

# Questioning Modernity in the Anthropocene

Alexandre Le Tiec

Laboratoire Univers et Théories, Observatoire de Paris / CNRS  
Labos 1point5 / Ecopolien / Scientifiques en rébellion  
Planetary Limits Academic Network (PLAN)

December 4, 2023

[letiec.yolasite.com/anthropocène](https://letiec.yolasite.com/anthropocène)

# Outlook

- ① Some Context
- ② Welcome to Modernity
- ③ The Myth of Progress [Idealism]
- ④ The Sources of Social Power [Materialism]

# Outlook

- 1 Some Context
- 2 Welcome to Modernity
- 3 The Myth of Progress [Idealism]
- 4 The Sources of Social Power [Materialism]

# More than half of data deficient species predicted to be threatened by extinction

Jan Bergetti<sup>1</sup>, Martin Dobson<sup>1</sup>, Marthe Alexis Helberg<sup>1</sup> & Francesca Venesio<sup>2</sup>

## PNAS

PERSPECTIVE

OPEN ACCESS



### Climate Endgame: Exploring catastrophic climate change scenarios

Luke Kemp<sup>1,2,3</sup>, Chi Xu<sup>4</sup>, Jaanna Depledge<sup>5</sup>, Kristie L. Bell<sup>6</sup>, Gordon Gibbins<sup>7</sup>, Timothy A. Kohler<sup>8</sup>, Johan Rockström<sup>9</sup>, Marten Scheffer<sup>10</sup>, Hans Joachim Schellnhuber<sup>11</sup>, Will Steffen<sup>12</sup>, and Timothy M. Lenton<sup>13</sup>

### Accelerated modern human-induced species losses: Entering the sixth mass extinction

Gerardo Caballero<sup>1</sup>, Paul R. Shih<sup>2</sup>, Anthony D. Barnovsky<sup>3</sup>, Andrés García<sup>4</sup>, Robert M. Pringle<sup>5</sup>, Todd M. Palmer<sup>6</sup>

## RESEARCH ARTICLE

CLIMATE CHANGE

### Exceeding 1.5°C global warming could trigger multiple climate tipping points

David I. Braaten<sup>1</sup>, Alex Staal<sup>2</sup>, Jan F. Shaver<sup>3</sup>, Ronda Whitlock<sup>4</sup>, Boris Samsonov<sup>5</sup>, Siva Luthar<sup>6</sup>, Aya Faruqi<sup>7</sup>, Sarah E. Goran<sup>8</sup>, John Rockwell<sup>9</sup>, Timothy M. Lenton<sup>10</sup>

## VIEW

### Scientists' warning on climate change and insects

Jeffrey A. Harvey<sup>1,2</sup> | Kerin Tougeon<sup>3,4</sup> | Eleni Vols<sup>5</sup> | Mihai Nicusan<sup>6,7</sup> | Mariana Albuca<sup>8</sup> | Paul K. Ahrens<sup>9</sup> | Yves Ilied<sup>10</sup> | Marcu Roca<sup>11,12</sup> | Carol Boggs<sup>13,14</sup> | Jacques Brodeur<sup>15</sup> |

## Approaching a state shift in Earth's biosphere

Andrew D. Barnosky<sup>1,2,3</sup>, Elizabeth A. Hadly<sup>4</sup>, and Giovanni S. Orsi<sup>5</sup>, Aron J. Benson<sup>6</sup>, Michael Bernhardt<sup>7</sup>, Wayne M. Getz<sup>8</sup>, John Harshbarger<sup>9</sup>, Alan Hastings<sup>10</sup>, Pablo A. Marquet<sup>11,12,13</sup>, Neil D. Martinson<sup>14</sup>, Anna Mayer<sup>15</sup>, Peter Rosenzweig<sup>16</sup>, Gersoni Veronesi<sup>17</sup>, John W. Willgoose<sup>18</sup>, Susanna W. Gilgison<sup>19</sup>, Ineke Kitten<sup>20</sup>, Charles Marshall<sup>21</sup>, Nicholas Matlack<sup>22</sup>, David P. Mindes<sup>23</sup>, Sky Novella<sup>24</sup> & Adam B. Shatz<sup>25</sup>

## Article

### Worldwide occurrence records suggest a global decline in bee species richness

Eduardo E. Zaffari<sup>1,2,3</sup> and Marcelo A. Aizen<sup>4</sup>

## Viewpoint

### World Scientists' Warning to Humanity: A Second Notice

WILLIAM J. RIPPLE, CHRISTOPHER WOLF, THOMAS M. NEWSOME, WALDO SALETTI, MOHAMMED ALAMAR, EILEEN CRIST, MAHMOUD I. MAHMOUD, WILLIAM F. LAURANCE, and 15,286 scientist signatories from 186 countries

### Underestimating the Challenges of Avoiding a Ghastly Future

Corey J. A. Bradshaw<sup>1,2</sup>, Paul R. Ditchin<sup>3</sup>, Andrew Beattie<sup>4</sup>, Gerardo Caballero<sup>5</sup>, Eileen Crist<sup>6</sup>, Joan Diamond<sup>7</sup>, Rodolfo Dirzo<sup>8</sup>, Aron J. Shatz<sup>9</sup>, John Harshbarger<sup>10</sup>, Mary Ellen Hart<sup>11</sup>, Graham Pyle<sup>12</sup>, Peter M. Raven<sup>13</sup>, William J. Ripple<sup>14</sup>, Priscilla Kretz<sup>15</sup>, Christine Turnbull<sup>16</sup>, Martin Wehner<sup>17</sup>, and Daniel F. Saxena<sup>18,19</sup>

### Global risk of deadly heat

Carilo Mora<sup>1</sup>, Bénédicte Dessée<sup>2</sup>, Iain R. Caldwell<sup>3</sup>, Farrah E. Powell<sup>4</sup>, Rolán C. Geronimo<sup>5</sup>, Coral R. Bielecki<sup>6</sup>, Chelsie W. W. Coursee<sup>7</sup>, Bernis S. Dietrich<sup>8</sup>, Emily T. Johnston<sup>9</sup>, Leo V. Louis<sup>10</sup>, Matthew P. Lucas<sup>11</sup>, Marie M. McKenzie<sup>12</sup>, Alexandra G. Shea<sup>13</sup>, Han Tseng<sup>14</sup>, Thomas W. Giambelluca<sup>15</sup>, Lisa R. Leon<sup>16</sup>, Ed Hawkins<sup>17</sup> and Clay Trauernicht<sup>18</sup>

## Viewpoint

### World Scientists' Warning of a Climate Emergency

WILLIAM J. RIPPLE, CHRISTOPHER WOLF, THOMAS M. NEWSOME, RHODES BARNARD, WILLIAM R. MOOMAN, and 11,218 SCIENTIST SIGNATORIES FROM 183 COUNTRIES (LIST IN SUPPLEMENTAL FILE S1)



## REVIEW

### Scientists' warning to humanity on tree extinctions

Melina Rioser<sup>1</sup> | Ailien C. Nuytem<sup>2</sup> | Sara Oulfs<sup>3</sup> | Global Tree Assessment Centre<sup>4</sup>

## Co-extinctions annihilate planetary life during extreme environmental change

Giovanni Strona<sup>1</sup> & Corey J.A. Bradshaw<sup>2</sup>

## More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Casper A. Helgason<sup>1</sup>, Martin Berg<sup>2</sup>, Inke Jungmann<sup>3</sup>, Heik Eklöv<sup>4</sup>, Nick Holmala<sup>5</sup>, Heinz Schwarz<sup>6</sup>, Werner Steinmann<sup>7</sup>, Andreas Iller<sup>8</sup>, Hubert Suranow<sup>9</sup>, Thomas Honek<sup>10</sup>, Dave Coulson<sup>11</sup>, Hans de Kroon<sup>12</sup>

## Review

### Further evidence for a global decline of the entomofauna

François Sacher<sup>1,2,3,4</sup> and Kris A. Wykowski<sup>5,6</sup>



## The quiet crossing of ocean tipping points

Christopher Haines<sup>1,2</sup>, Thorsten Blumberg<sup>3</sup>, Helena Martin<sup>4</sup>, Giuseppe Bertoldi<sup>5</sup>, Neil Ditcher<sup>6</sup>, Marco Galassi<sup>7</sup>, Nicolas Gruber<sup>8</sup>, Elizabeth Hollibaugh<sup>9</sup>, Dylan Howe<sup>10</sup>, Fatenah Joss<sup>11</sup>, John Josey<sup>12</sup>, Mark Johnson<sup>13</sup>, Neil Johnson<sup>14</sup>, and Brian Wilson<sup>15</sup>

## Outside the Safe Operating Space of a New Planetary Boundary for Per- and Polyfluoroalkyl Substances (PFAS)

Jan T. Coxson<sup>1</sup>, Jana H. Johansson<sup>2</sup>, Matthew E. Salter, Bo Sha, and Martin Scheringer

# Overview of the biophysical landscape

## Energy

- **Fossil fuels** and the carbon pulse
- **Peak** of conventional **oil** cleared circa 2008 (IEA)
- No past energy transition; only **additions** and **synergies**

## Climate

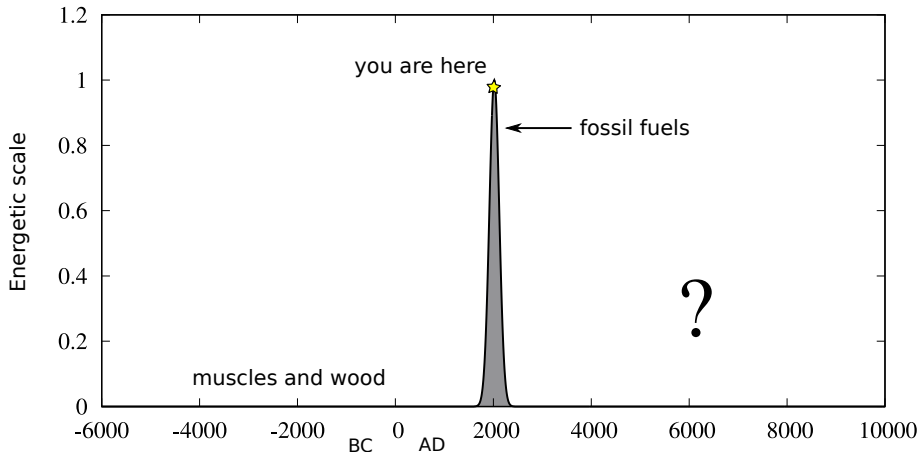
- **Anthropogenic** climate change
- 'Faustian bargain' of **cooling aerosols**
- Climatic feedback loops and **tipping points**
- Risk of **runaway** climate change to 'Hothouse Earth'

## Ecology

- Accelerated erosion of **biodiversity**
- Plunging **populations** across species/taxa
- Onset of the sixth **mass extinction**
- Sustained **ecological overshoot** (since 1970)
- Many transgressed **planetary boundaries**

