THE FUTURE FROM A BIG HISTORY PERSPECTIVE

David Christian

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"Panel on Planetary Thinking"
Justus Liebig University

Giessen

THANK YOU for the invitation!

- Groups such as yours make me think we could be near a tipping point at which trans-disciplinary thinking returns
- I agree with your website:
  - "*We cannot think, search or find answers to great contemporary questions and challenges within traditional academic disciplines*."

THE PROBLEM OF OVER-SPECIALIZATION: ERWIN SCHRÖDINGER

- Erwin Schrödinger, 1944, from *What is Life?*
- *"We have inherited from our forefathers the keen longing for unified all-embracing knowledge. The very name given to the highest institutions of learning reminds us, that from antiquity and throughout many centuries the universal aspect has been the only one to be given full credit."*
- "The View from the Mountain Top"

THE DILEMMA OF HYPER-SPECIALIZATION

- Erwin Schrödinger [1944, from *What is Life?*]
- And yet, we now have so much knowledge that: "*it has become next to impossible for a single mind fully to command more than a small specialized portion of it.*"

STUDYING THE PIXELS

MISSING THE MESSAGE

REGAINING A BALANCE BETWEEN SPECIALIST & UNIVERSAL KNOWLEDGE

- Erwin Schdödinger [1944, from *What is Life?*]
- What do to? "*I can see no other escape from this dilemma (lest our true aim be lost forever) than that some of us should venture to embark on a synthesis of facts and theories, albeit with second-hand and incomplete knowledge of some of them—and at the risk of making fools of ourselves.*"

BIG HISTORY

- I’ve been teaching Big History for almost 30 years
- Trying to meet Schrödinger’s challenge of combining knowledge in depth with knowledge in breadth
- Histories of the Universe, linking disciplines from cosmology to biology and history
- The Story? A drama between complexity and entropy:
  - I told it as a story of the emergence of complex things in a universe dominated by entropy
  - 8 Thresholds of increasing complexity:

The Big History story explores many different disciplines, focusing on 8 major “thresholds of increasing complexity”

1. Creation of the universe [Cosmology]
2. The first stars [Astronomy]
3. New chemical elements [Chemistry]
4. Planets and our Earth [Geology]
5. The emergence of life [Biology]
6. Human beings [Anthropology]
7. Agricultural societies [History]
8. Today’s globalized world [History]

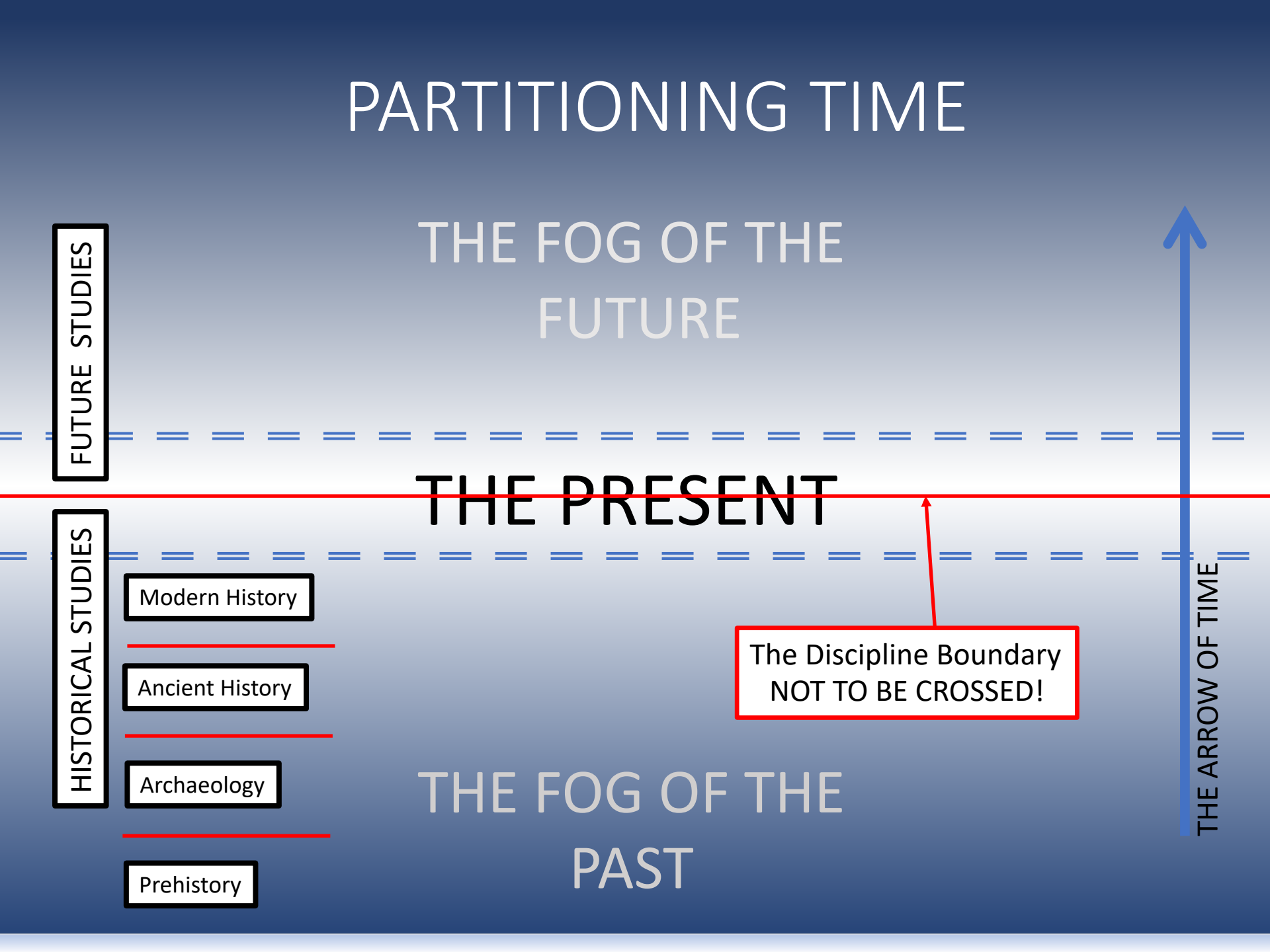
BIG HISTORY: CURRENT STATUS?

- The Good News:
  - It's now a known quantity: lots of writing, courses, an association, a journal
- The Bad News:
  - Big History remains marginal: most teaching and scholarship dominated by the idea that good knowledge is specialized knowledge: knowledge that is too wide is not rigorous
  - My own University has now abandoned big history

THIS TALK: ONE EXAMPLE OF HOW HYPER-DISCIPLINARITY BLINDS US

- The border between past-thinking and future-thinking: I'm working on a book on the future
  - **Future thinking**: in many specialist disciplines, institutes, government organizations and Future Studies
  - **Past thinking**: in all schools and Universities
- Little contact between them, which blocks profoundly important insights

PARTITIONING TIME



Most historians accept R.G. Collingwood's argument for separating past thinking and future thinking

"*The historian's business is to know the past not to know the future; and whenever historians claim to be able to determine the future in advance of its happening, we may know with certainty that something has gone wrong with their fundamental conception of history*."

