Reflections on Computer Science, Society and Ethics 1
Computer Science I:
The state of the world and computer science

Wolfgang Hofkirchner
IMC Krems, 16 March 2021

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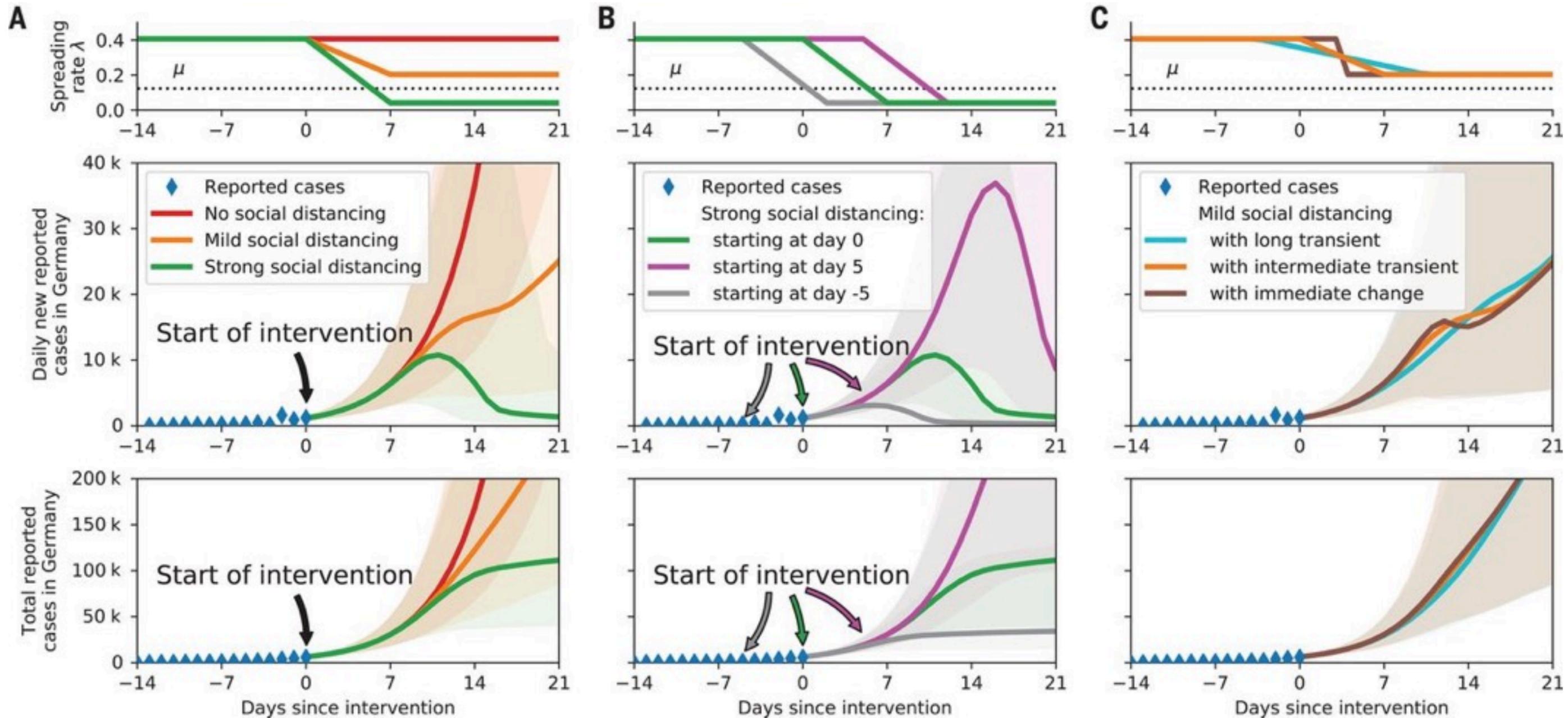
* Hans Joachim Schellnhuber

1 Corona crisis: what can we learn? II

(1) The role of computer science:
– **Modelling**
(a) the **natural dynamics** of the pandemic (exponential growth)
(b) under the condition of **human intervention** (restrictive physical contacts)
(c) to describe **possible future scenarios**.
Thus, a scientific basis for the societal strategy to cope with the pandemic shall be provided. The best strategy to avoid tipping points seems to be starving out the virus*. Otherwise countries suffer still from recurrent waves.
– **Digitalisation of health data** allows to learn more about the disease, to better feed simulations, but also to guide the logistics of vaccination campaigns (which represent an "end-of-the-pipe" tech though).
– **"Infodemic" in social media.**** Viral disinformation on current diseases.

* #ZeroCovid, ** WHO

(2) The role of society:
– **More than the sum of individuals.** The resilience of a single individual in a pandemic can be increased by vaccination. Given that the vaccination interrupts the transmission of the virus, it is not required to vaccinate each individual in order to increase the resilience of the whole population of a society. Achieving a specific vaccination rate far below 100 % suffices (so-called herd immunity).
– **World society.** Given international integration, rich countries that reserved the bulk of vaccines, while poor countries can't afford them, can't control the pandemic, as long as immunisation strategies leave them out.
– **Colonisation of the wild.** The root cause of virus diseases is the extension of human extractivism into wildlife habitats.

(3) The role of ethics:
Individual freedom and **social order** harmonise, if freedom means opting rationally for **the common good** and not for one's own advantage.
– A pandemic is a state of **emergency**. If, in such a state, **individual responsibility** ("Eigenverantwortung") focuses on **particular interests only** instead on the **general interest too**, the strategy of governments to execute the general interest is obstructed, turning out **"too less, too late"**. The more obstruction, the **more fatalities** need to be accepted, which is **immoral**.
– A responsible behaviour would abide by the **precautious principle*** to avoid the worst case – the transgression of unknown tipping points.
– There is an imperative for **transcending myopic interests to eliminate the root cause**.

* Hans Jonas

Conclusion:
- *Computer science* provides **tools** for information processes.
- *Society* disposes of manyfold **information processes** that can be supported by such tools for good or bad.
- *Ethics* is a reflection on what is **good** and what is **bad**.

Responsible citizens take care to make sure that providing tools for information processes serve the common good, aiming at dismantling disastrous tipping points.

The post-Corona "new normal" must differ from the "old normal".

2 What is next? I

There are **existential risks for humanity**.

2.1 The "Atomic Age" I

2.1 The "Atomic Age" II

- 6 and 9 August 1945: Atomic bombing of **Hiroshima and Nagasaki**.

  Computer science: In the "Manhattan Project" – the first "Big Science" endeavour of building the bomb – women were used as **human computers** to calculate equations. They got support from IBM (International Business Machines) electric calculation machines to figure out the hydrodynamics of implosions and explosions.*
  After the focus turned from developing atomic weapons to improving them, LANL (Los Alamos National Laboratory) borrowed time on ENIAC (Electronic Numeric Integrator And Computer), the first **Turing-complete electronic computer** originally built for the US army to compute ballistic tables.**

* Atomic Heritage Foundation, ** LANL

2.1 The "Atomic Age" III

- 1950s: During the **Korean War**, the Harry S. Truman administration considered several times the use of nuclear weapons against China. As there was a mutual assistance pact between China and the Soviet Union, the US would have reached a tipping point past which a Third World War would have been started. The US possessed at least 450 bombs and the Soviet Union only 25*.