# Overview of the biophysical landscape

A historical perspective on energy



# Overview of the biophysical landscape

## A geological perspective on climate

CO<sub>2</sub> concentration level

400 ppm

350 ppm

300 ppm

250 ppm

200 ppm

150 ppm

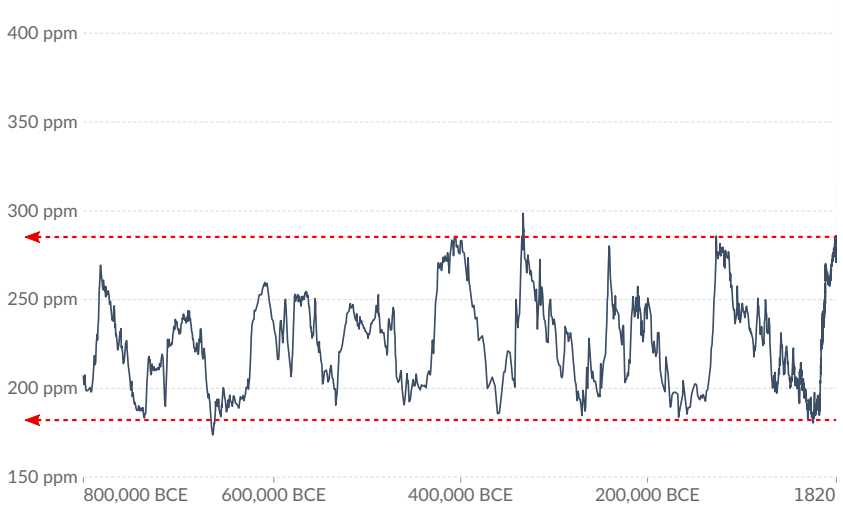
800,000 BCE

600,000 BCE

400,000 BCE

200,000 BCE

1820



Source: National Oceanic and Atmospheric Administration (NOAA)

# Overview of the biophysical landscape

A geological perspective on climate

CO<sub>2</sub> concentration level



Source: National Oceanic and Atmospheric Administration (NOAA)



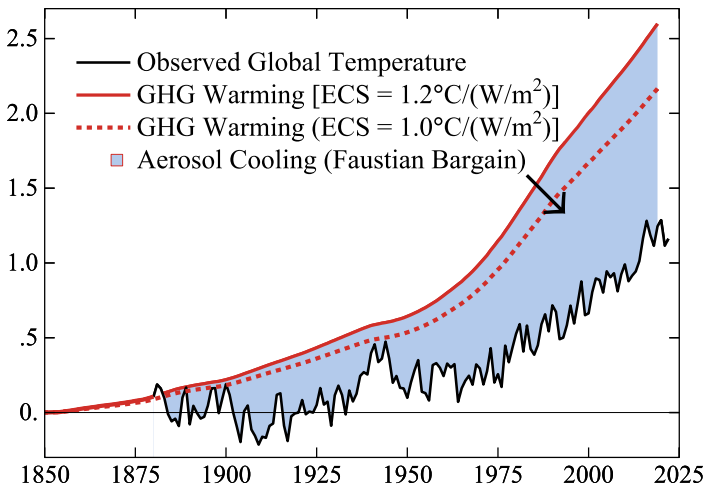
# Overview of the biophysical landscape

A geological perspective on climate



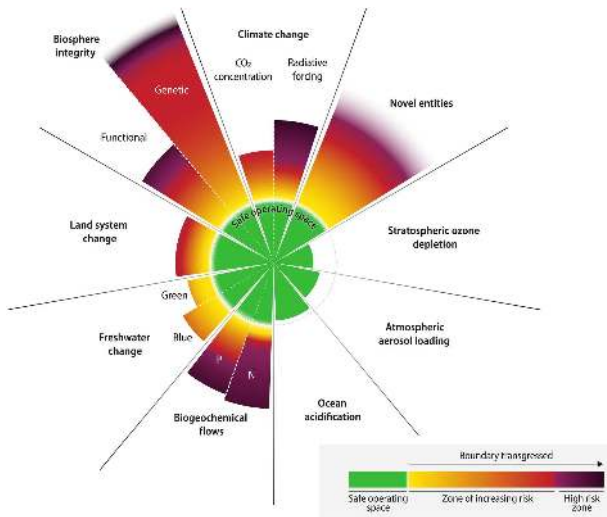
# Overview of the biophysical landscape

The 'Faustian bargain' of aerosol cooling



# Overview of the biophysical landscape

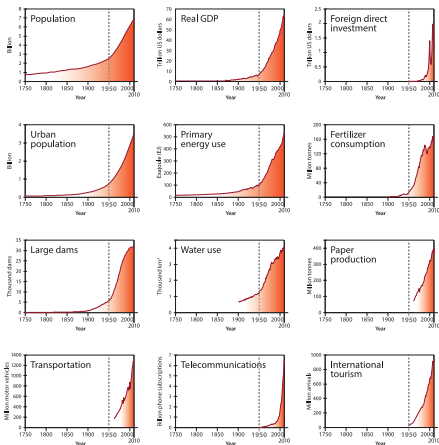
A global sustainability perspective on the Earth system



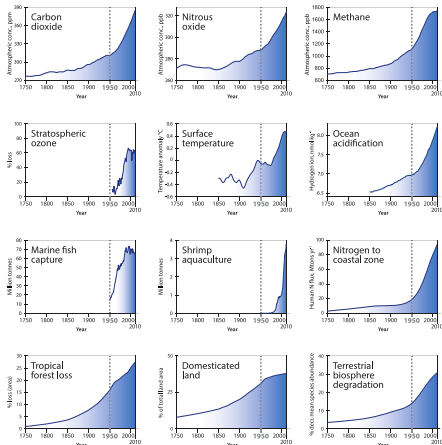
# Overview of the biophysical landscape

## The Great Acceleration since post-WWII

### Socio-economic trends

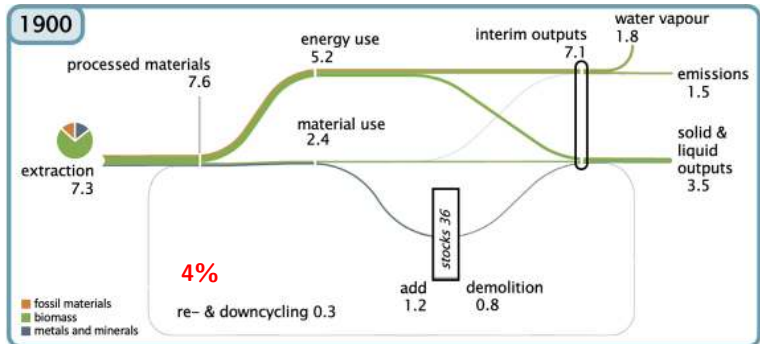


### Earth system trends



# Overview of the biophysical landscape

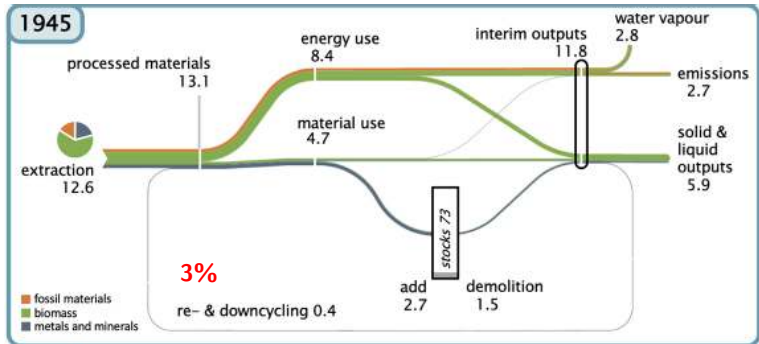
A growing, linear economy on a *finite* planet



Extraction → Production → Consumption → Entropic waste

# Overview of the biophysical landscape

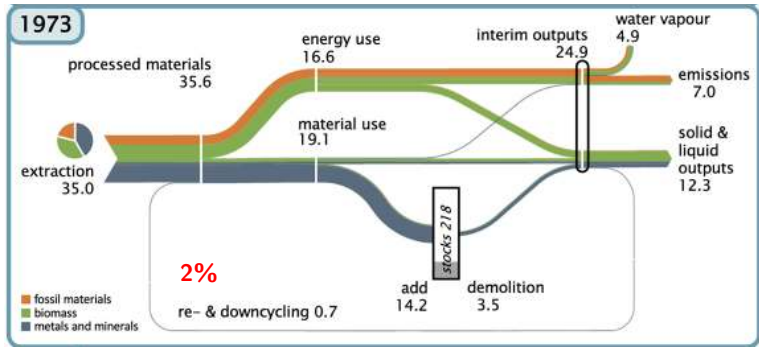
A growing, linear economy on a *finite* planet



Extraction → Production → Consumption → Entropic waste

# Overview of the biophysical landscape

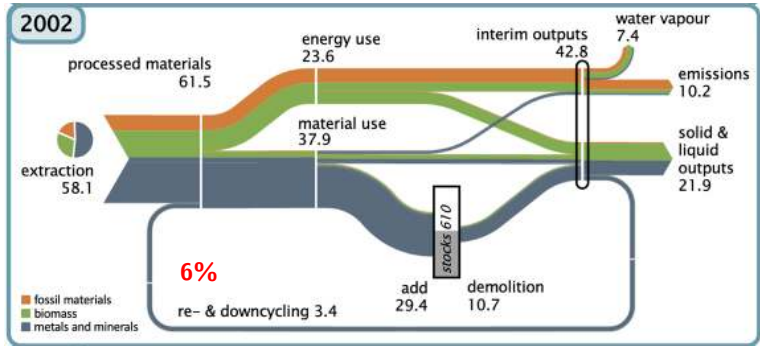
A growing, linear economy on a *finite* planet



Extraction → Production → Consumption → Entropic waste

# Overview of the biophysical landscape

A growing, linear economy on a *finite* planet



Extraction → Production → Consumption → Entropic waste





# A diversity of analyses and interpretations

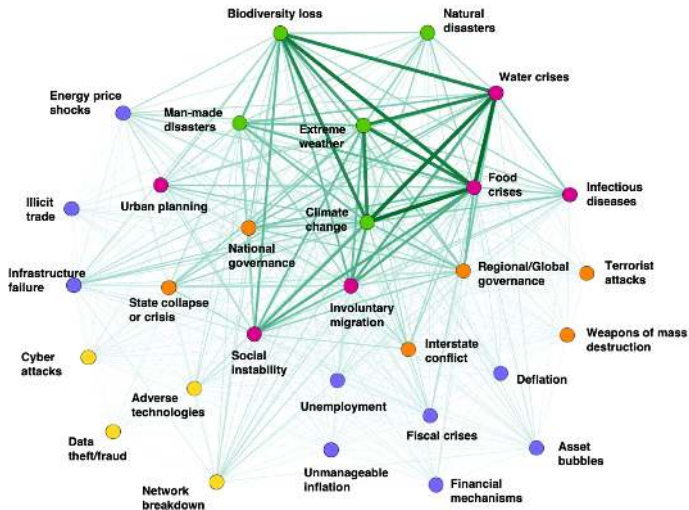
Name	Definition	Driving force	Perspective
Anthropocene	Epoch of human beings	<i>Homo sapiens</i>	Geological
Anglocene	Epoch of the British	Industrialization	Historical
Carbocene	Epoch of carbon	Fossil fuels	Energetic
Capitalocene	Epoch of the Capital	Capitalist economy	Economic
Plantationocene	Epoch of plantations	Colonization, slavery	Political Geo.
Occidentalocene	Epoch of the West	Western Modernity	Cultural
Molysmocene	Epoch of human waste	Productivism	Geological
Thanatocene	Epoch of destruction	War, militarization	Historical
Pathocene	Epoch of pathologies	Exploitation of life	Ecological
Megalocene	Epoch of <i>hubris</i>	Worldview, ethics	Cultural
Technocene	Epoch of technology	Technical means	Technical
Oliganthropocene	Epoch of a few men	Ruling classes	Political