- R.G. Collingwood, *The Idea of History*, Rev. Ed., (Oxford, OUP, 1993), p. 54

Most historians agree, but some argue this is back to front: future thinking is the *reason* for studying the past

- A philosopher, Immanuel Kant:
  - "*Recalling the past (remembering) occurs only with the intention of making it possible to foresee the future; we look about us from the standpoint of the present in order to … be prepared for something*."
- A biologist, Joseph LeDoux:
  - "*memory* [i.e. knowledge of the past] *is first and foremost a cellular function that facilitates survival by enabling the past to inform present or future cellular function, ….*"
- I agree: study of the past and study of the future belong together

SOME BASIC PRINCIPLES FOR RIGOROUS FUTURE THINKING

Rarely studied outside specialized disciplines, so few study the fundamental principles:

1. In future thinking you don't work with detailed facts:
   - I don't know the date of my death
2. In future thinking you work with probabilistic trends, but some are regular enough to allow confident prediction:
   - I will die!
   - My confidence is based on a leap of faith (inductive logic) that past trends will continue
   - And the fact that the Universe has laws and regularities
3. All clues to the future lie in the past:
   - I say I will die because every organism in the past has died.
   - This makes it bizarre that historians and future thinkers do not work together

Dante's Inferno, XX, on Soothsayers and Fortune Tellers

"They tried to look too far ahead in the future, and now they are punished by not being able to look ahead at all. Now they travel by walking backward because they can see only backward, not forward."

I

Image from https://indrasmusings.wordpress.com/2016/03/04/inferno-xx-tiresias-twisted-neck/ [This shows Tiresias and others, but actually, this is a good image of the real situation of all people!]

Priamo della Quercia – Dante's Divine Comedy, Yates Thompson 36 f. 021v – British Library, London – c1444-50

SEARCHING FOR TRENDS IN THE PAST THAT OFFER CLUES TO THE FUTURE

- **TREND-HUNTING**
  - The heart of good future thinking
- Trends vary on two dimensions:
  - Regularity → FUTURE CONE OF PREDICTABILITY
  - Shape → DIFFERENT TYPES OF TRENDS

THE REGULARITY OF TRENDS

Four domains of predictability

3) POSSIBLE: 1-25% confidence? Lots of known unknowns; don't bet your life savings

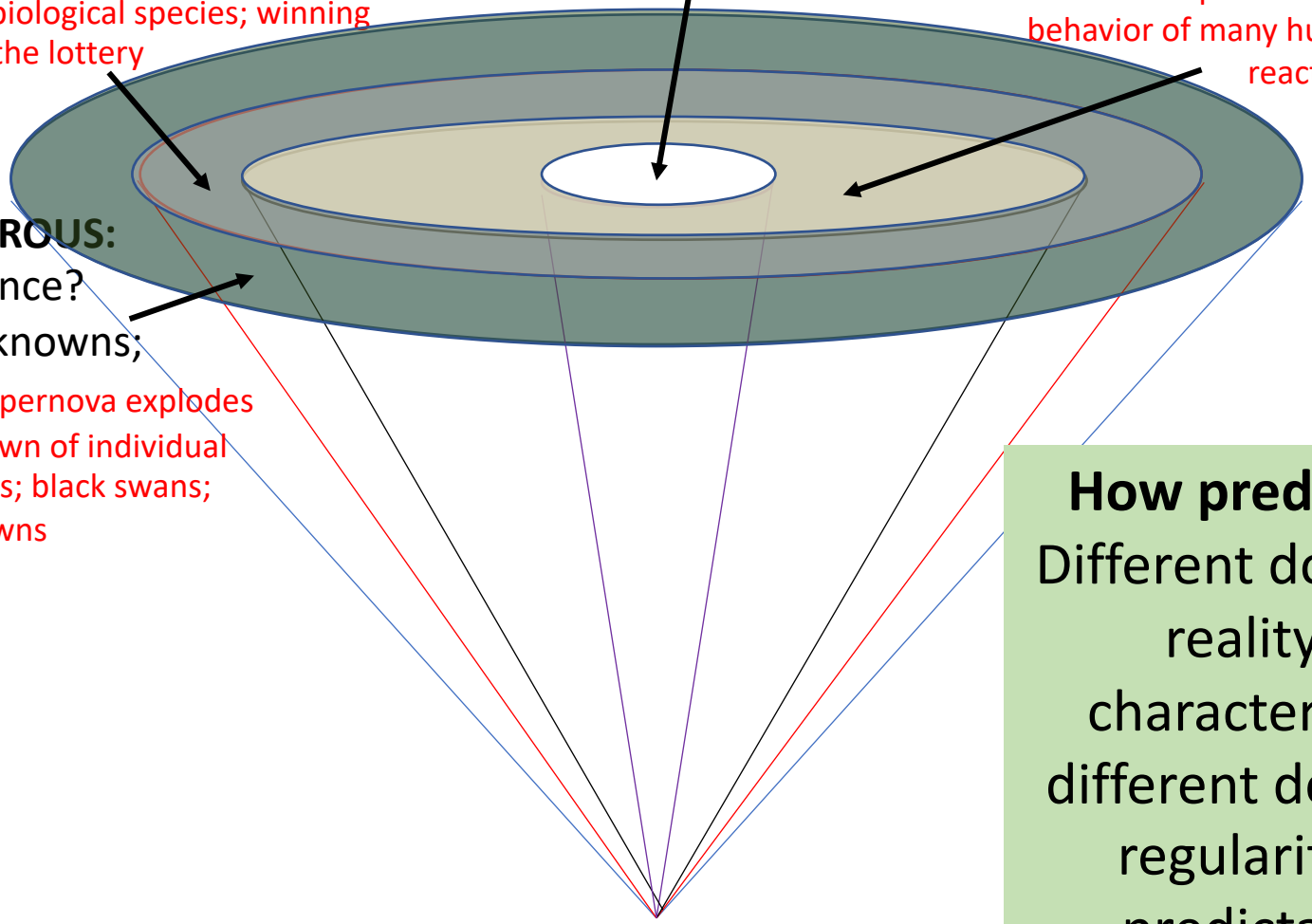
Irregular processes; actions of individual purposeful organisms; evolution of technologies & biological species; winning the lottery

1) PROBABLE: 75-99% Confidence? Worth a bet

Mechanical processes; astronomical orbits; evolution of the Universe; death & taxes

2) PLAUSIBLE: 25-75% confidence? Some known unknowns; bet cautiously

Probabilistic processes; demographic behavior of many humans; chemical reactions; long term climate change; impact of well-known drugs;



