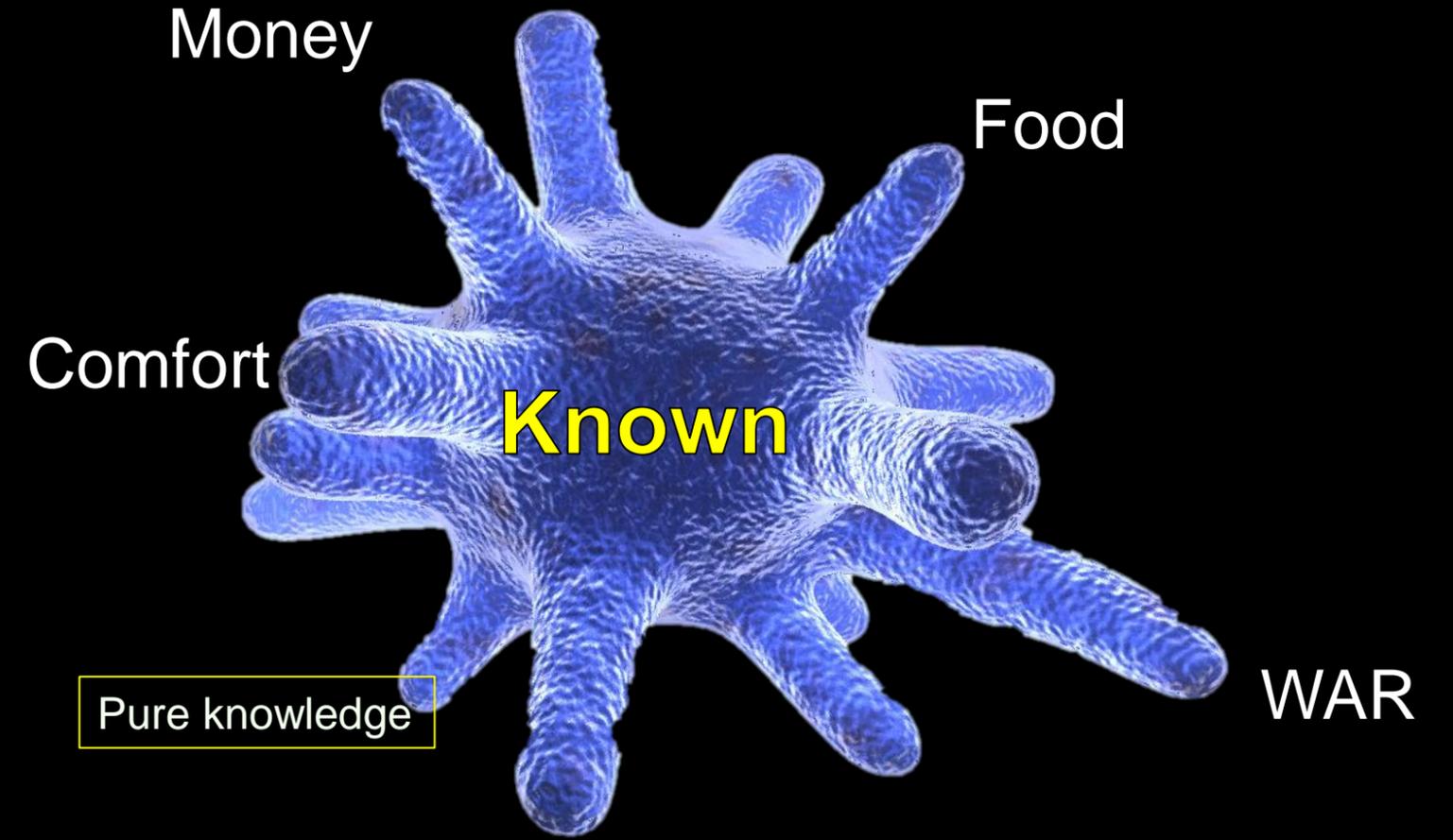


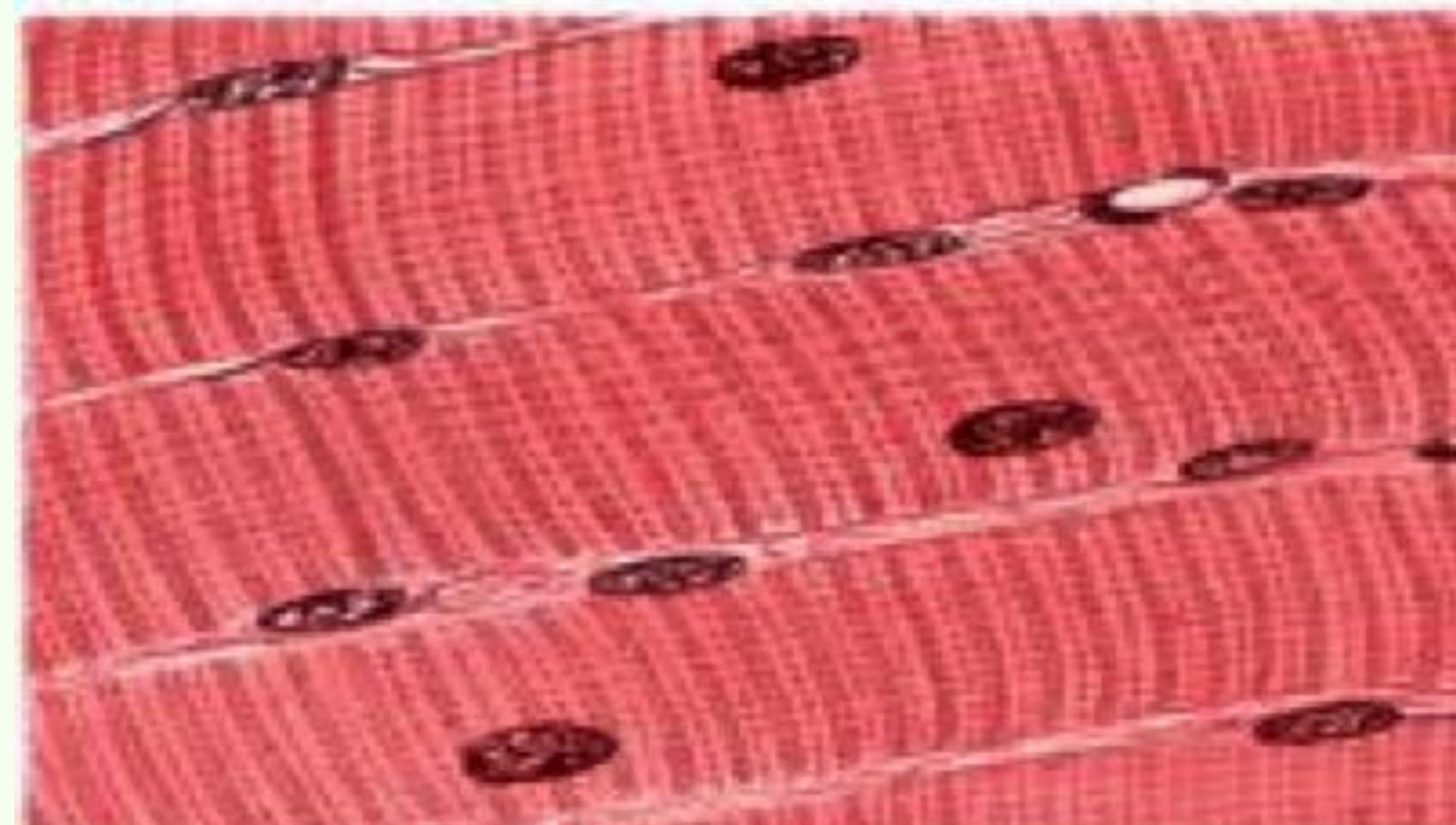
$$V \approx t^6$$

World Brain has a segregated wiring system

- Most of the World Brain knowledge develops to serve Rhinencephalon
- Only Few resources are spent for pure knowledge
- World Brain's task is to properly imprint neurons specialized in obtaining this knowledge