# A diversity of analyses and interpretations

Name	Definition	Driving force	Perspective
Anthropocene	Epoch of human beings	<i>Homo sapiens</i>	Geological
Anglocene	Epoch of the British	Industrialization	Historical
Carbocene	Epoch of carbon	Fossil fuels	Energetic
Capitalocene	Epoch of the Capital	Capitalist economy	Economic
Plantationocene	Epoch of plantations	Colonization, slavery	Political Geo.
<b>Occidentalocene</b>	<b>Epoch of the West</b>	<b>Western Modernity</b>	<b>Cultural</b>
Molysmocene	Epoch of human waste	Productivism	Geological
Thanatocene	Epoch of destruction	War, militarization	Historical
Pathocene	Epoch of pathologies	Exploitation of life	Ecological
Megalocene	Epoch of <i>hubris</i>	Worldview, ethics	Cultural
Technocene	Epoch of technology	Technical means	Technical
Oliganthropocene	Epoch of a few men	Ruling classes	Political

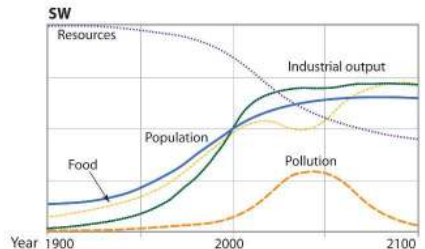
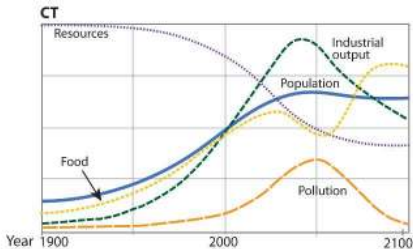
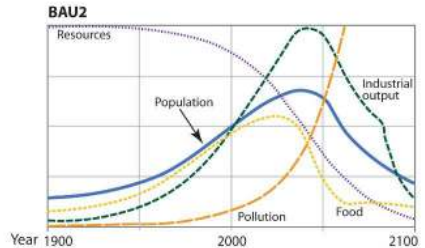
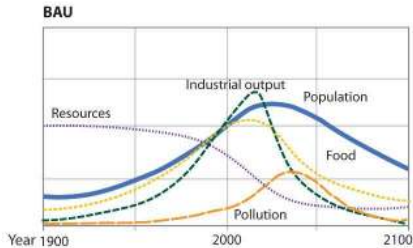
# A system's perspective on our predicament

An increasing number of interconnected global systemic risks



# A system's perspective on our predicament

Risk of collapse from delayed response to prolonged overshoot



# A system's perspective on our predicament

Risk of collapse from delayed response to prolonged overshoot

*Our results show that the continuation of current trends will derive in **biophysical scarcities** and impacts which will most likely derive in regionalization, **conflict**, and ultimately **global crisis**, leading to the **collapse of our modern civilization**. Despite depicting a much more worrying future than conventional projections of current trends, **this scenario seems a more realistic counterfactual scenario** that will allow the design of improved alternative sustainable pathways in future work.*

## *Homo energeticus*: a species out of context

*The pace of change is unprecedented — the recent spurt of population, economic and consumption growth that people today consider to be the norm actually represents **the single most anomalous period in human history**.*

*Humanity is literally converting the ecosphere into human bodies, prodigious quantities of cultural artifacts, and vastly larger volumes of entropic waste. (That's what tropical deforestation, fisheries collapses, plummeting biodiversity, ocean pollution, climate change, etc. are all about.)*

— William E. Rees

# The modern civilization put into perspective

Phenomenon	Age	Lifetime	Year	Day
Universe	13.8 Gyr	70 yr		
Solar System	4.5 Gyr	23 yr		
Life on Earth	3.5 Gyr	18 yr		1 d
Mammal “rule”	65 Myr	4 mo		25 min
First humans	3 Myr	6 d	1 yr	1 min
<i>Homo sapiens</i>	300 kyr	12 h	1 mo	7 s
Civilization	10 kyr	25 min	1 d	0.25 s
Scientific method	400 yr	1 min	1 h	10 ms
Fossil fuels	200 yr	30 s	35 m	5 ms
Biotic collapse	50 yr	8 s	10 m	1 ms



# The modern civilization put into perspective

	Phenomenon	Age	Lifetime	Year	Day
	Universe	13.8 Gyr	70 yr		
	Solar System	4.5 Gyr	23 yr		
	Life on Earth	3.5 Gyr	18 yr		1 d
	Mammal "rule"	65 Myr	4 mo		25 min
	First humans	3 Myr	6 d	1 yr	1 min
	<i>Homo sapiens</i>	300 kyr	12 h	1 mo	7 s
	Civilization	10 kyr	25 min	1 d	0.25 s
	Scientific method	400 yr	1 min	1 h	10 ms
	Fossil fuels	200 yr	30 s	35 m	5 ms
	Biotic collapse	50 yr	8 s	10 m	1 ms

Great Acceleration

↓

Industrial civilization

↓

Modernity

↓

## The modern civilization put into perspective

*Humans are: a biological species; one of millions; relatively new to the planet; needed by few but needing many; part of nature; belonging to Earth and no other place. Moreover, many humans on the planet are: only very recently experimenting with modernity; operating without explicit regard for ecological consequences; rapidly spending a material inheritance; boasting a population temporarily swollen on the fruits of that inheritance; carrying out enormous ecological damage as a thoughtless by-product of energy and material expenditures; running a system predicated on something as obviously and inherently unsustainable as growth; purposefully decontextualizing our lives by separating further from nature; powerful enough to have initiated a sixth mass extinction; collectively arrogant enough to think we're getting away with it; short-lived enough to not appreciate the magnitude of the insanity; unaccustomed to thinking about context, as lives are increasingly structured around narrow concerns.*

## The modern civilization put into perspective

*Humans are: a biological species; one of millions; relatively new to the planet; needed by few but needing many; part of nature; belonging to Earth and no other place. Moreover, many humans on the planet are: only **very recently experimenting with modernity**; operating without explicit regard for ecological consequences; rapidly spending a material inheritance; boasting a population temporarily swollen on the fruits of that inheritance; carrying out enormous ecological damage as a thoughtless by-product of energy and material expenditures; running a system predicated on something as obviously and inherently unsustainable as growth; **purposefully decontextualizing our lives by separating further from nature; powerful enough to have initiated a sixth mass extinction; collectively arrogant enough to think we're getting away with it; short-lived enough to not appreciate the magnitude of the insanity; unaccustomed to thinking about context, as lives are increasingly structured around narrow concerns.***

## A set of principles framing what follows

- 1 Humans are a **part of nature**, not apart from nature
- 2 Non-renewable materials cannot be harvested indefinitely on a **finite planet**
- 3 The ability of **Earth's ecosystems** to assimilate pollution without consequences is finite
- 4 **Energy** throughput is essential to all human activities, including the **economy**
- 5 Technology is a tool for deploying, not creating energy
- 6 Fossil fuel combustion is the primary cause of ongoing **global climate change**
- 7 **Exponential growth**, of physical or economic form, **must eventually cease**
- 8 Today's choices can simultaneously create problems for and deprive resources from **future generations**
- 9 Human behavior is consciously and unconsciously shaped by mental models of **culture** that, while mutable, **impose barriers to change**
- 10 Apparent success for a few generations during a massive draw-down of finite resources says little about chances for **long-term success**

## A set of principles framing what follows

- 1 Humans are a **part of nature**, not apart from nature
- 2 Non-renewable materials cannot be harvested indefinitely on a **finite planet**
- 3 The ability of **Earth's ecosystems** to assimilate pollution without consequences is finite
- 4 **Energy** throughput is essential to all human activities, including the **economy**
- 5 Technology is a tool for deploying, not creating energy
- 6 Fossil fuel combustion is the primary cause of ongoing **global climate change**
- 7 **Exponential growth**, of physical or economic form, **must eventually cease**
- 8 Today's choices can simultaneously create problems for and deprive resources from **future generations**
- 9 **Human behavior is consciously and unconsciously shaped by mental models of culture that, while mutable, impose barriers to change**
- 10 **Apparent success for a few generations during a massive draw-down of finite resources says little about chances for long-term success**

# Outlook

- 1 Some Context
- 2 Welcome to Modernity
- 3 The Myth of Progress [Idealism]
- 4 The Sources of Social Power [Materialism]

# Some definitions of Modernity

## Wikipedia

*Modernity, a topic in the humanities and social sciences, is both a **historical period** (the modern era) and the ensemble of particular socio-cultural **norms**, **attitudes** and **practices** that arose in the wake of the Renaissance — in the Age of **Reason** of 17th-century thought and the 18th-century **Enlightenment**.*

# Some definitions of Modernity

## Humanities dictionary

*Modernity is generally identified with the historical period that began in the **West** with the **Renaissance** (15th century). This new era was marked by far-reaching transformations that affected social structures (**urbanisation**, birth of **capitalism**, etc.), lifestyles and values (**individualism**, advent of civil **liberties**, **equal rights**), ideas (rise of **rational** thought and **science**, etc.) and politics (democratisation). Reason, the individual, **progress**, equality and freedom: these are the key words of modernity.*



# Some definitions of Modernity

## Encyclopædia Britannica

*[...] Modernity was associated with individual subjectivity, scientific explanation and rationalization, a decline in emphasis on religious worldviews, the emergence of bureaucracy, rapid urbanization, the rise of nation-states, and accelerated financial exchange and communication.*

# Some definitions of Modernity

## Encyclopædia Universalis

*Modernity is neither a sociological, nor a political, nor a historical concept. It is a characteristic **mode of civilisation**, opposed to the mode of tradition, i.e. to all other previous or traditional cultures: in the face of the geographical and symbolic diversity of these, modernity imposes itself as **one, homogenous**, radiating **worldwide** from the **West**. Yet it remains a confused notion, which globally connotes a whole **historical evolution** and a **change in mentality**.*

# The main categories of Modernity

## Socio-economic organization

- Capitalism
- Industrialism
- Urbanization
- Nation-states
- Bureaucracy
- Surveillance

## Cultural foundations

- Individualism
- Universalism
- Naturalism

## Cultural dynamics

- Secularization
- Rationalization

## Professed values

- Liberty
- Equality
- Justice

## Political ideologies

- Liberalism
- Socialism
- Fascism

# The main categories of Modernity

## Socio-economic organization

- Capitalism
- Industrialism
- Urbanization
- Nation-states
- Bureaucracy
- Surveillance