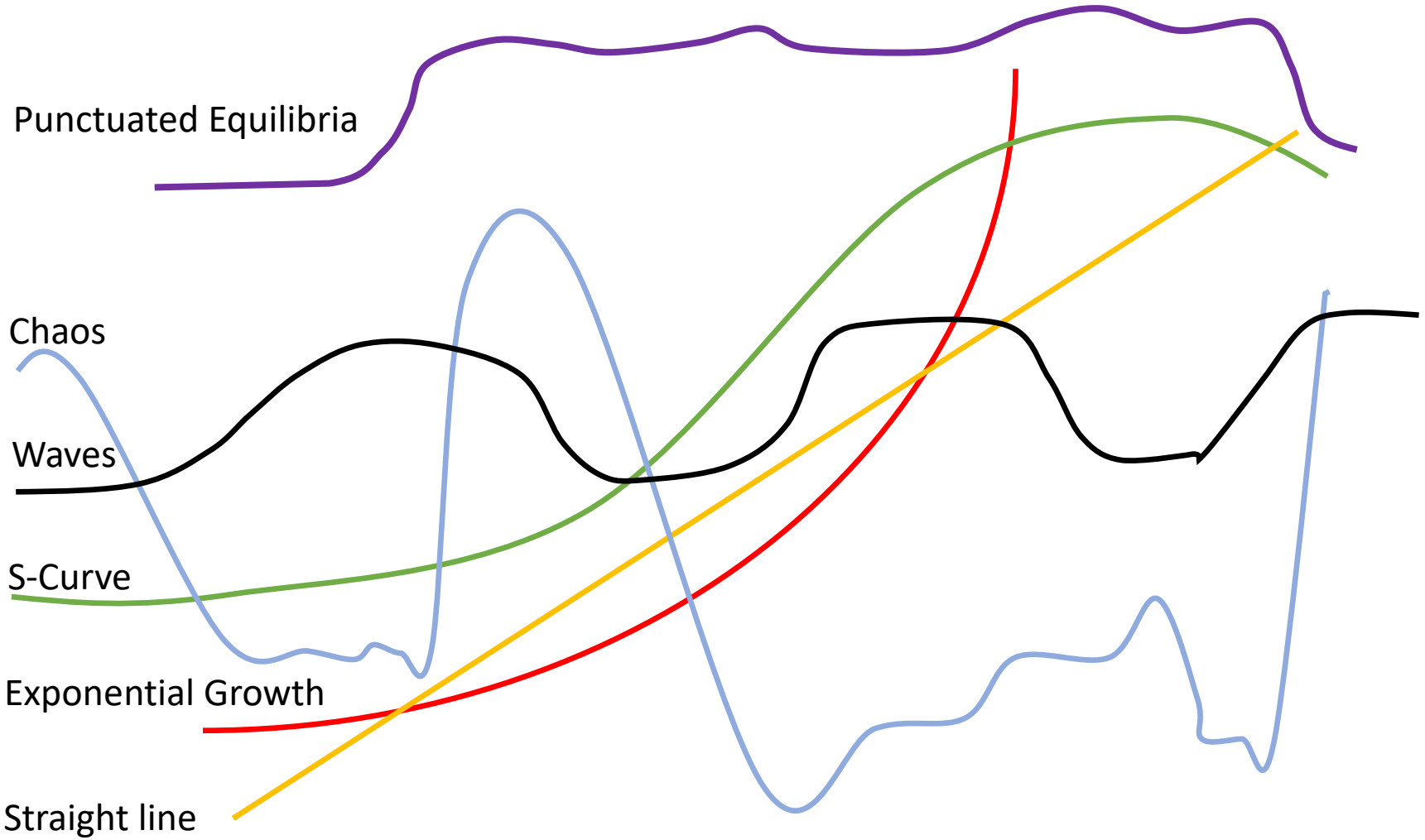
4) PREPOSTEROUS: 0-1% confidence? unknown unknowns; don't bet A supernova explodes near us; breakdown of individual radioactive atoms; black swans; unknown unknowns

TIME

NOW

How predictable? Different domains of reality are characterized by different degrees of regularity and predictability.