  Computer science: Famous US Army General, Douglas MacArthur, who wanted to deploy atomic bombs was removed from command in 1951. An **"electric brain"** is said to have opted against his approach.**

* Bruce Cumings, ** Günther Anders (p. 58)

2.1 The "Atomic Age" IV

- 1960s: MAD (Mutual Assured Destruction) implied nuclear **retaliation** capability. The ABM (Anti-Ballistic Missiles) Treaty between the US and the Soviet Union limited ABMs in order to save the retaliatory strike option for each side. In doing so, the intentional approaching of a tipping point was made more difficult.

2.1 The "Atomic Age" V

- 1980s: NATO deployed 108 Pershing **II** missiles and 464 Ground Launched Cruise Missiles in Western Europe. The US tried to gain a **first strike** capability through "decapitation" – in a pre-emptive nuclear strike, the ability of the Soviet Union to retaliate should be denied (military and political structures). A tipping point would be reached due to an extremely short advance warning time for the Soviet Union. Nuclear wars could allegedly be fought and won in Europe below the threshold of an all-out war.

Computer science:
– Provided the technological basis for **high-precision surgical** strikes.
– "**Nuclear Winter**" simulations didn't prove acceptable outcomes of wars.

2.1 The "Atomic Age" VI

- 1990s: The **Gulf War** liberated Kuwait by a US-led coalition of 39 countries.

  Computer science: The greatest **communication infrastructure initiative** in the history of mankind.
  – C4I (Command, Control, Communication, Computers, and Intelligence) became integrated for **Information Warfare**. Computer support allowed the decentralisation of the military organisation. Mission orders delegated responsibility down along the chain of command.*
  – The world public was (1) before the war prepared with a pro-war campaign and (2) during war targeted with live news broadcasts including fakes (e.g., the incubator testimony) – a "**Video Game War**". Both activities were set to establish a readiness for going to war, thus belittling tipping points.

* Wolfgang Hofkirchner, 205-239

2.1 The "Atomic Age" VII

- Also 1990s: **NATO against the Federal Republic of Yugoslavia** 1994/95 and 1999 – war in Europe.

  Computer science: The **Public Relations** industry – using appropriate information technology, today outperforming the Media industry in economic terms – began to replace evidence-based professional journalism by offering information tailored by private P.R. firms for their own partisan agenda (e.g., the training of UÇK – The Kosovo Liberation Army –, that committed war crimes too, for media performances satisfying western taste).* Another, privatised way of constructing tipping points.

* Jörg Becker/Mira Beham

2.1 The "Atomic Age" VIII

- After 2000: **Iraq War** and else.

  Computer science: "Embedded" journalists in the troops, worked close to the military. Western funded **"White Helmets"** organisation in Syria worked with islamist groups for propaganda.

2.1 The "Atomic Age" IX

- Nowadays: A **New Cold War** against Russia, China, Iran, …, and the **Battlefield of the Future**.

  Computer science:
  – Entertaining of organisations through military and secret services of US, NATO, EU member states and UK to officially counter so-called Russian disinformation, thus building up new **hostile images** instead of searching peaceful conflict transformation and deconstruct tipping points.*
  – **Autonomisation** of weapon systems (e.g., drones). Algorithms in high-frequency trading at the stock exchange can in milliseconds wind each other up such that a flash crash results. An escalation with nuclear weapons could cross the tipping point and lead into perdition.

* Jens Berger

2.1 The "Atomic Age" X

- **Conclusion:**
  *It's a miracle that neither insane intents nor unintended happenstances have so far led to the suicide of the human species, thereby disrupting the habitat for many other life forms on Earth too. The **tipping point** was not (yet) reached.*

  There is a lack of proper public attention to controlling of the arms race.

  *Who is it that poses the **counterforce** against that brinkmanship?*

2.1 The "Atomic Age" X

*It is the new **peace movement** that has been formed by civil society:*

*In 1955, the **Russell-Einstein Manifesto** laid the foundation for the Pugwash Conferences and other initiatives.*

The Russell-Einstein Manifesto

Bertrand Russell and Albert Einstein—
London July 9, 1955

Excerpts from the Manifesto -

IN the tragic situation which confronts humanity, we feel that scientists should assemble in conference to appraise the perils that have arisen as a result of the development of weapons of mass destruction, and to discuss a resolution in the spirit of the appended draft.
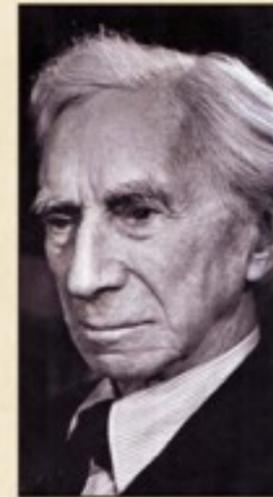
We are speaking on this occasion, not as members of this or that nation, continent, or creed, but as human beings, members of the species Man, whose continued existence is in doubt. The world is full of conflicts; and, overshadowing all minor conflicts, the titanic struggle between Communism and anti-Communism.

Almost everybody who is politically conscious has strong feelings about one or more of these issues; but we want you, if you can, to set aside such feelings and consider yourselves only as members of a biological species which has had a remarkable history, and whose disappearance none of us can desire.

We shall try to say no single word which should appeal to one group rather than to another. All, equally, are in peril, and, if the peril is understood, there is hope that they may collectively avert it.
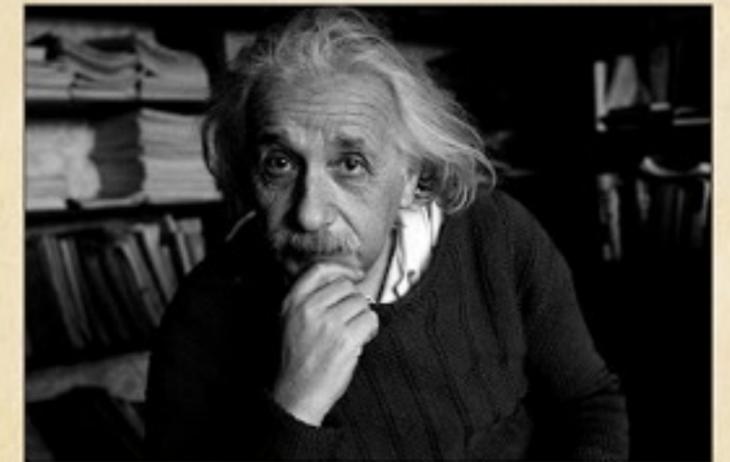
We have to learn to think in a new way.