## Cultural foundations

- Individualism
- Universalism
- **Naturalism**

## Cultural dynamics

- Secularization
- **Rationalization**

## Professed values

- Liberty
- Equality
- Justice

## Political ideologies

- Liberalism
- Socialism
- Fascism

## One of four fundamental ontologies

**Ontology:** system of properties that humans ascribe to beings

---

ANIMISM

TOTEMISM

NATURALISM

ANALOGISM

---

## One of four fundamental ontologies

**Ontology:** system of properties that humans ascribe to beings

---

+ interiority

ANIMISM

- physicality

- interiority

NATURALISM

+ physicality

+ interiority

TOTEMISM

+ physicality

- interiority

ANALOGISM

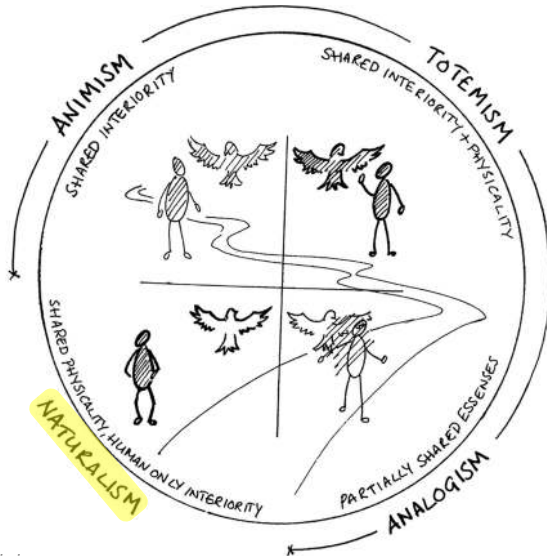
- physicality

---

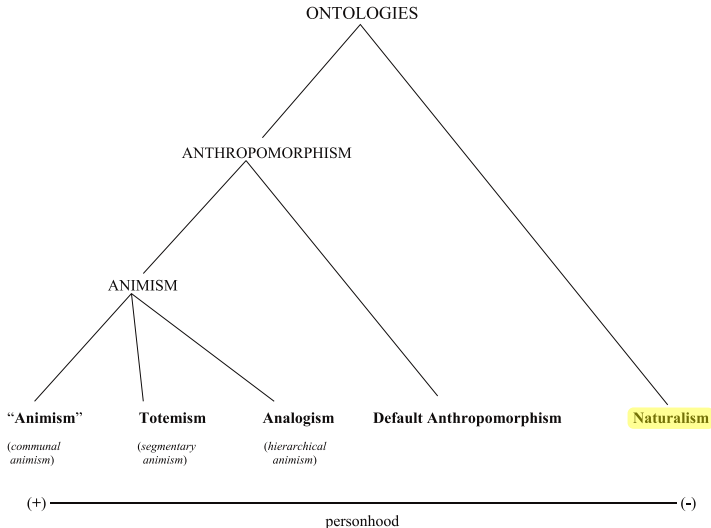
intentionality  
or selfhood

the ways in which  
bodies permit actions

# One of four fundamental ontologies



# One of four fundamental ontologies





# Dualism in the Western cultural tradition

## Mind/body split

*It is argued that a radical relocation of subjectivity began several thousand years ago. A subjectivity experienced in the centric region of the heart, and in the body as a whole, began to be avoided in favor of the eccentric head as a new location of subjectivity. In ancient literature, for example in Homer's epics, the heart and various other bodily organs were described as centers of subjectivity and organs of perception for spiritual experience and communion with others and the world. Mind and body were integrated. But also in the early historical record, as in the Old Testament, the heart and body were increasingly described as rebellious and rejected as impure. Head and heart, mind and body, became estranged. The body was judged an unsuitable, impure vessel for spiritual experience. This change in the location of subjectivity presaged the later development of Platonic, Gnostic, Christian, and Cartesian distinctions favoring mind over and against the body. It may also have contributed to some of the characteristic psychological and pathological processes (e.g., psychosomatic illnesses, repression, narcissism) currently attributed to the psychology of the modern Western, and specifically, North American self.*

# Dualism in the Western cultural tradition

Nature/nurture debate

<b>Nature</b>	<b>Nurture</b>
Heridity	Environment
Instinct	Learning
Human universals	Cultural relativism
Human nature	Human culture
Innate behavior	Aquired behavior
Chomsky	Piaget
Biol. determinism	Social determinism
Essentialism	Social construction

# Dualism in the Western cultural tradition

Nature/culture dichotomy



“External environment”

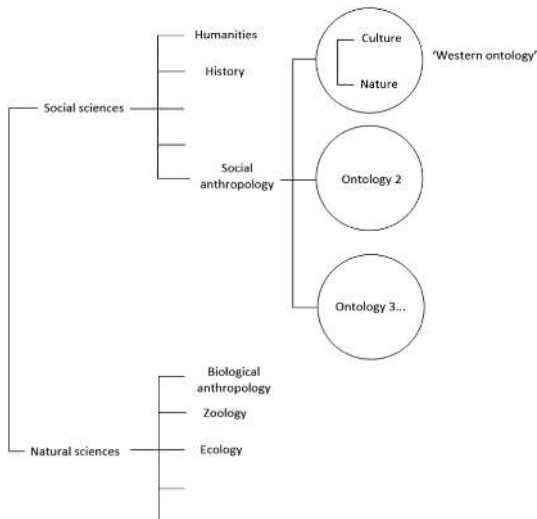
<b>Nature</b>	<b>Culture</b>
Natural	Human
Animal	Human
Biological	Social
Biological	Cultural
Physical	Mental
Body	Mind



“All human artifact”

# Dualism in the Western cultural tradition

## Nature/culture dichotomy



# Anthropocentrism, or human exceptionalism

Subject/object relationships

HUMAN  
EXCEPTIONALISM

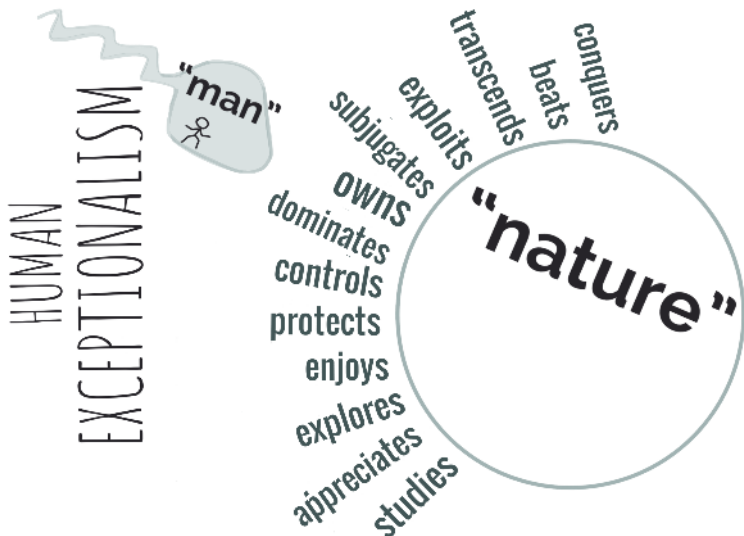
"man"  


versus  
and  
in  
~~is~~

"nature"

# Anthropocentrism, or human exceptionalism

Subject/object relationships



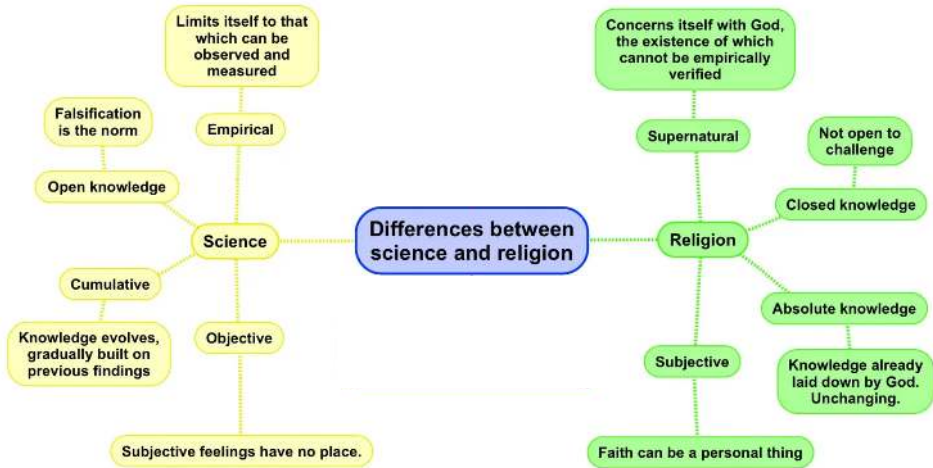
## Modernity's Promethean project

*Although the origin of the term “Modernity” and its chronological boundaries remain a source of academic debate, I hereby subscribe to an apprehension of modernity as a period that began in the 17th century—characterized by a new, forward looking world view and a new set of social expectations. The **taming of nature** became a major project within modernity’s broader aims, a project that scholars came to term “Promethean”. Within this context, the modern scientist or engineer would be the new Prometheus, who fights for human emancipation through the **domination of nature**. The modern hero would employ creativity, ingenuity, romantic heroic attitude, and a touch of hubris against the given order of the world. “Modernity’s Promethean project” would **defy the power of nature**, reject divine order, and launch on a quest to free Man (sic!) from his premodern fears, serve human needs and deliver social equity and material goods to everybody through progress, truth, reason, and rationality.*





# The rise of scientific rationality



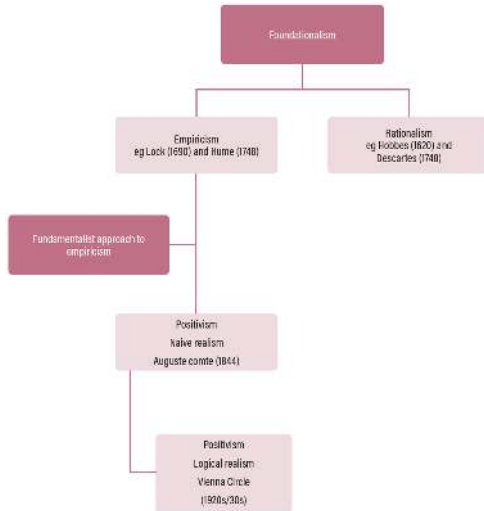
# The rise of scientific rationality

Scientific *versus* religious thinking?

	<b>Science</b>	<b>Religion</b>
Category	Rationality	Faith/Belief
Knowledge	Empirical	Supernatural
	Falsifiable	Dogmatic
	Cumulative	Absolute
	Open	Closed
	Objective	Subjective
Means	Experiments/Logic	Revelation
Laws	Natural	Divine

# The rise of scientific rationality

A religious or dogmatic side to science?



# The rise of scientific rationality

A religious or dogmatic side to science?

## Saint-Simonism

- Henri de Saint-Simon (1760-1825)
- Rationalist socio-political **ideology** and secular **religion**
- Idea of **progress** from science and industry; class of industrialists

## Positivism

- Auguste Comte (1798-1857)
- Philosophical school and secular **religion**
- “L’amour pour principe, l’ordre pour base, le **progrès** pour but.”

## Scientism

- Scientific **hegemony**: *unique* legitimate source of empirical knowledge
- Scientific **imperialism**: the need for a scientific organization of society
- Scientific authoritarianism, political technocracy, technological **salvation**

# Outlook

- 1 Some Context
- 2 Welcome to Modernity
- 3 The Myth of Progress [Idealism]**
- 4 The Sources of Social Power [Materialism]

# The Enlightenment, Modernity and Progress



Every new product, every new piece of legislation is vaunted as progress, progress for the better of course: our society no longer seems capable of escaping progress. But this assumption of an ascent that brings us indefinitely closer to an ideal end is, unfortunately, highly problematic. Georg Henrik von Wright, the Finnish philosopher who succeeded Ludwig Wittgenstein as Professor of Philosophy at Cambridge, sought to find in our historical past the forces that have driven evolution up to the present day. To 'dispel the fog that hangs over the **belief in progress**', von Wright shows how the term has evolved since the Renaissance; how it is closely linked to the **Enlightenment** and to '**modernity**'.