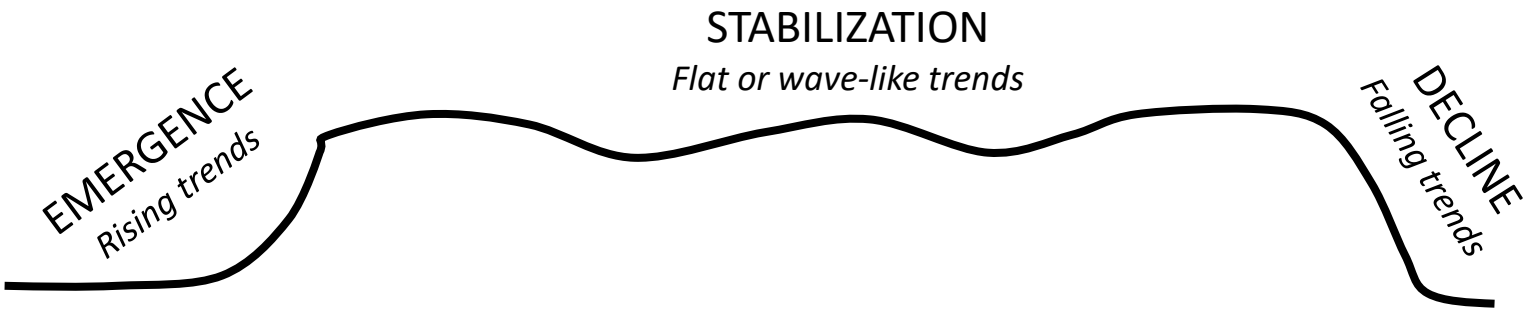
THE SHAPE OF TRENDS



A Universal Trend: Punctuated Equilibria

Fundamental to Big History

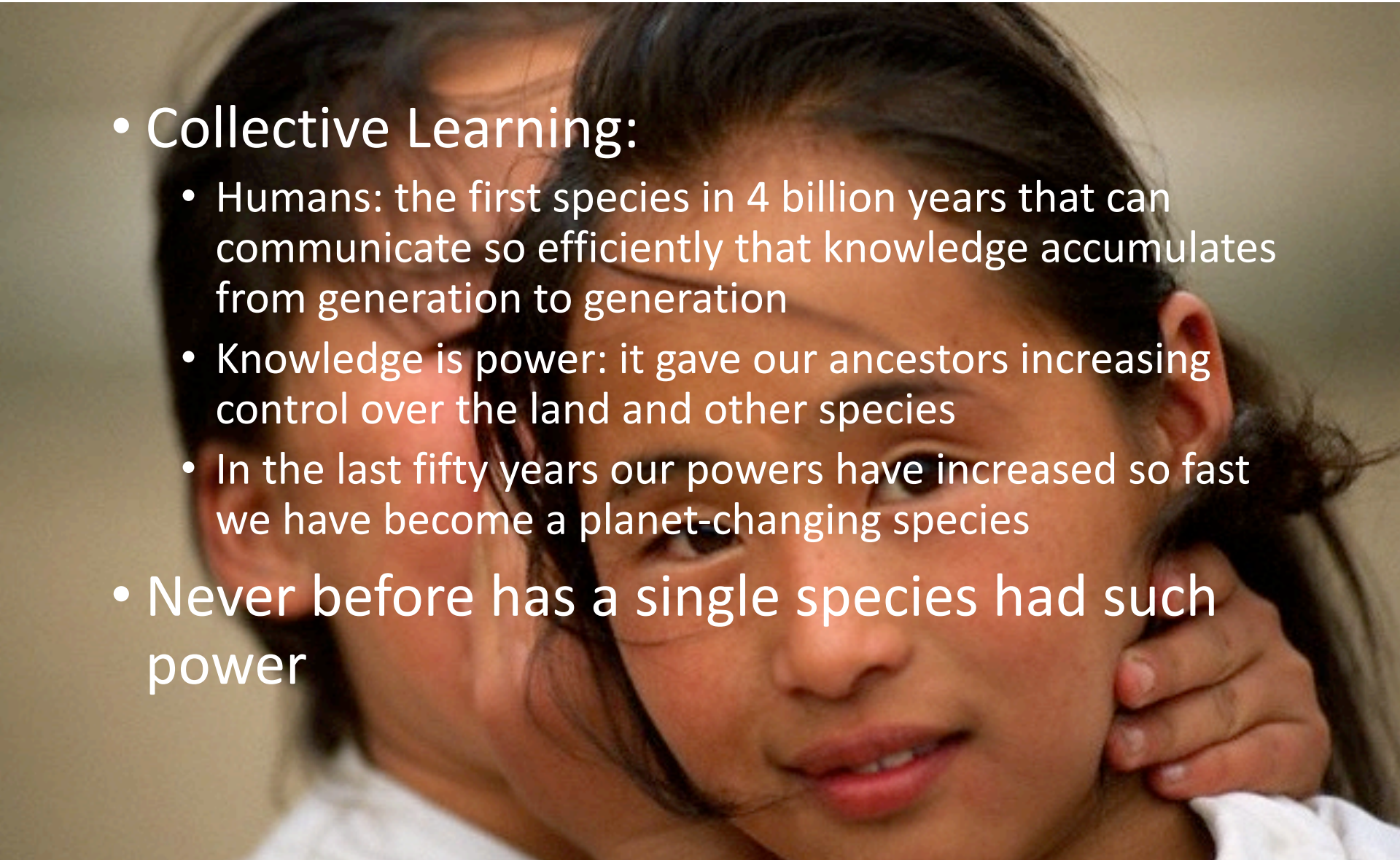
- The shape of the histories of all complex structures
- Stars, atoms, planets, living species, living organisms, human societies
- Defined by the universal tension between emerging complexity and entropy



SEARCHING THE PAST FOR TRENDS WITH CLUES TO THE FUTURE

- What trends in human history offer clues about the future of humanity?
- Large, regular trends, the kind most historians ignore because they focus overwhelmingly on the highly unpredictable activities of individuals
- Large, regular trends do exist if you study the past with a wide enough lens, like that of Big History!

COLLECTIVE LEARNING: THE DEFINING TREND OF HUMAN HISTORY



- Collective Learning:
  - Humans: the first species in 4 billion years that can communicate so efficiently that knowledge accumulates from generation to generation
  - Knowledge is power: it gave our ancestors increasing control over the land and other species
  - In the last fifty years our powers have increased so fast we have become a planet-changing species
- Never before has a single species had such power

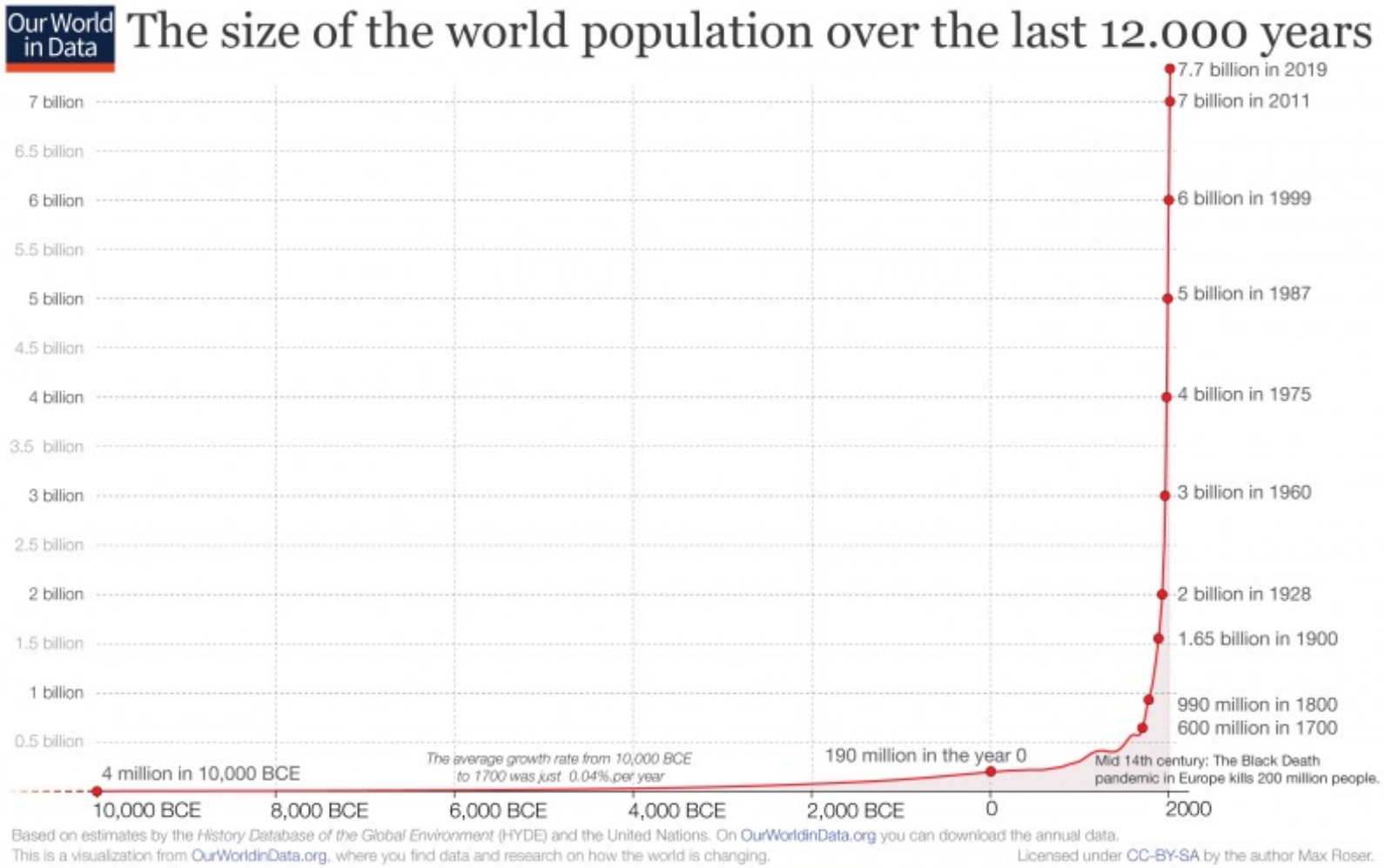
Collective Learning yields many subordinate rising trends

1. Increasing power of human technologies → today we dominate planet earth
2. Increasing scale of human networks → today we are linked across the entire globe
3. Accelerating change → today we need to react fast to manage change