2.1 The "Atomic Age" XI

*Any arms control agreement, any UN measure and any civil society initiative in that field – focusing not only on weapons of mass destruction but also on conflicts – is a step to **impede the drift towards a tipping point.***

*An example of how progress can be achieved is the **Treaty on the Prohibition of Nuclear Weapons (TPNW).** **

* ican austria

ican austria
Kampagne zur Abschaffung von Nuklearwaffen

ÜBER ICAN   MITMACHEN   NUKLEARWAFFEN   VERBOTSVERTRAG   PRESSE   KONTAKT

## Wer wir sind

ICAN Austria ist der österreichische Zweig der International Campaign to Abolish Nuclear Weapons (ICAN) und damit Mitglied eines globalen Zusammenschlusses von über 460 Organisationen in über 100 Ländern. Dieses internationale Bündnis wurde 2017 mit dem Friedensnobelpreis ausgezeichnet.

Globale Durchschnittstemperatur
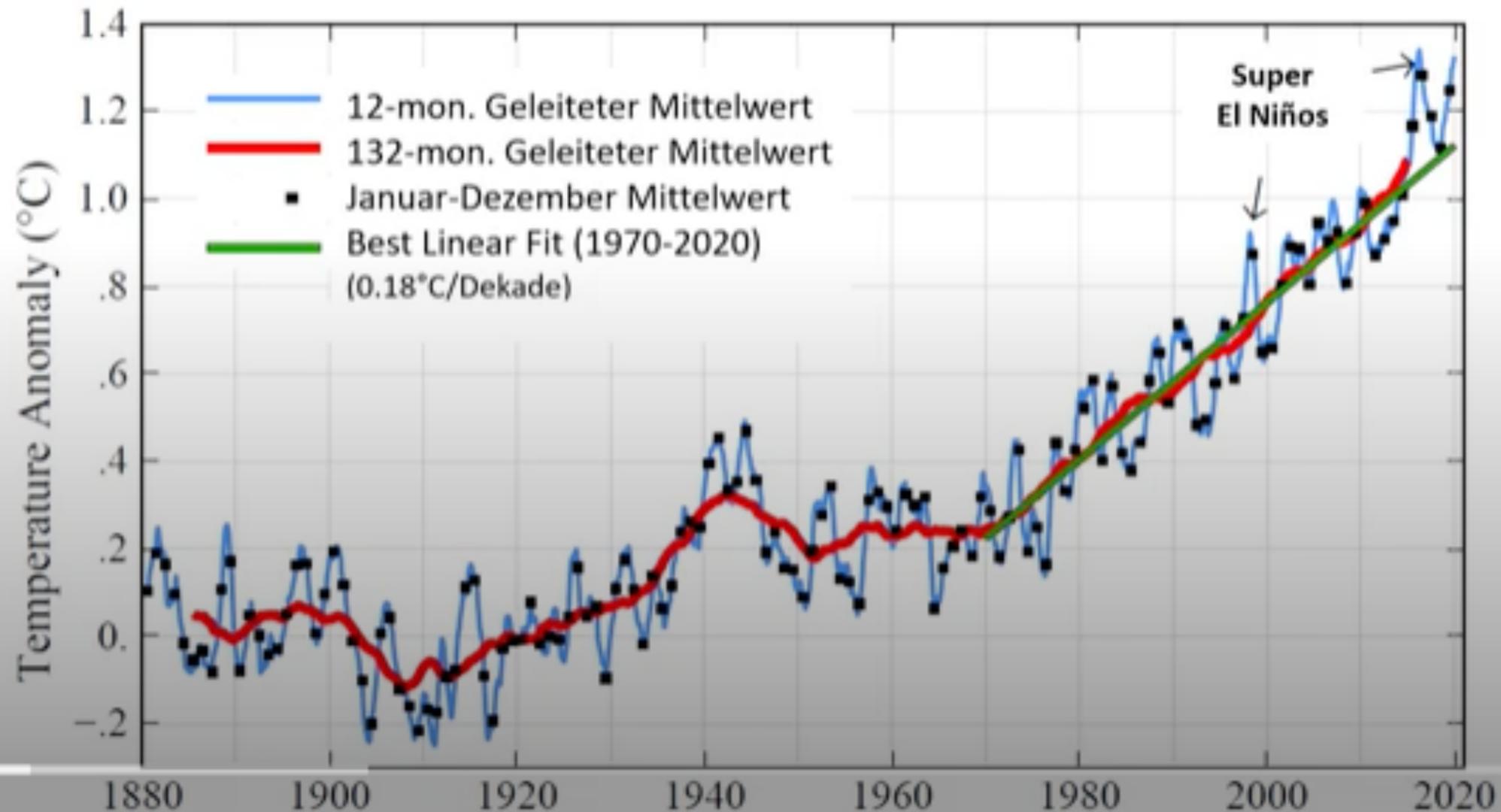
* Hans Joachim Schellnhuber

*Risiken am Horizont: Kippelemente im Erdsystem*
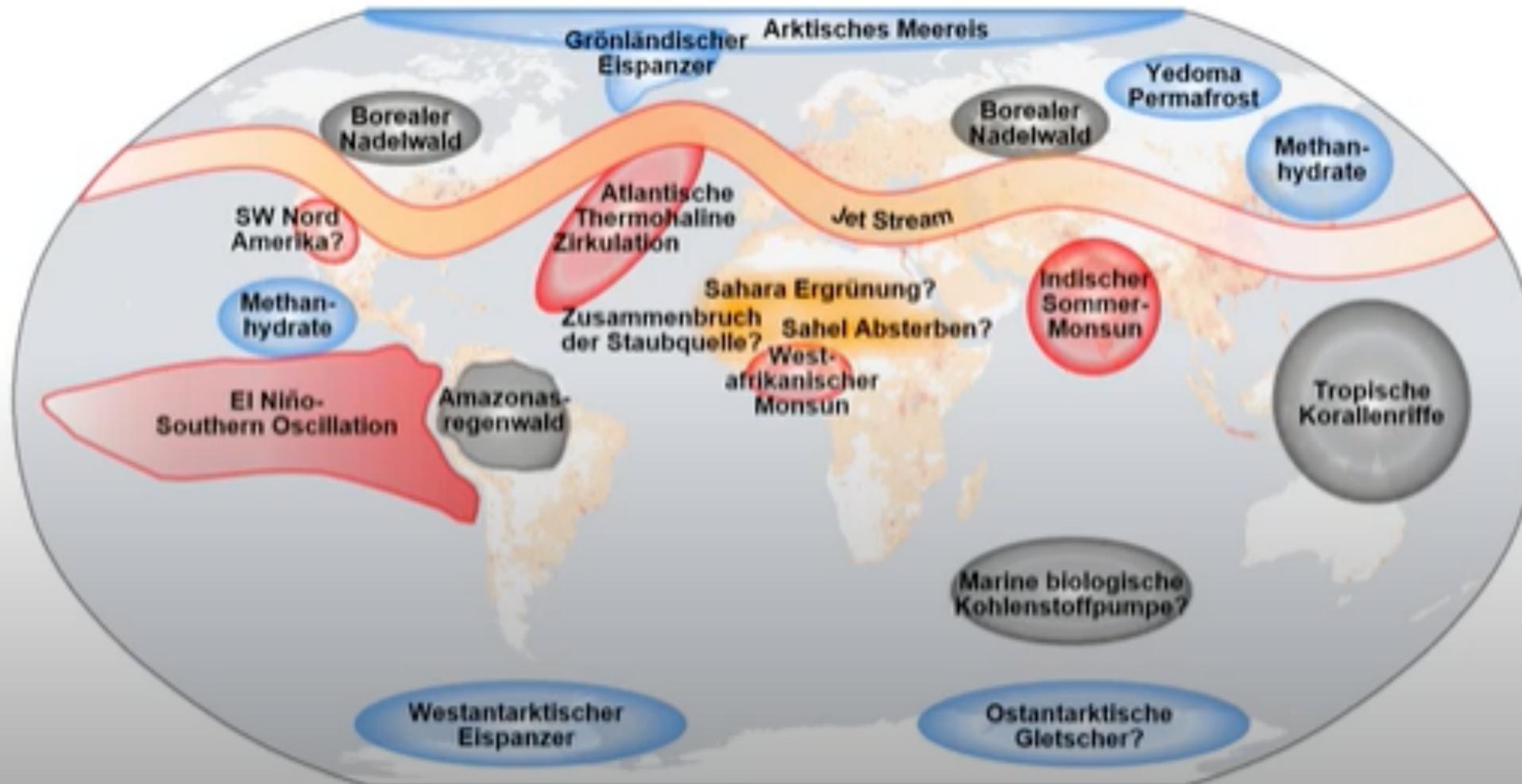
* Hans Joachim Schellnhuber