# The Modern Myth of Progress

*'The myth of progress' is a relatively recent belief that is a fundamental component of what we can call **classical modernity**. The most characteristic aspect of this modernity's representation of the **future of humanity** was precisely the **belief in progress**. 'Not just temporary progress', von Wright specifically states, 'or progress contingent upon the lasting good will of men, but progress **unbounded** and **everlasting**, progress as something **natural** and **necessary**. This is a new conception in the history of ideas. I shall call it the Modern Myth of Progress'.*

# Dispelling the Modern Myth of Progress

*Homo sapiens* is one biological species among many

*In Science and Reason (late 1986–early 1987), von Wright brought under scrutiny some of the most fundamental of our current beliefs, in particular the belief in progress. He reminded us, on the one hand, that the human species is subject to the same law of precariousness and extinction as other species—and nothing allows us to affirm it will not disappear in the near future, for example in a nuclear war—and on the other hand that nothing guarantees that the industrial form of production is biologically adapted to humanity, nor, more generally, that this species is still capable of adapting to an environment it has participated in transforming in such a spectacular and rapid way.*



# Dispelling the Modern Myth of Progress

Rationality is no guarantee of self-regulation

*[...] the **industrial** form of production is grounded in **technology**, which is grounded in turn in the **scientific** knowledge of **nature**. In the final analysis, it thus emanates from man's **rational** disposition. If we are inclined to **believe** that reason has an intrinsic capacity to respect the biological conditions of man's existence on earth, we can then **hope** that an in-depth knowledge of these conditions will also have a **regulatory effect** on the forces that have final control over the management of industrial production.*

# Dispelling the Modern Myth of Progress

Progress in material well-being (for some) needs not last

*One thing which **power over nature** can achieve is to increase the **material** well-being of men. Of this, **industrial** and **technological** developments give impressive evidence. There can be no question but that enhanced material well-being, standard of living, in many, perhaps most, cases is progress in a genuine sense of the word. This means that it is **valued**, by those who benefit from it, as an improvement of their lives. But it is **not necessary** that this valuation will persist when **growth** has reached above a certain level or when its repercussions on the **environment** or on the **social order** have to be taken into account.*

# Dispelling the Modern Myth of Progress

Progress is “needed” to solve the problems *it* generates

*Kraus describes progress as the prototype for a mechanical or quasi-mechanical process, self-sustaining and self-maintained, that creates in each instance the conditions of its own perpetuation, in particular by producing drawbacks, inconveniences and damages that only new progress can enable us to overcome. The fact that, as von Wright states, ‘continuous economic growth is a condition of the solution to the problems that intensified and rationalized industrial production itself creates,’ is a typical illustration. It would seem that additional growth is necessary to solve the problems posed by growth, particularly in matters of the damage inflicted to the environment and of the worsening poverty that reigns in certain regions of the world.*

# Technical innovations and Progress



R. Dufy, *La Fée Électricité*, 1937 (Musée d'Art moderne, Paris, France)



J. Gast, *American Progress*, 1872 (Autry Museum of the American West, Los Angeles, USA)

## Colonialism and Progress



Cover of a French school book, circa 1900



# Questioning the reality of Progress

WWI and chemical warfare



# Questioning the reality of Progress

WWII and atomic warfare





# Questioning the reality of Progress

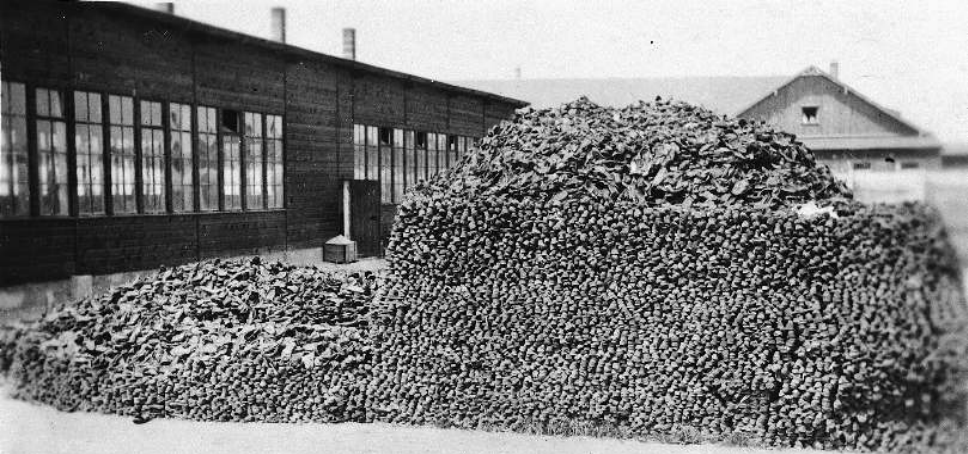
WWII and atomic warfare

*If there is anything in the consciousness of people today that has the value of the Absolute or the Infinite, it is not the power of God or the power of nature, or even the so-called powers of morality or culture: it is **our own power**. Creation ex nihilo, which was a manifestation of omnipotence, has been replaced by the opposite power: **the power to annihilate**, to reduce to nothingness—and this power is in our hands. The omnipotence long desired in a Promethean way has indeed become ours, even if not in the form we had hoped for. Since we now possess the power to destroy each other, we are **the lords of the apocalypse**. We are **the Infinite**.*

# Questioning the reality of Progress

WWII and atomic warfare

*[...] These men who are now the lords of the Infinite are, from the point of view of imagination or feeling, as little up to the power they wield as we, their eventual victims. They are and can only be incapable of seeing their instrument as anything other than a means to serve finite interests—when these are not the shortest partisan aims. And we, the people of today, who are the first to dominate the apocalypse, are also the first to live under its constant threat. Being the first titans, we are also the first dwarfs or pygmies—however we choose to describe ourselves, we beings on borrowed time—to be mortal as a group and not as individuals, and to have the right to exist only until further notice.*



*The story of the organization of the Holocaust could be made into a textbook of scientific management.*

# Questioning the reality of Progress

## Bureaucracy, science, rationality and the Holocaust

*The unspoken terror permeating our collective memory of the Holocaust [...] is the gnawing suspicion that the Holocaust could be more than an aberration, more than a deviation from an otherwise straight path of progress, more than a cancerous growth on the otherwise healthy body of the civilized society; that, in short, the Holocaust was not an antithesis of modern civilization and everything (or so we like to think) it stands for. We suspect (even if we refuse to admit it) that the Holocaust could merely have uncovered another face of the same modern society whose other, more familiar, face we so admire. And that the two faces are perfectly comfortably attached to the same body. What we perhaps fear most, is that each of the two faces can no more exist without the other than can the two sides of a coin.*

# Questioning the reality of Progress

## Bureaucracy, science, rationality and the Holocaust

*At no point of its long and tortuous execution did the Holocaust come in conflict with the principles of rationality. The 'Final Solution' did not clash at any stage with the rational pursuit of efficient, optimal goal-implementation. On the contrary, it arose out of a genuinely rational concern, and it was generated by bureaucracy true to its form and purpose. We know of many massacres, pogroms, mass murders, indeed instances not far removed from genocide, that have been perpetrated without modern bureaucracy, the skills and technologies it commands, the scientific principles of its internal management. The Holocaust, however, was clearly unthinkable without such bureaucracy. The Holocaust was not an irrational outflow of the not-yet-fully-eradicated residues of pre-modern barbarity. It was a legitimate resident in the house of modernity; indeed, one who would not be at home in any other house.*

# Questioning the reality of Progress

Bureaucracy, science, rationality and the Holocaust

*[Auschwitz] was also a mundane extension of the **modern factory system**. Rather than producing goods, the raw material was human beings and the end-product was death, so many units per day marked carefully on the **manager's** production charts. The chimneys, the very symbol of the modern factory system, poured forth acrid smoke produced by burning human flesh. The brilliantly organized railroad grid of modern Europe carried a new kind of raw material to the factories. It did so in the same manner as with other cargo. In the gas chambers the victims inhaled noxious gas generated by prussic acid pellets, which were produced by the advanced **chemical industry** of Germany. **Engineers** designed the crematoria; **managers** designed the system of **bureaucracy** that worked with a zest and **efficiency** more backward nations would envy. Even the overall plan itself was a reflection of the **modern scientific spirit** gone awry. What we witnessed was nothing less than a massive scheme of **social engineering**...*

# The enduring Myth of Progress

Economic growth, democracy and progress

*The myth may be dead, but it lives on in derivative forces that identify progress either with **economic growth** or with **formalised democracy**. These petrified remnants of an originally optimistic belief continue to exert a strong influence as motivating forces. They motivate the actions and decisions of **technocrats** on the one hand and **politocrats** on the other.*

# The enduring Myth of Progress

Technology, innovation and progress

## Schools of thought

- Longtermism
- Transhumanism
- Accelerationalism
- Ecomodernism
- FALC

## Prominent individuals

- N. Bostrom, W. MacAskill, T. Ord
- N. Bostrom, R. Kurzweil, M. More
- M. Fisher, N. Land, N. Srnicek
- S. Brand, T. Nordhaus
- A. Bastani

## Organizations, research centers

- Centre for the Study of Existential Risk (Cambridge, UK)
- Future of Humanity Institute (Oxford, UK)
- Future of Life Institute (Cambridge, USA)
- Singularity University (Mountain View, USA)
- Breakthrough Institute (Berkeley, USA)



# The enduring Myth of Progress

Space, colonialism and progress

Elon Musk



Jeff Bezos



# The enduring Myth of Progress

Seabed, colonialism and progress

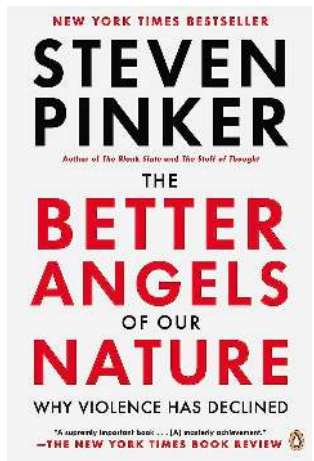
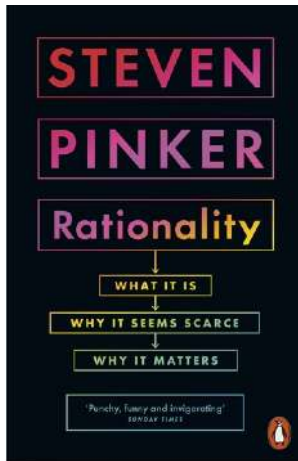
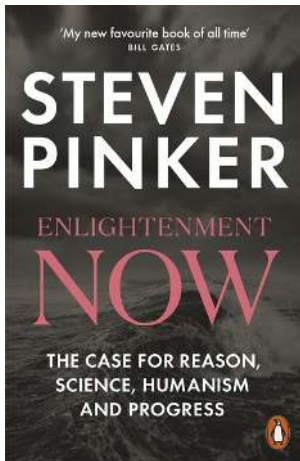
## Exploration for minerals in the Area



By May 2022, the ISA, which regulates activities in the seabed beyond national jurisdiction ('the Area'), had issued 31 contracts to explore deep-sea mineral deposits.