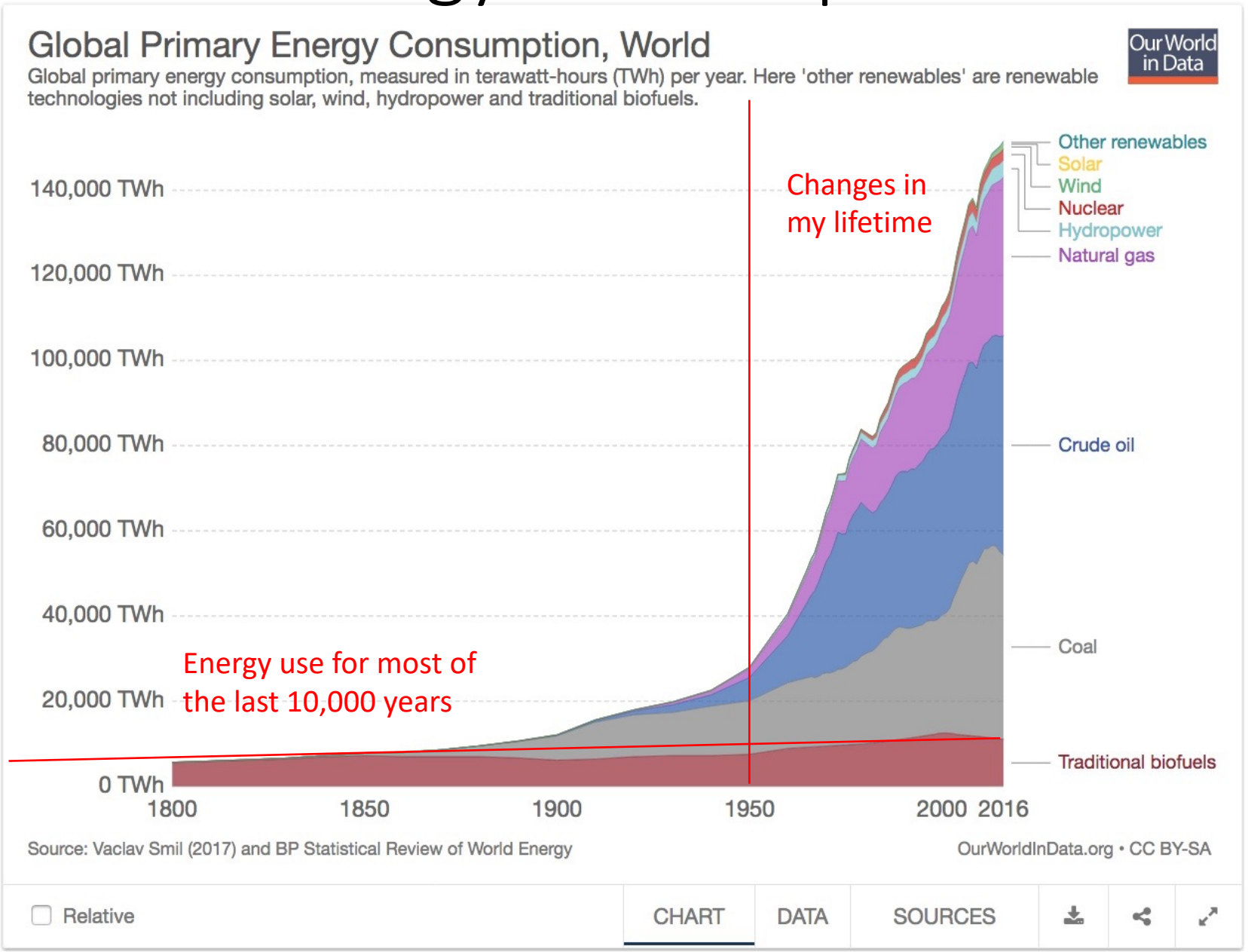
- Examples of rising trends
  - Population
  - Energy use

World Populations over the last 12,000 Years

Max Roser: World in Data figures:
https://ourworldindata.org/future-population-growth



Global Energy Consumption



From the mid 20th century, an interesting change: trends that are not rising & limits to growth trends

- Some trends are slowing spontaneously:
  - economic growth?
  - population growth
- Some must be slowed to avoid serious danger:
  - Emission of pollutants (above all greenhouse gases)
  - Increasing power of human weaponry