Kipp-Punkte relativ zur 2°C-Leitplanke
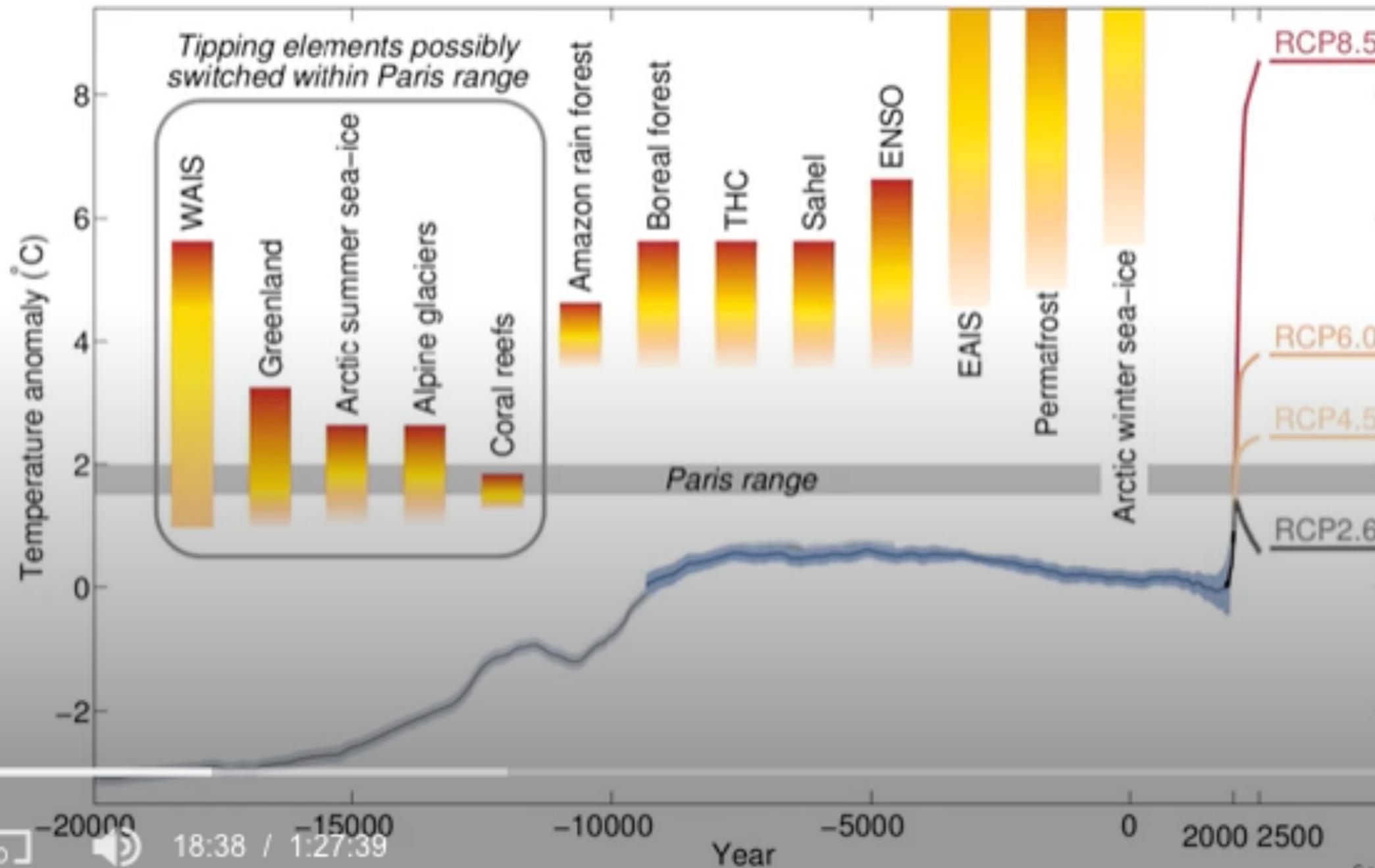
2.2 Climate change IV

- **Conclusion:**
  *It's a broad consensus among scientists that planet Earth gets heated. It depends on politics and its influence on economy, whether **tipping points** – which are irreversible – will be completely avoided or reached sooner or later.*
  To make it even more complicated and complex, the tipping points inherent in the development of the climate intertwine with tipping points in other fields of ecology.

  *Who is it that poses the **counterforce** against that brinkmanship?*

2.2 Climate change V

*It is the **environmental movement** that has been formed by civil society:*

*In 1962, US biologist **Rachel Carson** published her book **"Silent Spring"** on the impact of herbicides and pesticides like DDT through contamination of water and soil along the food chain on mammals and birds.*
She dedicated the book to Albert Schweitzer who had warned against nuclear weapons.