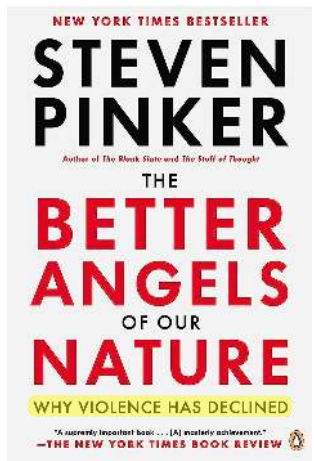
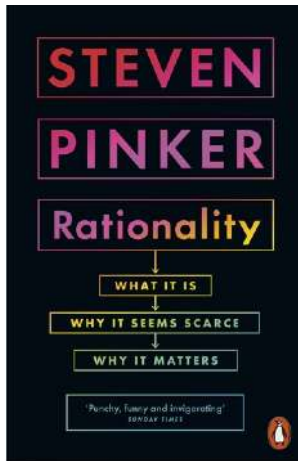
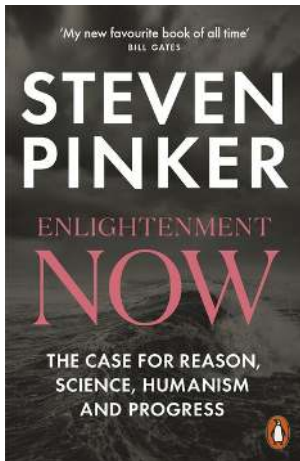
# The enduring Myth of Progress

Reason, science, humanism and progress

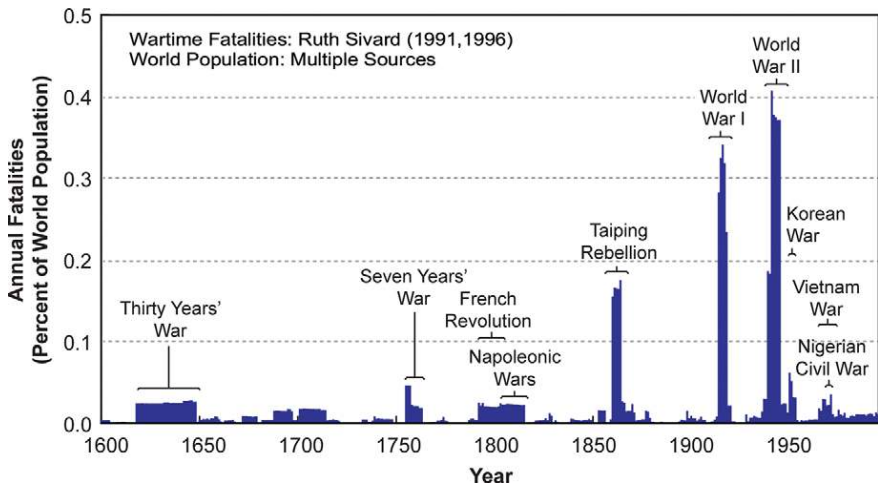


# The enduring Myth of Progress

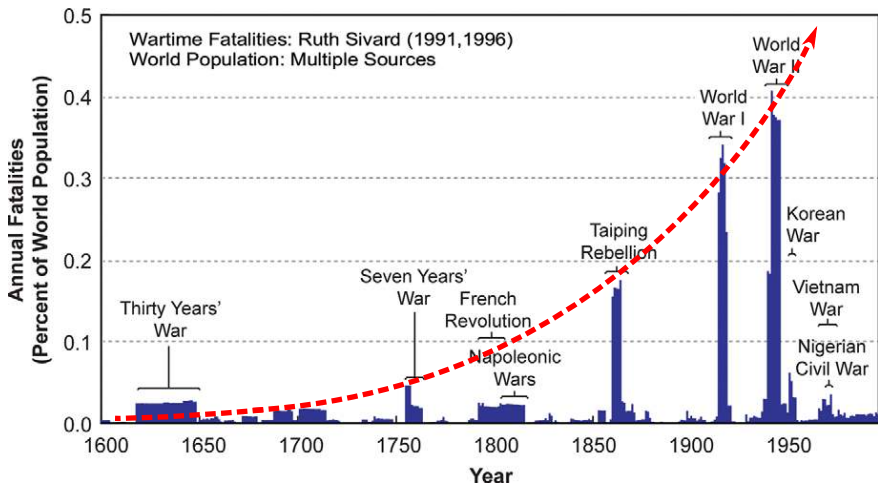
Reason, science, humanism and progress



## The world's inexorable pacification?



# The world's inexorable pacification?

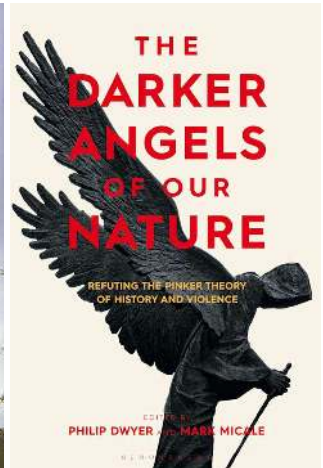
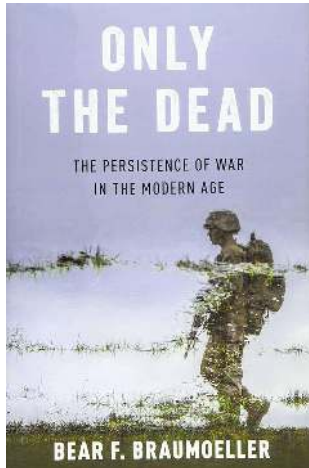
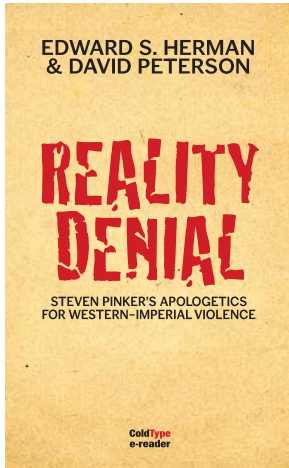








## The world's inexorable pacification?



## Some powerful myths shaping our times

Field	Myth	Debunking
Energetic	Past energy transitions	History of energy
Economic	Primitive bartering	Anthropology and ethnology
Economic	<i>Homo oeconomicus</i>	Sociology and psychology
Economic	Green growth	Biophysical economy
Political	Sustainable development	History and geopolitics
Political	Representation	History and sociology
Technical	Neutrality	Philosophy and sociology
Technical	Techno-solutionism	History and philosophy
Cultural	Human exceptionalism	Biology and ethology
Cultural	World pacification	History and anthropology
Cultural	Progress	History and philosophy

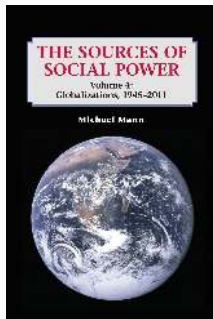
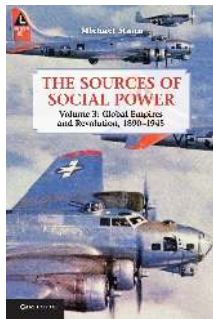
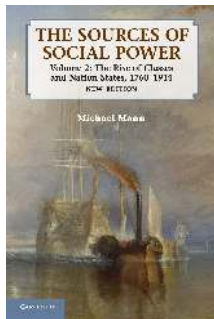
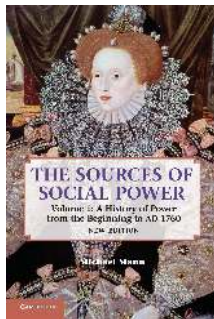
# Outlook

- ① Some Context
- ② Welcome to Modernity
- ③ The Myth of Progress [Idealism]
- ④ The Sources of Social Power [Materialism]

## Historical and comparative sociology

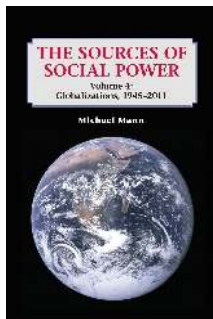
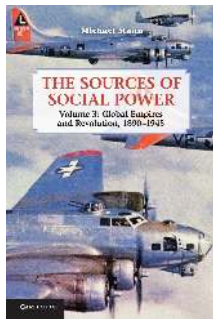
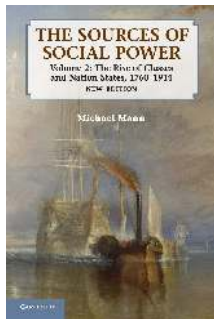
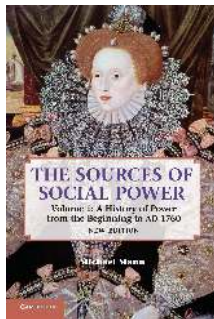
- Historical sociology is concerned with the development of **macro-social phenomena** without the presuppositions of a philosophy of history that seeks to establish causal relationships on the basis of a necessity or finality.
- It aims to describe the processes of **historical transformation** of social or anthropological facts in order to better understand the reality and the coherence of the cultural systems of our societies.
- It attempts to place social phenomena in their historical dimension to reveal the **different contexts** in which they have developed and with which they maintain a permanent relationship.
- Notable authors include E. Durkheim, N. Elias, M. Foucault, K. Marx, K. Polanyi, I. Wallerstein, M. Weber

# History through the lens of power relations



*Power is the capacity to get others to do things that they would otherwise not do. To achieve our **goals** — whatever they are — we enter into **power relations** involving both **cooperation** and **conflict** with other people, and these relations generate **societies**.*

# History through the lens of power relations

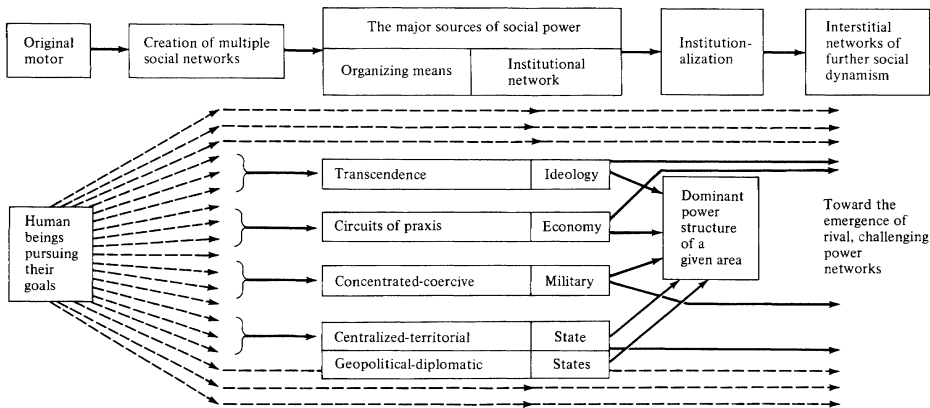


The sociologist Michael Mann identifies the four principal 'sources' of power in human societies as resulting from the control of **ideological**, **economic**, **military** and **political** resources.