Signs of slowing economic growth

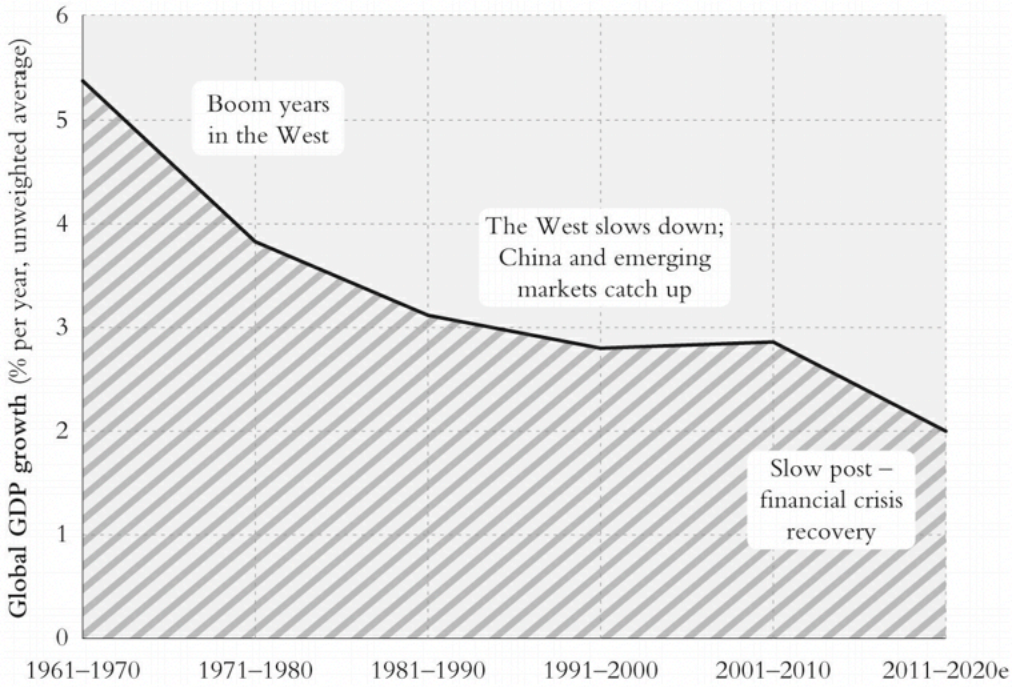


Figure 2.1 World GDP Growth Has Been Trending Downward since the 1960s

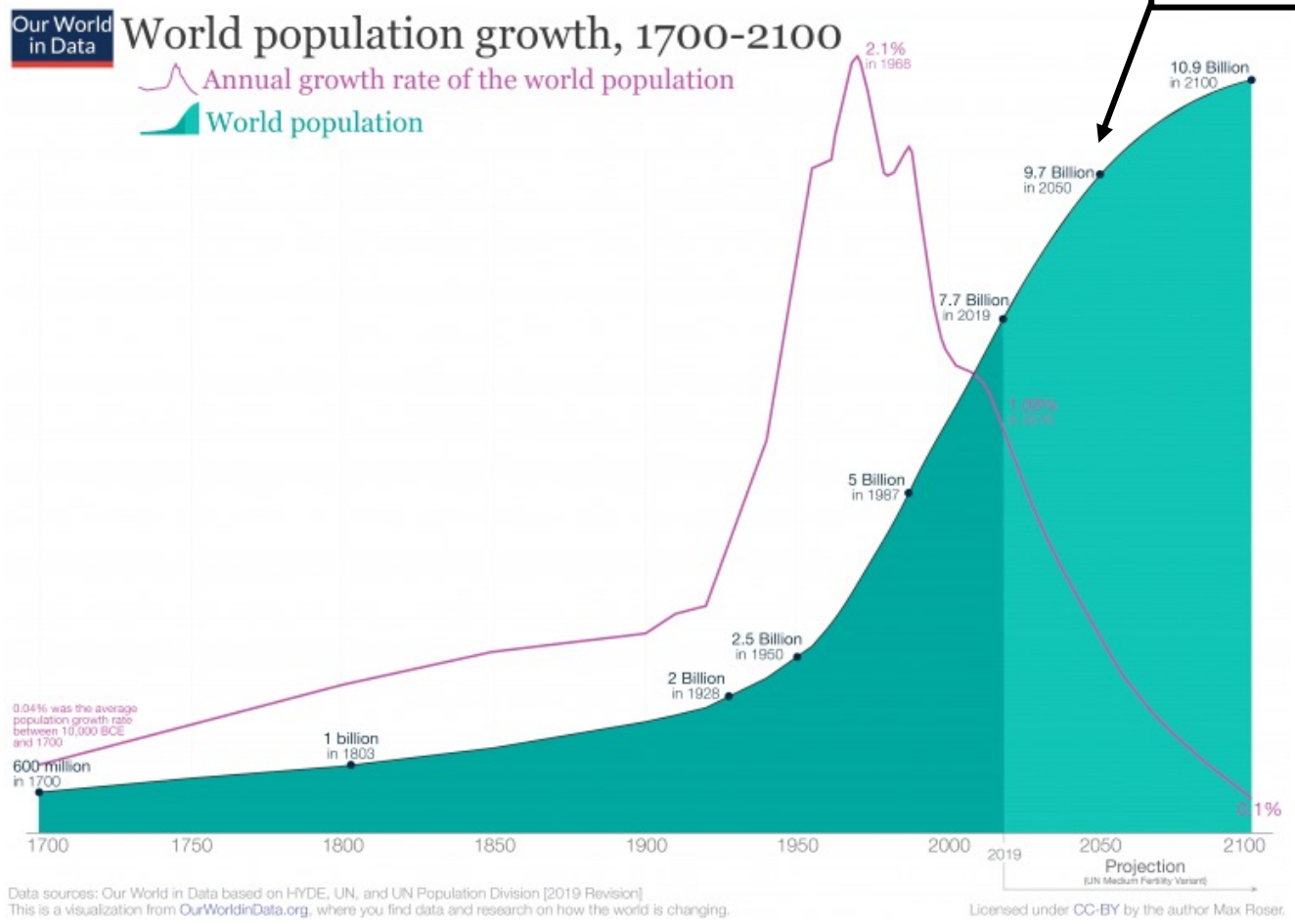
Source: Redrawn from World Bank GDP growth (annual %), 1960–2019.

From Schwab, *Stakeholder Capitalism,* p. 25

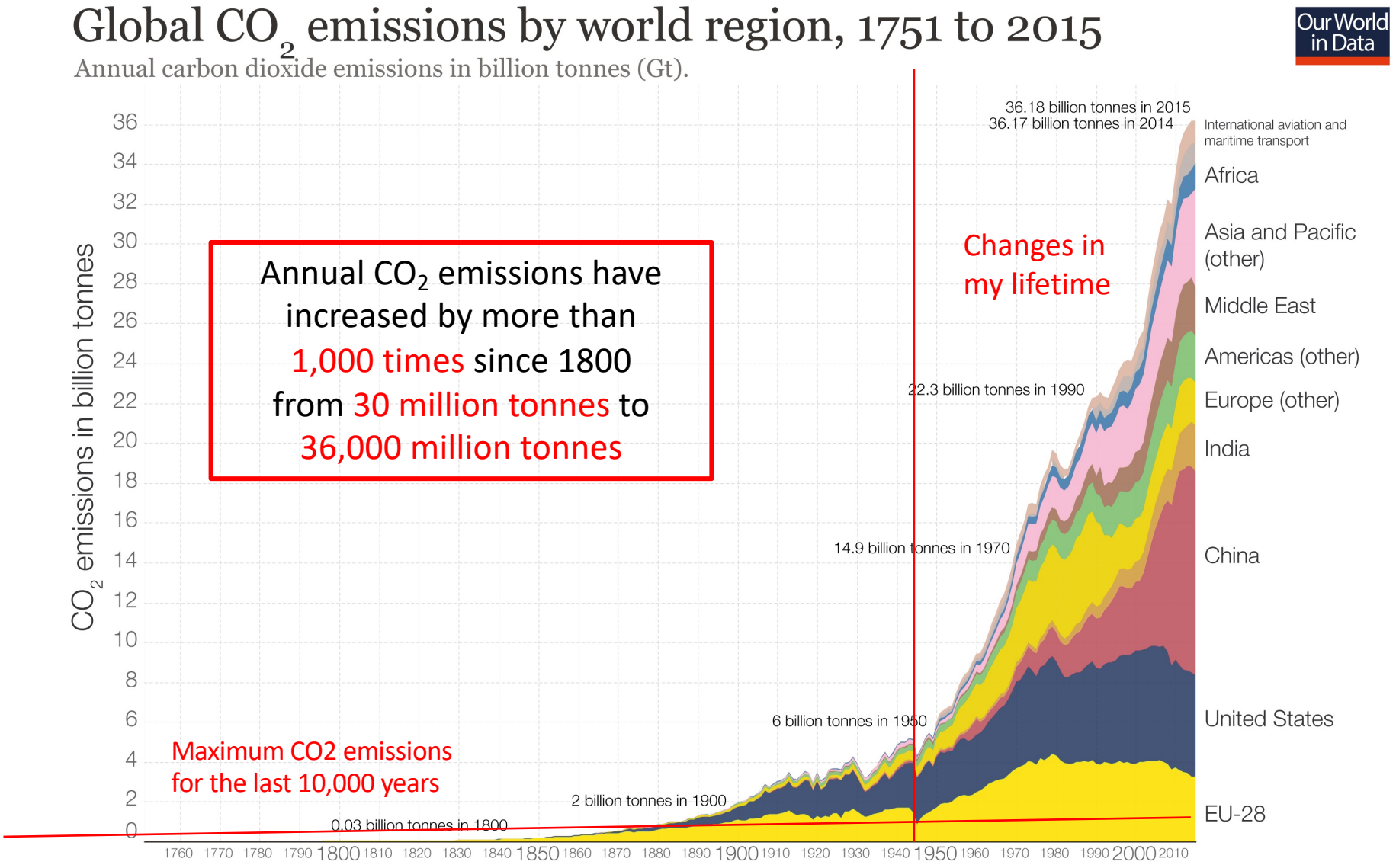
Slowing Population Growth

Max Roser: World in Data figures:
https://ourworldindata.org/future-population-growth