* Rachel Carson
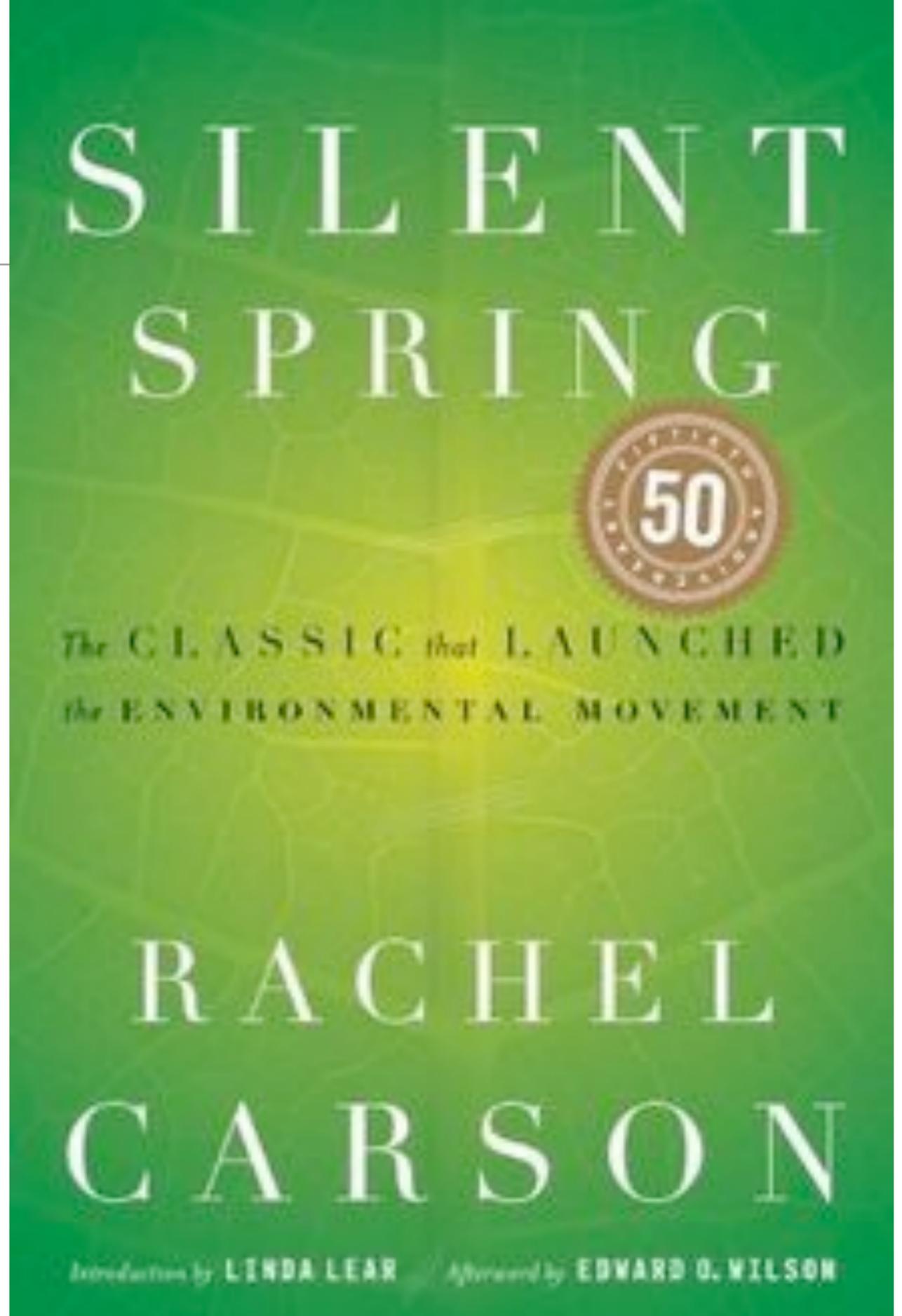
2.2 Climate change VI

*Any greening of politics and economy, claimed by civil society, is a step to **impede the drift towards any ecological tipping point**.*

*Still opposed, the urgency of activities is as huge as in the field of the Atomic Age: **Worldwide Climate Strike.***

* Fridays for Future

2.3 The imperial mode of production and living I

- **OXFAM International** report 2021 **"The Inequality Virus"**

THE VIRUS HAS HIT AN ALREADY PROFOUNDLY UNEQUAL WORLD

The coronavirus crisis has swept across a world that was already extremely unequal. A world where a tiny group of over 2,000 billionaires had more wealth than they could spend in a thousand lifetimes. A world where nearly half of humanity was forced to scrape by on less than $5.50 a day.[14] A world where, for 40 years, the richest 1% have earned more than double the income of the bottom half of the global population.[15] A world where the richest 1% have consumed twice as much carbon as the bottom 50% for the last quarter of a century, driving climate destruction.[16] A world where the growing gap between rich and poor both built on and exacerbated age-old inequalities of gender[17] and race.[18]

THE CORONAVIRUS CRISIS HAS SWEPT ACROSS A WORLD THAT WAS ALREADY EXTREMELY UNEQUAL.