# Four sources of power in human societies

- **Ideological power** derives from the human need to find ultimate meaning in life, to share norms and values, and to participate in aesthetic and ritual practices with others.
- **Economic power** derives from the human need to extract, transform, distribute, and consume the produce of nature.
- **Military power** is the social organization of concentrated and lethal violence.
- **Political power** is the centralized and territorial regulation of social life. The basic function of government is the provision of order over a given territory.

# The IEMP model of organization of power



## Key

- > denotes causal sequences too complex to be theorized
- > denotes causal sequences organized by the power sources and capable of being theorized



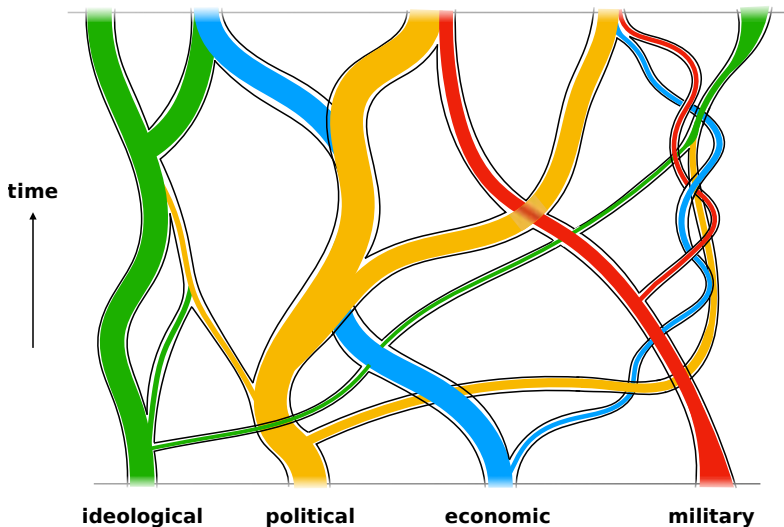
## The IEMP model of organization of power

*I operate at a more concrete, sociospatial and organizational level of analysis. The central problems concern organization, control, logistics, communication — the capacity to organize and control people, materials, and territories, and the development of this capacity through out history. The four sources of social power offer alternative organizational means of social control. In various times and places each has offered enhanced capacity for organization that has enabled the form of its organization to dictate for a time the form of societies at large. My history of power rests on measuring sociospatial capacity for organization and explaining its development.*

## The IEMP model of organization of power

*Readers of my first volume will be familiar by now with my argument that **the development of human societies can be explained in terms of the interrelations of four sources of social power** — ideological, economic, military, and political (the IEMP model). These sources generate networks of interaction whose boundaries do not coincide. Instead, **they overlap, intersect, entwine, and sometimes fuse, in ways that defy simple or unitary explanations of society given by social scientists.** More importantly, they also defy the ability of social actors to fully understand their social situation, and it is that uncertainty which makes human action somewhat unpredictable and which perpetually develops social change.*

## Interacting sociospatial networks of powers



# An example: the historical rise of the West

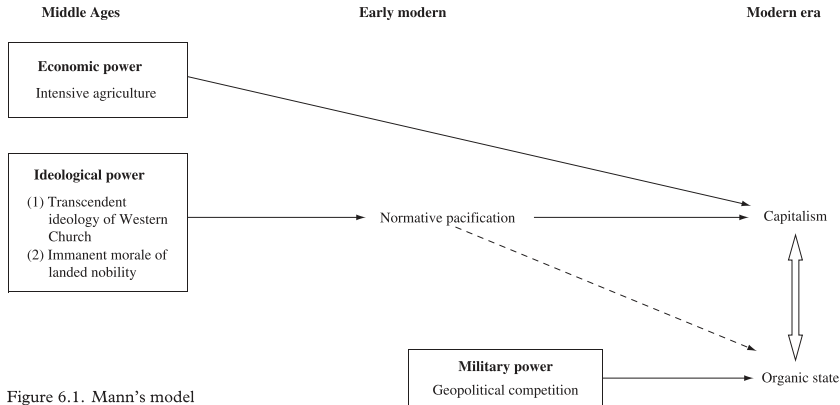


Figure 6.1. Mann's model

# An example: the historical rise of the West

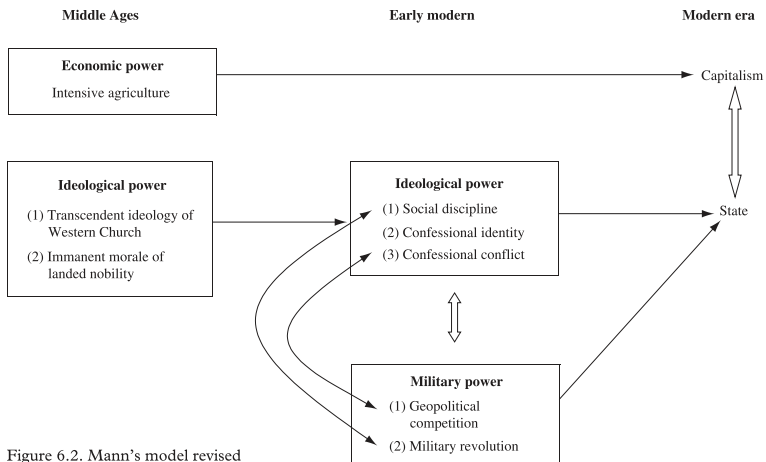


Figure 6.2. Mann's model revised

# Technoscience: a fifth source of power?

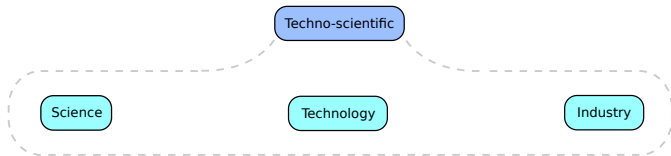
Ideological

Political

Economic

Military

# Technoscience: a fifth source of power?



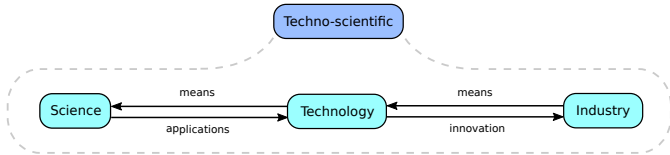
Ideological

Political

Economic

Military

# Technoscience: a fifth source of power?



Ideological

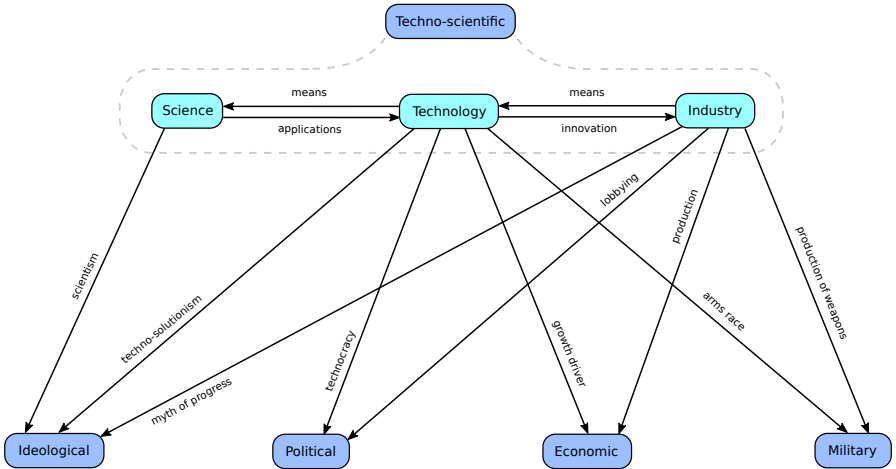
Political

Economic

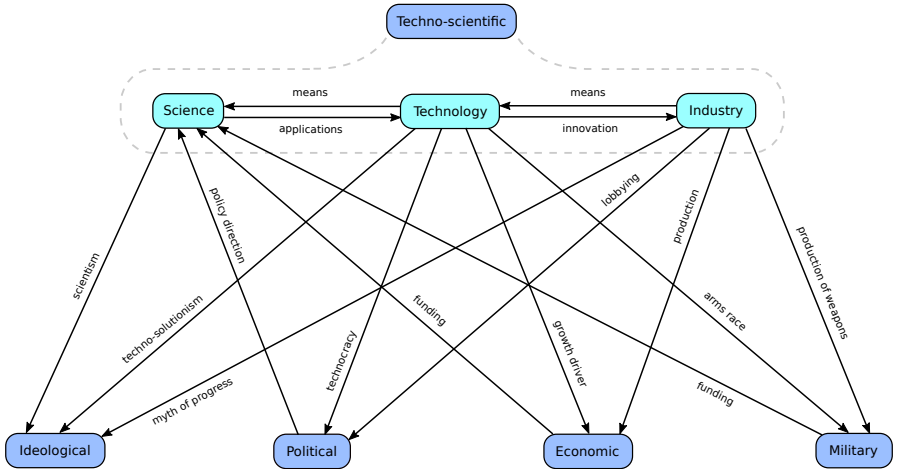
Military



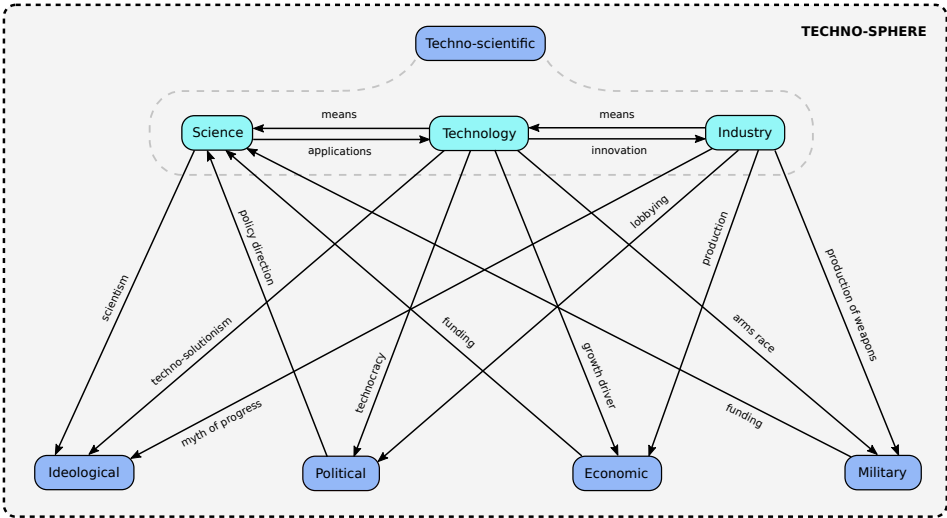
# Technoscience: a fifth source of power?