Unknown

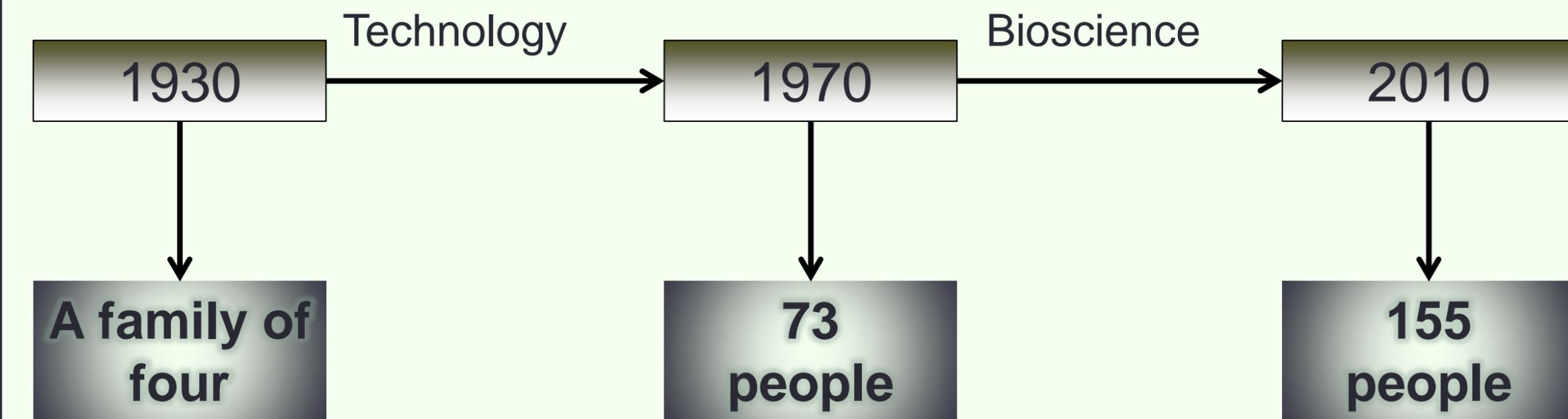




World brain makes this unnecessary



How many people does one farmer feed
in a year in the United States?



Source: USDA, Sullivan, Kirschenmann



New skills - Language and speech recognition



Doctor Who – time traveller

Wearable Translator

The world's first wearable translator—breaking the language barrier and making communication happen.

The image shows two women, one American and one Japanese, wearing the ili wearable translator. The American woman says "What's up?" and the Japanese woman responds "ねえ、元気?" (Hey, how are you?). The device is a white, vertical, rectangular unit with a circular button and a small display.

Simple and Easy.
Push and Talk!





The Raising of Lazarus

Rembrandt
1631



IX

Conclusion

The tyranny of DNA in brain formation
(No free will is possible)



Emperor Ming



Free will

Is it possible to protect and preserve the
World Brain?