* OXFAM

2.3 The imperial mode of production and living II
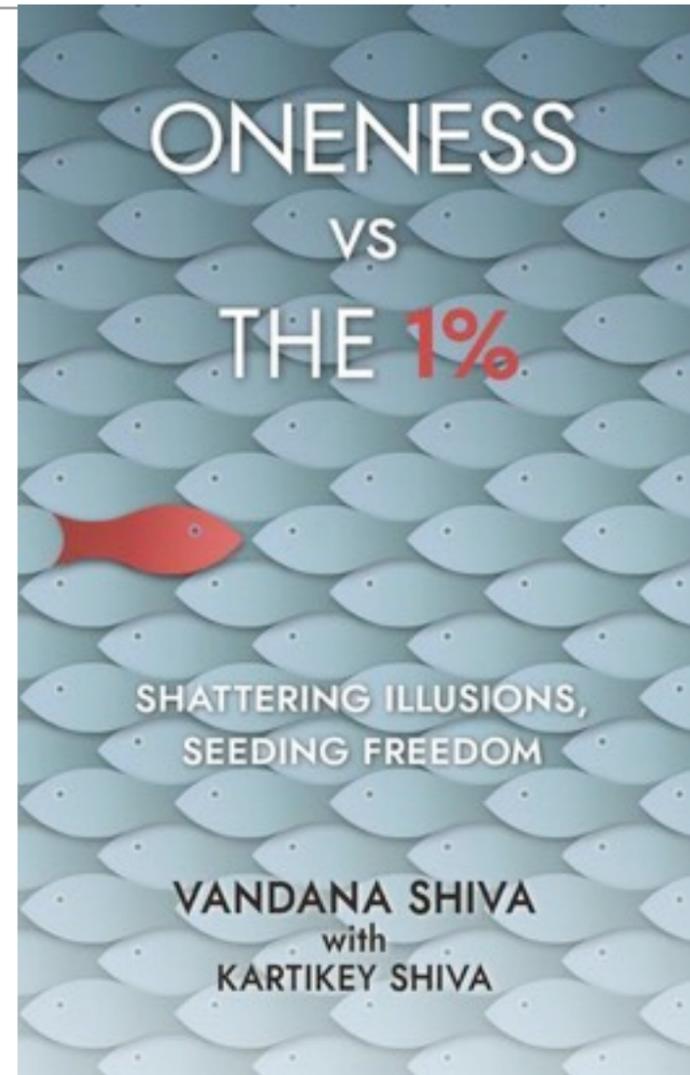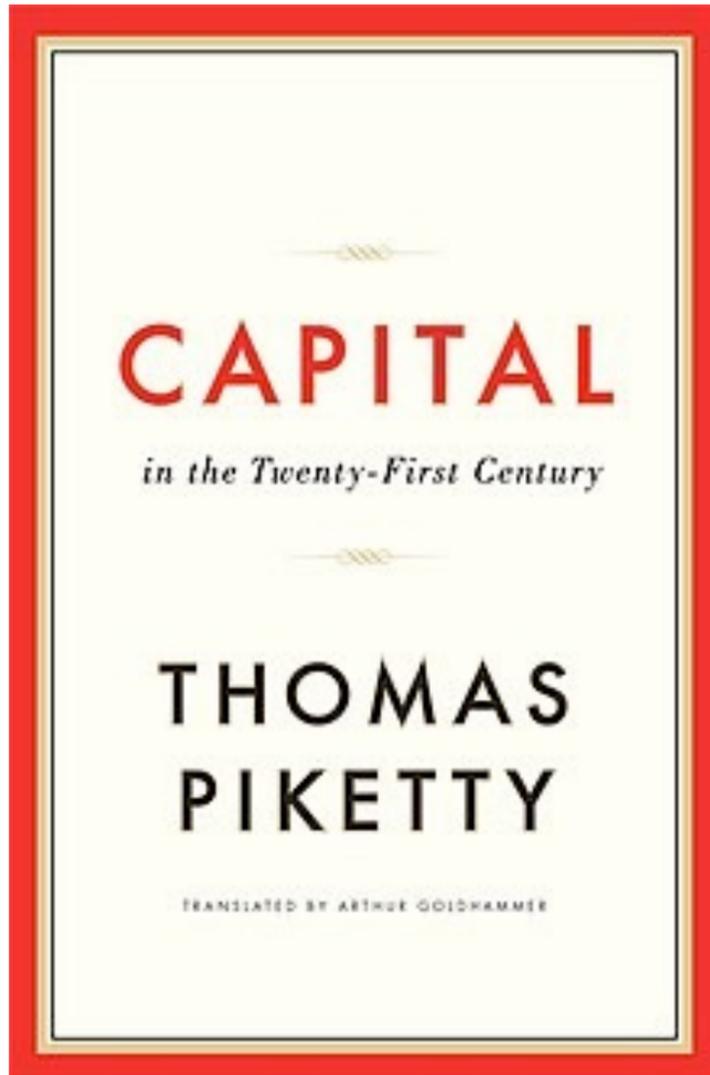
- French economist **Thomas Piketty** theorises in 2014 that **wealth and income inequality in Europe and the US** tends to enlarge. In history, relief and wars go hand in hand.*

- Vandana Shiva says in 2019, the **global corporations** of **1% of the world population** cause poverty, malnutrition, and a refugee crisis.**

* Thomas Piketty, ** Vandana Shiva

2.3 The imperial mode of production and living III
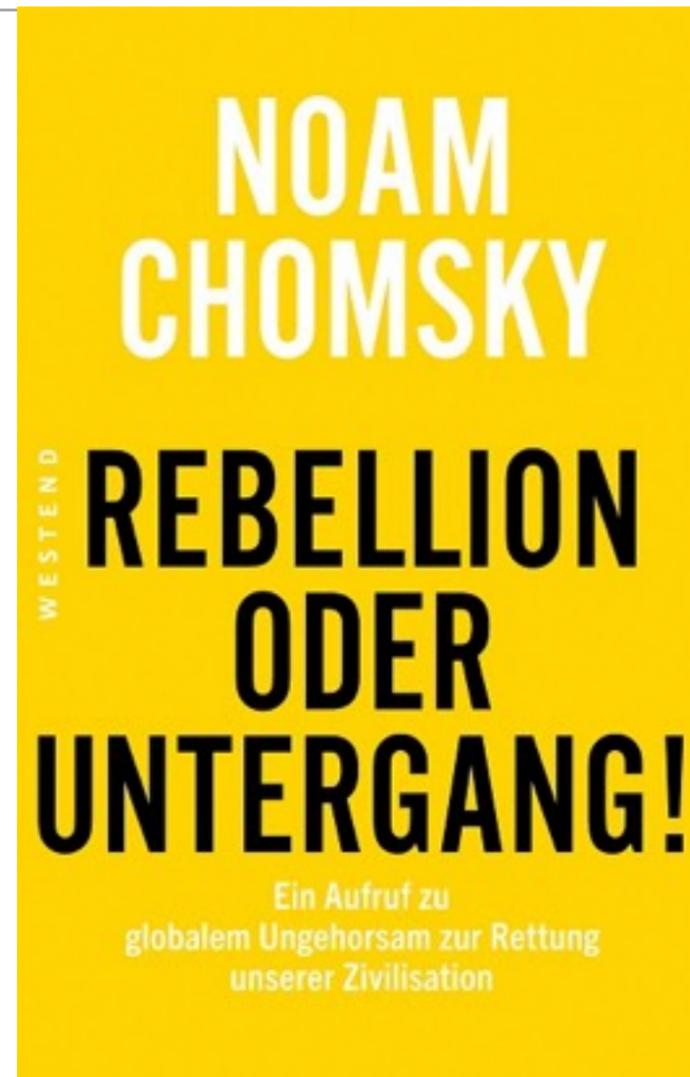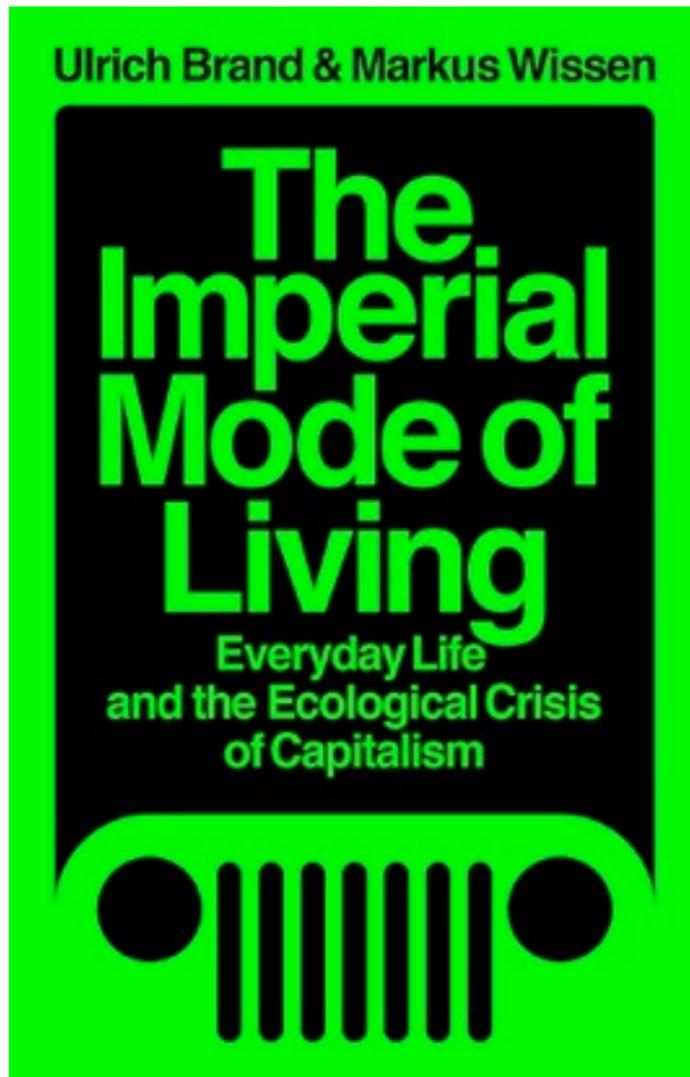
- One part of humanity is producing and living **at the cost of another part**, and in doing so, **at the cost of the natural living conditions**.*