An exponential curve turning into an S-curve



Growth Trends we must check



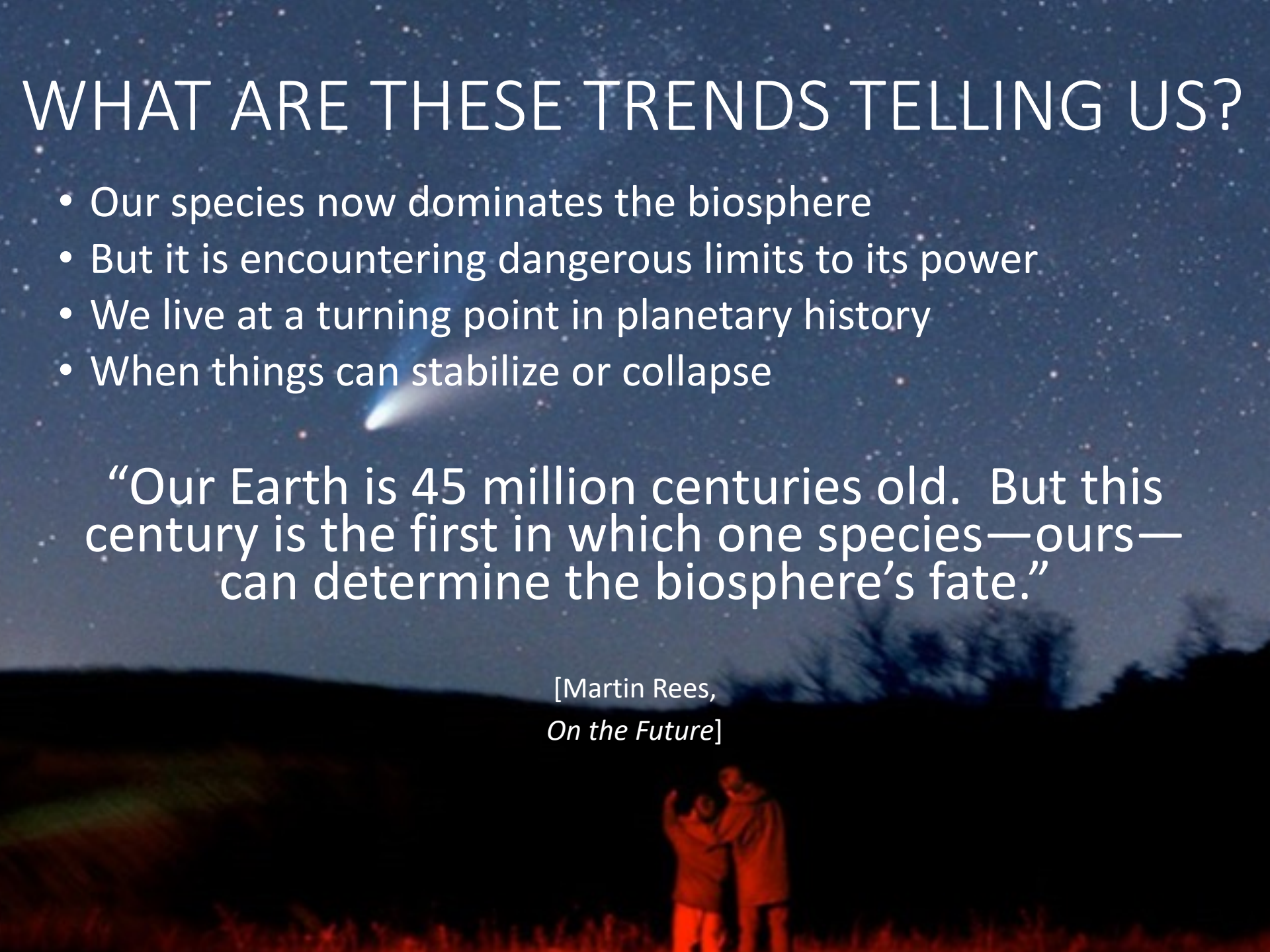
Data source: Carbon Dioxide Information Analysis Center (CDIAC); aggregation by world region by Our World In Data.
The interactive data visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic.

WHAT ARE THESE TRENDS TELLING US?

- Our species now dominates the biosphere
- But it is encountering dangerous limits to its power
- We live at a turning point in planetary history
- When things can stabilize or collapse

"Our Earth is 45 million centuries old. But this century is the first in which one species—ours—can determine the biosphere's fate."

[Martin Rees,
On the Future]

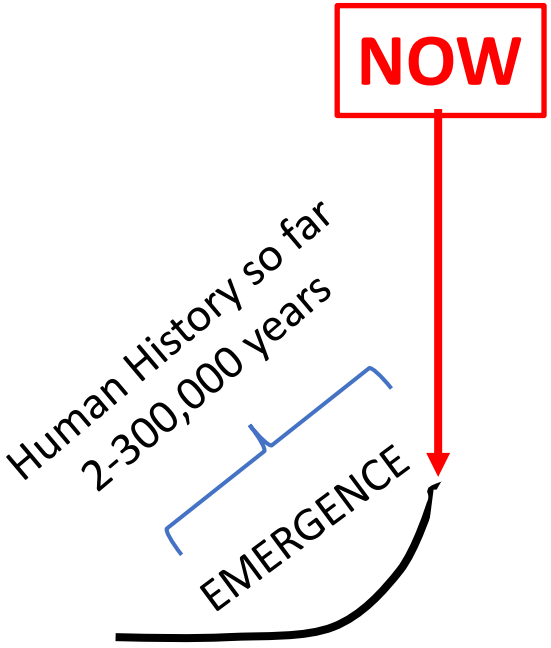


A FORK IN THE ROAD OF PLANETARY HISTORY: TWO POSSIBLE FUTURE PATHS

- COLLAPSE: We fail to collaborate in the task of managing a planet and human societies collapse
- STABILIZATION: We learn to collaborate in the task of managing a planet sustainably