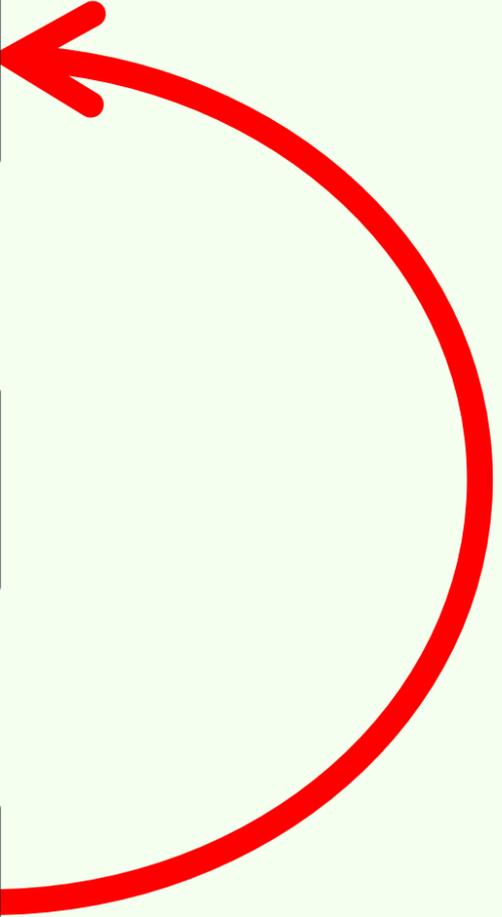
Rhinencephalon



Neopallium



World Brain



THE CURSE (Genesis 3)

16 To the woman he said,

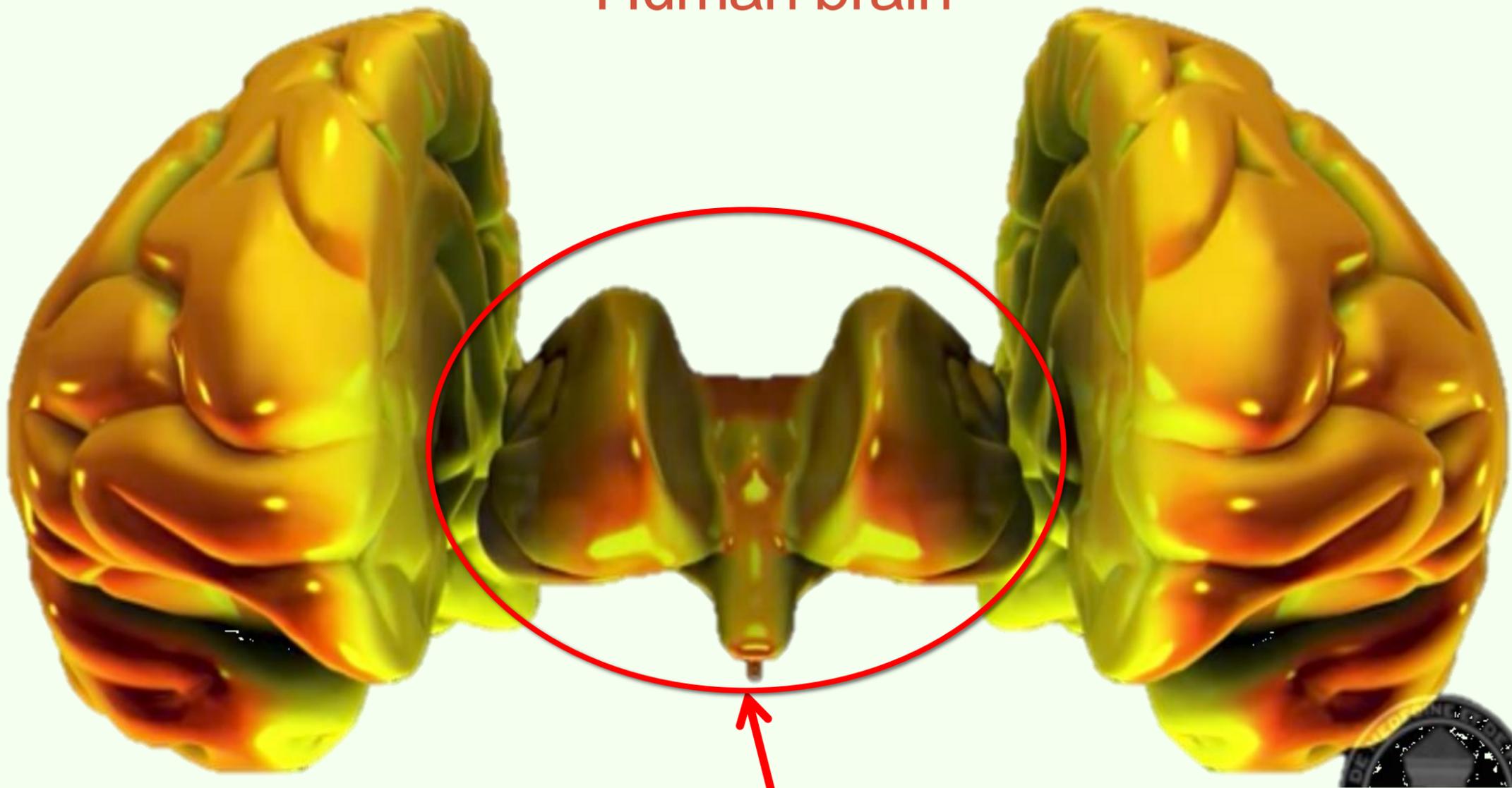
- “I will make your pains in childbearing very severe; with painful labor you will give birth to children.
- Your desire will be for your husband, and he will rule over you.”