- In addition, **Noam Chomsky** warns against a worldwide **right-wing drift** towards "Our country first!"-slogans – they destabilise democracies like in the 1930s.**

* Ulrich Brand/Markus Wissen, ** Noam Chomsky

2.3 The imperial mode of production and living IV

- **Conclusion:**
  Tipping points *are imminent, as long as justice is denied to parts within societies as well as to societies in the nascent world society – tipping points the transgression of which could entail unnecessary bloody social upheavals resulting in wars, in devastation of the natural conditions of human civilisation, and even in extinction.*

  Who is it that poses the **counterforce** *against that brinkmanship?*

2.3 The imperial mode of production and living V

*It is what originally was called
the **solidarity movement**:*

*In 1963, psychiatrist **Frantz Fanon**'s book
on colonialism was released in English
under the title **"The wretched of the Earth"**.
It prompted movements that in the metropoles
showed solidarity with the anti-colonial liberation
movements of the South.
They have been diversifying into a
multitude of initiatives.*

* Frantz Fanon
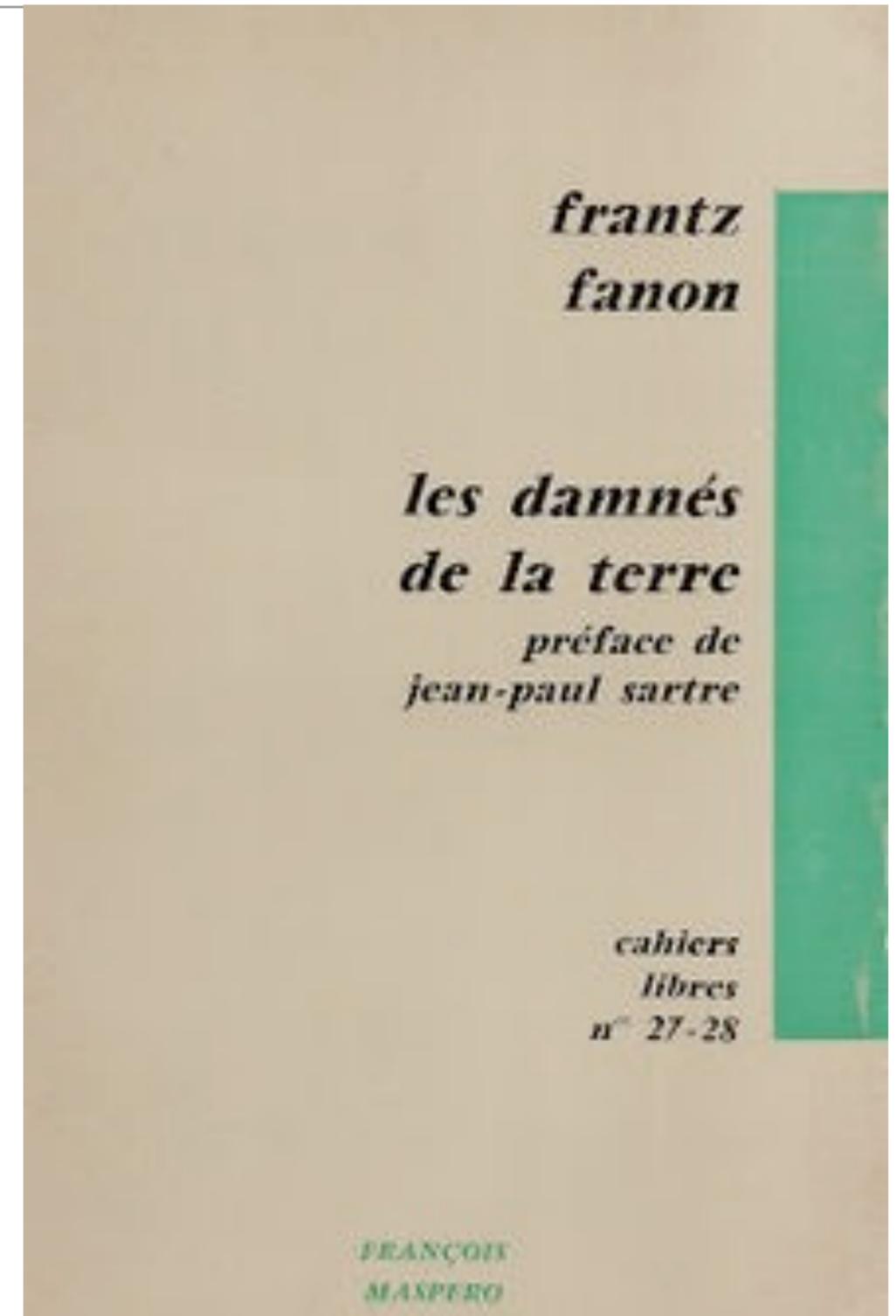
2.3 The imperial mode of production and living VI

*Any civil society attempt to mitigate the crises originating from social inequality means to **deconstruct tipping points**. The imperial mode of production and living is the root cause of climate change and "Atomic Age".*

*Among initiatives in different fields, the **Economy for the Common Good** is an initiative of businesses to transform economy for people and planet.*

ECG Associations   ECG Local Chapters   ECG Companies

* Economy for the Common Good

2 What is next? II

Conclusion:

There are existential risks for humanity made by humans – all of them can be mastered if humanity is wise enough to tackle with tipping points.

However, some tipping points might already have been crossed.

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Reflections on Computer Science, Society and Ethics 1
Computer Science II:
Meaningful designs

Wolfgang Hofkirchner
IMC Krems, 16 March 2021

Contents

1 Ethically aligned design I

Whenever we design technology, we take over **responsibility**, willingly or not, in two different respects:

(1) We take over responsibility for the **functionality** of the device:

Does the mechanism implemented effectively lead to the end for which technology shall be designed, that is, is it **functional**?
This is a **matter of fact**. This is the **engineering perspective**.

1 Ethically aligned design II

(2) At the same time, we take over responsibility for the **meaningfulness** of the device:

Does the end for which technology shall be designed **really make sense**, that is, is it **good**, is it **a justifiable purpose**?
This is a **matter of values**. This is an **ethical perspective**.