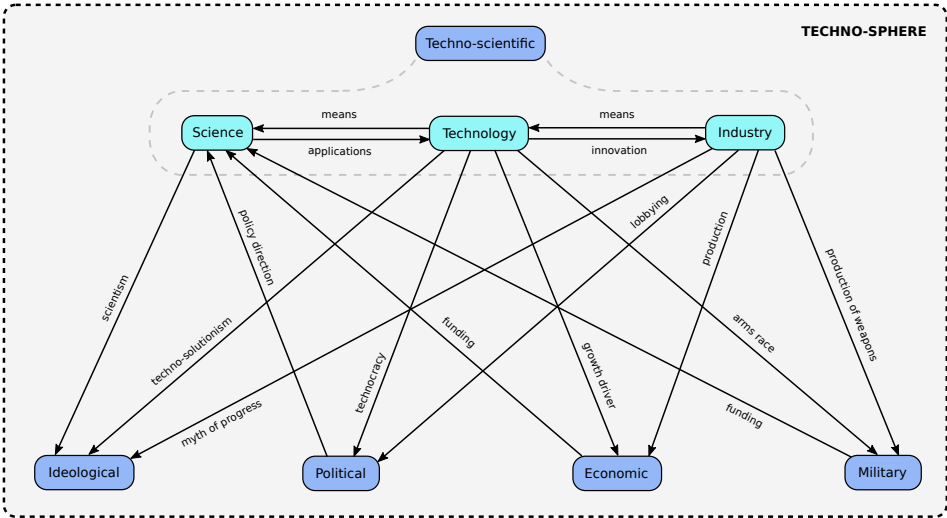
# Technoscience: a fifth source of power?



# Technoscience: a fifth source of power?



# Technoscience: a fifth source of power?



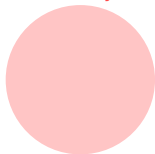
resources → technoscience → **power** → domination → oppression

# The Modern scene of social powers

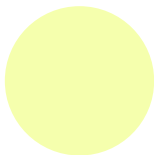
**Political**



**Military**



**Ideological**



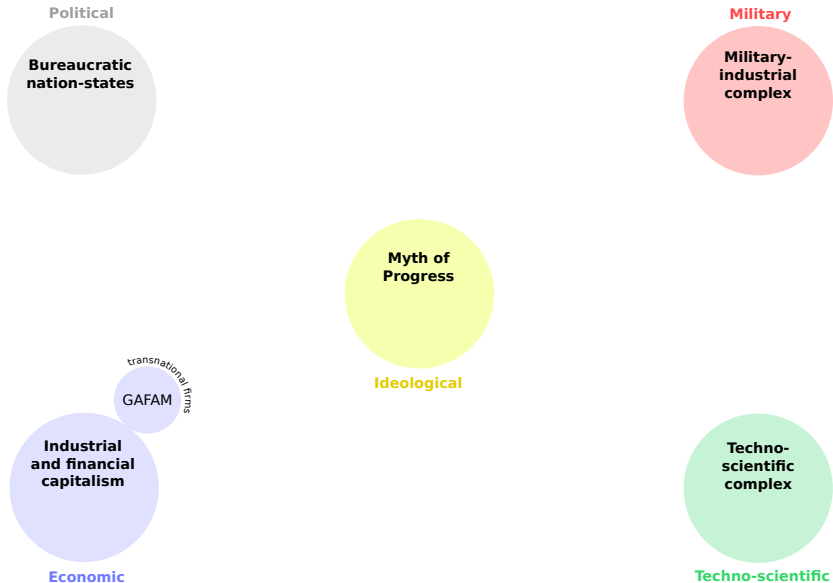
**Economic**



**Techno-scientific**



# The Modern scene of social powers



# The Modern scene of social powers

## Political

### **Bureaucratic nation-states**

*control  
regulation  
expansion*

## Military

### **Military- industrial complex**

*power  
superiority  
victory*

### **Myth of Progress**

*comfort  
deliverance  
transcendence*

## Ideological

transnational firms  
GAFAM

### **Industrial and financial capitalism**

*profits  
profitability  
accumulation*

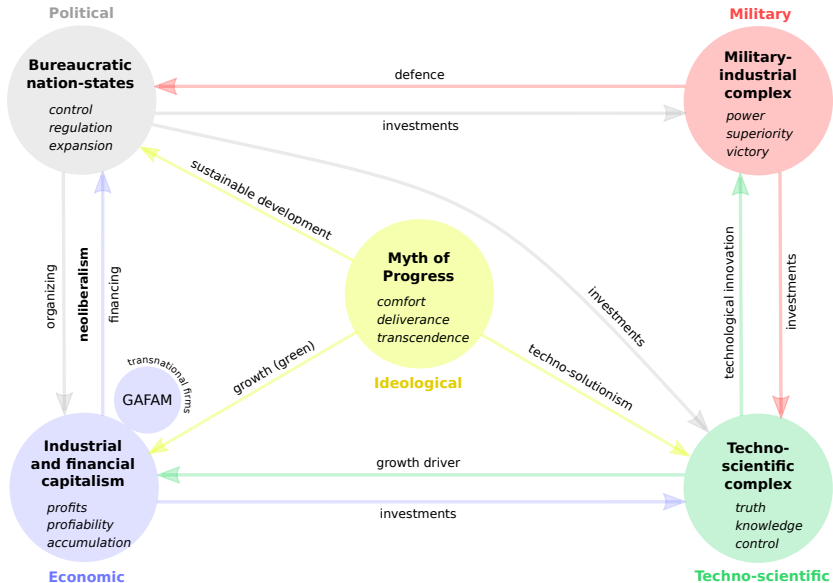
## Economic

### **Techno- scientific complex**

*truth  
knowledge  
control*

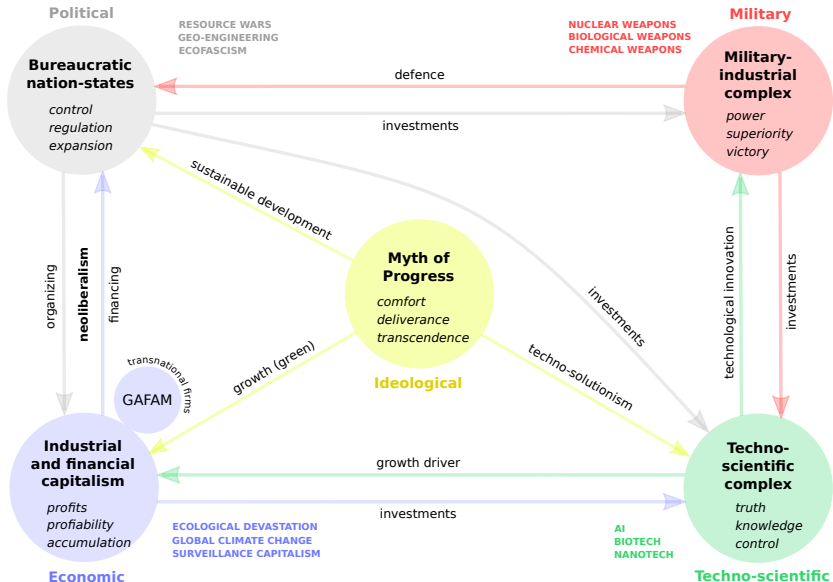
## Techno-scientific

# The Modern scene of social powers





# The Modern scene of social powers



## The Modern scene of social powers

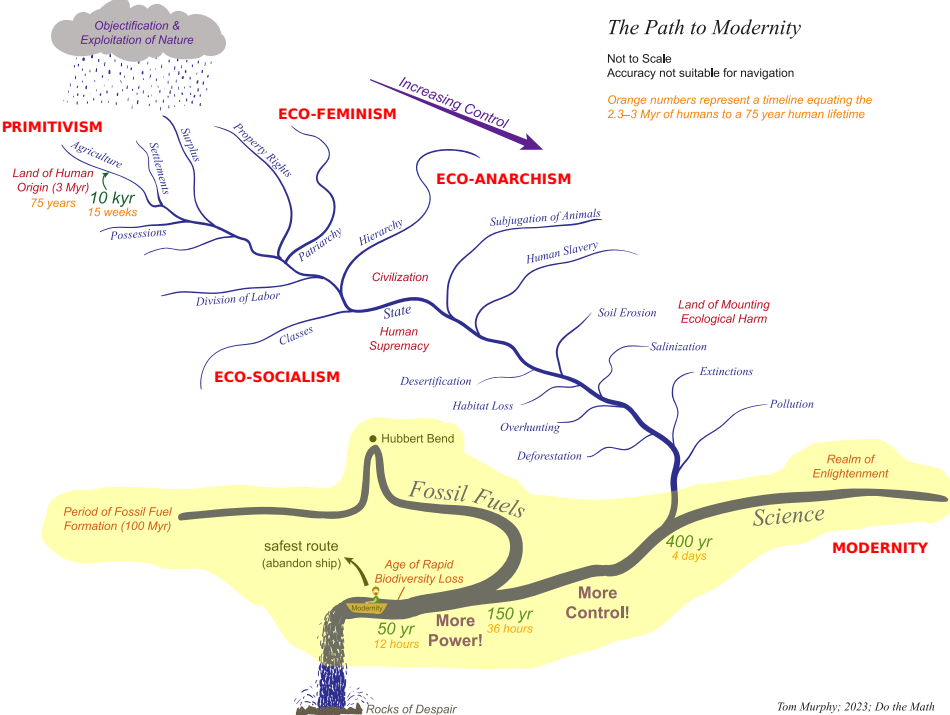
*[...] if the state is an ecocidal power, it is not only because it is instrumentalised by capital and subject to its interests, which could give the impression that the destructiveness of the state is linked to the specific historical circumstances which are ours, therefore that the problem lies with the capitalist state and that a state freed from the tutelage of capital could do the trick. Nothing is less true, because just as there is at the heart of **capitalism** a compulsion for **growth**, there is at the heart of the **state-form** a compulsion for **power**, the desire to accumulate **technological** and **military** power in order to remain competitive in interstate **rivalry**. But this accumulation necessarily involves **economic** and **financial** power, so it could be said that the state also uses capital to achieve its own ends. It has its own agenda, just as destructive.*



# The Path to Modernity

Not to Scale  
Accuracy not suitable for navigation

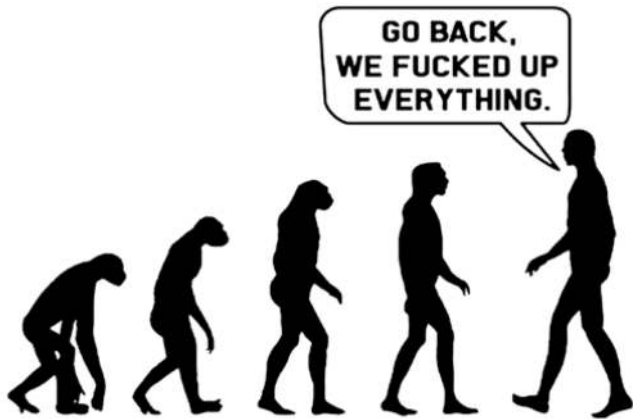
Orange numbers represent a timeline equating the 2.3–3 Myr of humans to a 75 year human lifetime



## Time to revisit the meaning of human history?

*It is high time to start wondering: are those forms of life-in-common, known to most of us solely from ethnographic reports sent back from the few remaining niches of bygone 'outdated and backward' times, irrevocably things of the past? Or is, perhaps, the truth of an alternative view of history (and so also of **an alternative understanding of 'progress'**) about to out: that far from being an irreversible dash forward, with no retreat conceivable, the episode of chasing happiness through shops was, is and will prove to be for all practical intents and purposes a one-off detour, intrinsically and inevitably temporary?*

Time to revisit the meaning of human history?



## Time to revisit the meaning of human history?

*To abandon belief in progress as a historical necessity is not to abandon work for progress as a task.*

— Georg Henrik von Wright

*Not everything that is faced can be changed; but nothing can be changed until it is faced.*

— James Baldwin

*Pessimism of the intellect, optimism of the will.*

— Romain Rolland