17 To Adam he said,

- “Cursed is the ground because of you; through painful toil you will eat food from it all the days of your life. It will produce thorns and thistles for you, and you will eat the plants of the field.
- By the sweat of your brow you will eat your food until you return to the ground, since from it you were taken; for dust you are and to dust you will return.”



Human brain

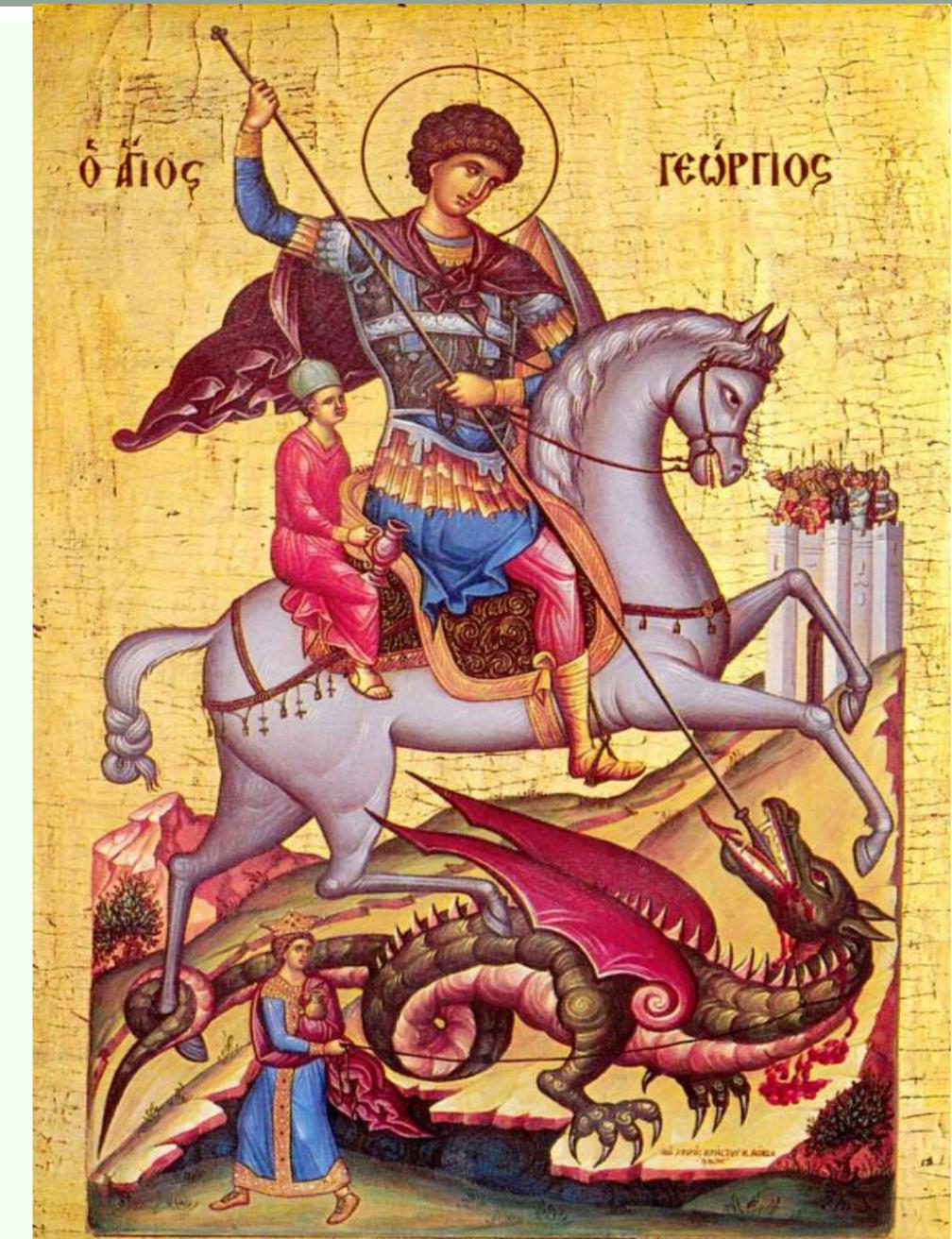


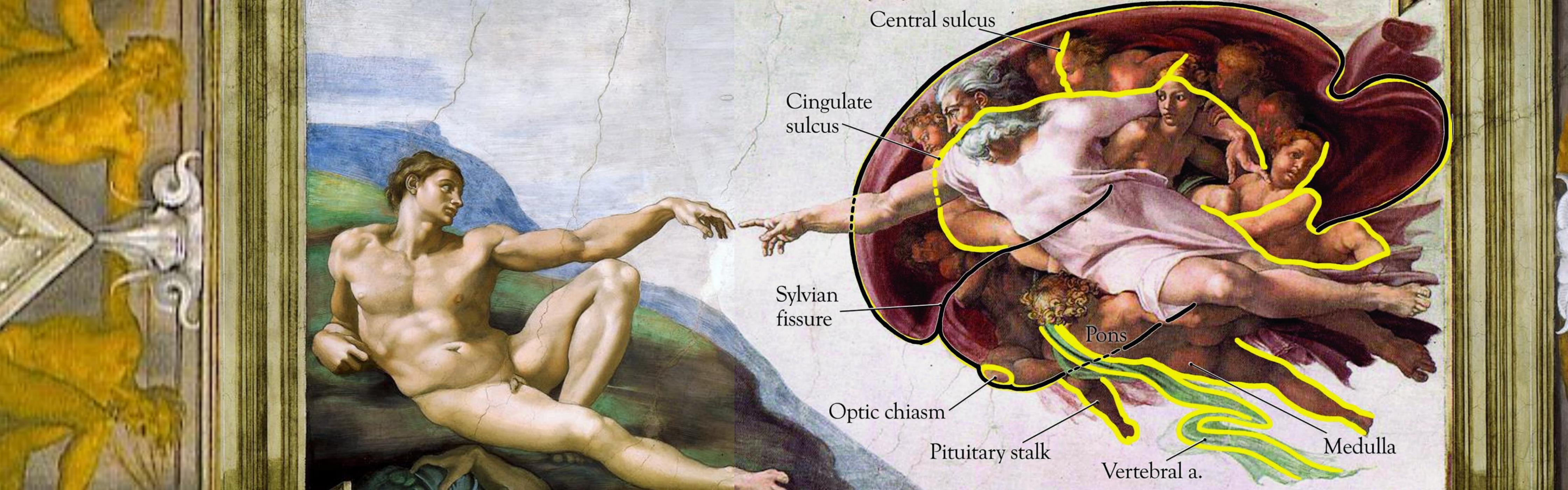
Rhinencephalon

Snake brain



St. George kills
the dragon





Central sulcus

Cingulate sulcus

Sylvian fissure

Pons

Optic chiasm

Pituitary stalk

Vertebral a.

Medulla