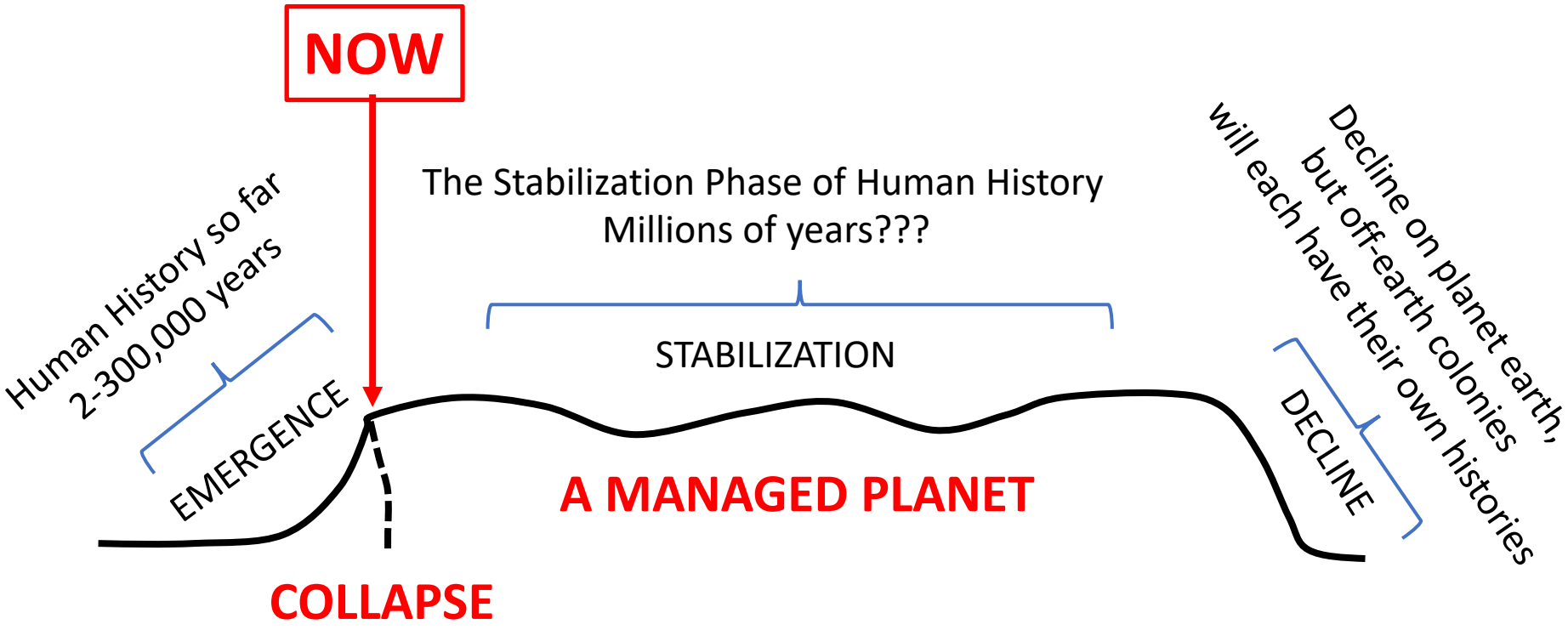
These ideas suggest our place in a total history of humanity:

knowing where you are in a story is a powerful form of meaning



History so far. But many of the the rising trends that have shaped history so far seem to be reaching limits

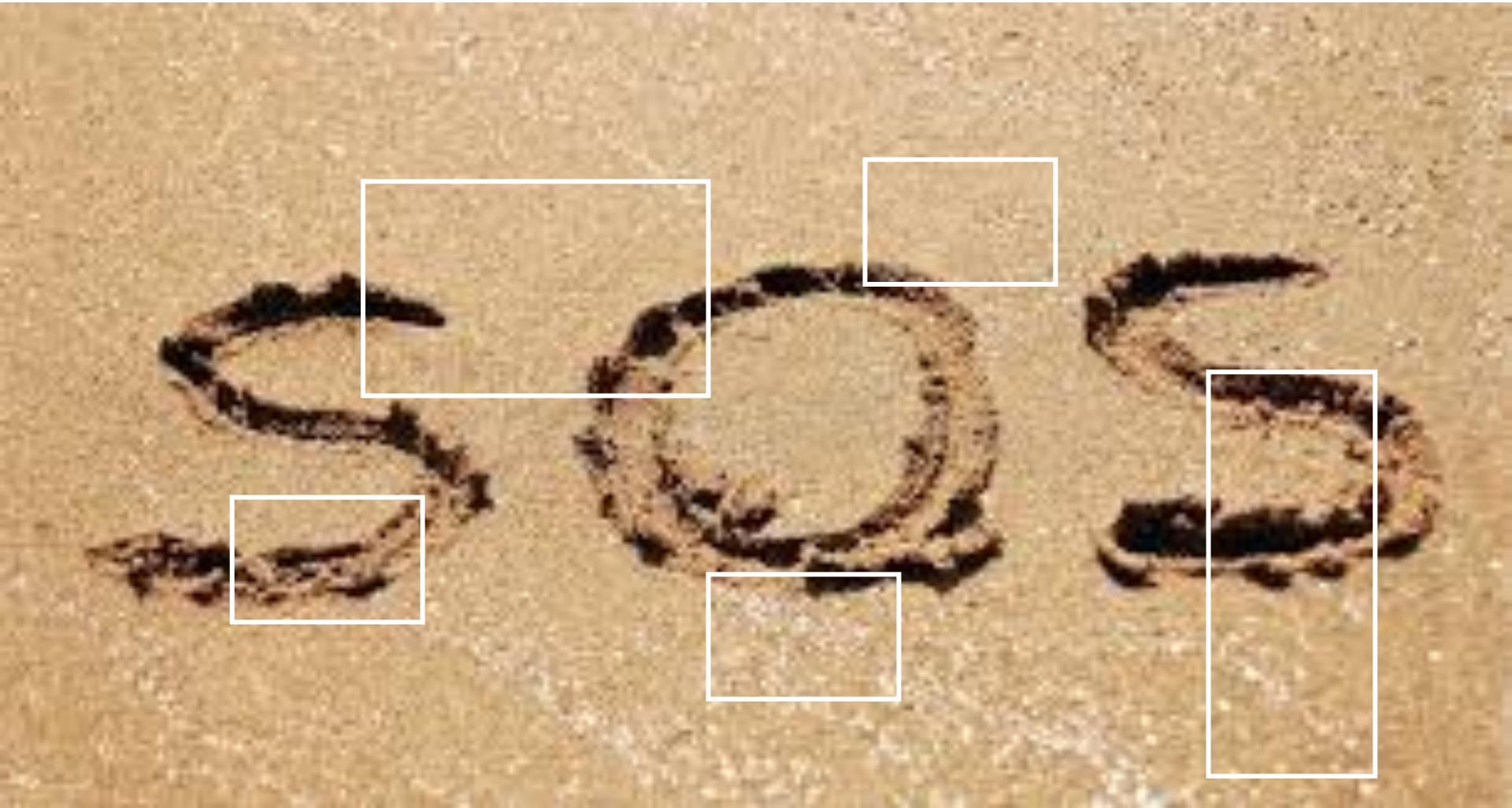
These ideas suggest where we may be in the story of human history:



COULD THE STAKES BE HIGHER?

- PERSONAL: The Future of my Grandchildren
- HUMAN: The Future of Humanity which could extend over millions of years
- PLANETARY: The future of the biosphere
- COSMOLOGICAL: The future of a new complex entity: a managed planet in our neighbourhood of the Universe

YET DISCIPLINE BOUNDARIES MAKE IT HARD TO SEE THESE URGENT MESSAGES



SUMMARY: REMOVING THE BLINKERS

- **Speculative Ideas:** Many of these ideas are speculative, like many historical arguments, but rigorous speculation shapes most political action
- **Hyper-disciplinarity blocks profound insights:** We need a wider vision in order to avoid catastrophe
- **We need to teach that broad vision to the young who will be learning how to manage a planet:**
- Historians and future thinkers need to collaborate
- And we need to pursue Schrödinger's vision of "*unified, all-embracing knowledge*"


I THANK YOU FOR
YOUR ATTENTION