We need to **complement** the engineering perspective with an ethical perspective. If the design is functional, it is in vain, unless it is for a good purpose. The good purpose only gives meaning to devising the best functions.

2 Information and Communciation Technologies (ICTs) supporting cognition – communication – co-operation I

ICTs support human information processes. Information processes turn up as generation of information during
– **cognition** (1 person reflects her external or internal environment),
or during
– **communication** (at least 2 persons engage in sending and receiving messages),
or during
– **co-operation** (as a rule, more than 2 persons engage in acting towards a common goal).

2.1 Disruption of thought I

|	postulated technologies	prevailing trends in effect: *homo informaticus*
technically supported cognitive functions	**"tools for thought"***	**mechanisation** of intelligence: • **algorithmisation of creativity** – loss of human capacity to make generalisations and to deal with levels of abstraction due to alignment with machine processing relying on formal logics and mathematics only (e.g., big data) • **dataism** – neoliberal craze for measuring everything (e.g., quantification of body performance self-optimisation strategies)

* J.C.R. Licklider, Doug Engelbart et al.

2.1 Disruption of thought II

	postulated technologies	prevailing trends in effect: *homo informaticus*
technically supported cognitive functions	**"tools for thought"***	• **outsourcing of thinking to machines** to which erronously a full-spectrum superiority is attributed (e.g., "autonomous" and "intelligent" "systems") • **outsourcing of knowledge to the web** – algorithms work according to the power law (Matthew principle: "the rich get richer and the poor get poorer") and reinforce existing biases (e.g., white supremacy, gender inequality, antisemitism)

* J.C.R. Licklider, Doug Engelbart et al.

2.1 Disruption of thought III
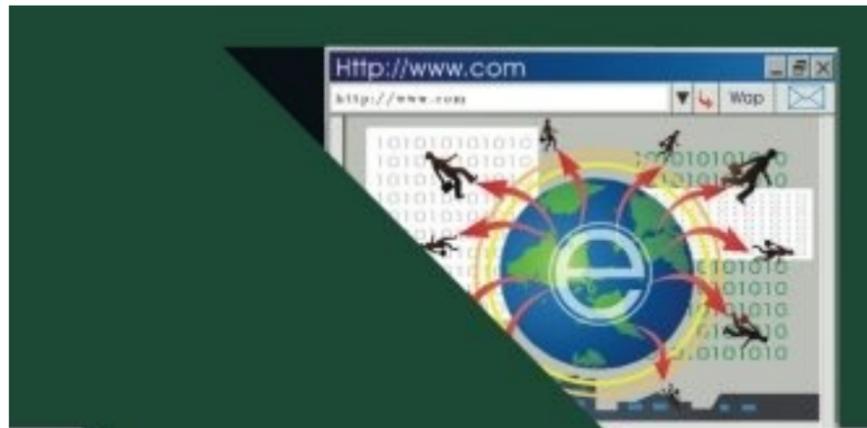
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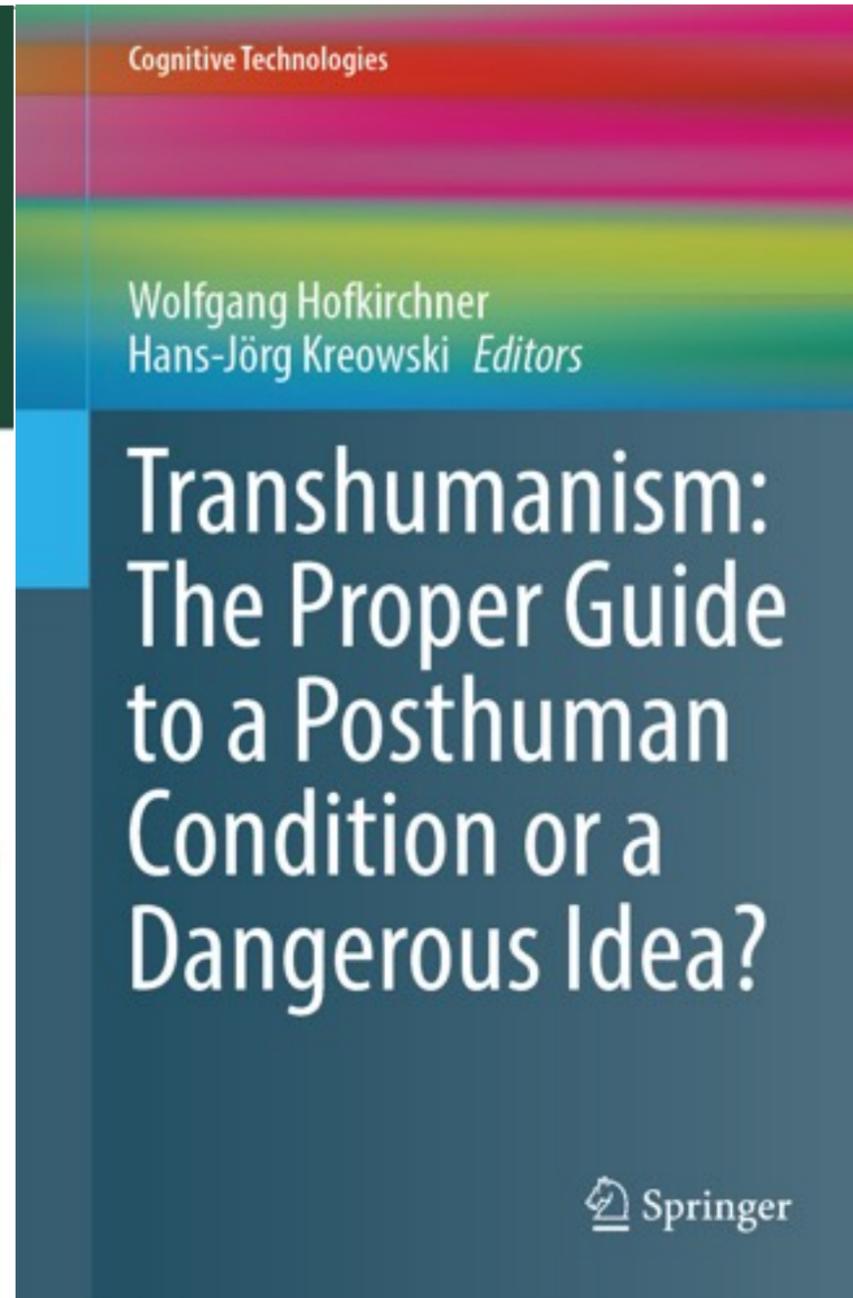
Cognitive Technologies

Wolfgang Hofkirchner
Hans-Jörg Kreowski *Editors*

**Transhumanism:
The Proper Guide
to a Posthuman
Condition or a
Dangerous Idea?**

Springer

2.2 Disruption of mutual understanding I

|	**postulated technologies**	**prevailing trends in effect:** *homo demens*
technically supported communicative functions	"media"*	**disinfotainment**** in a divided society: • **attendance economy*****, **the society of the spectacle**° – struggle to voice oneself (e.g., sensationalism, scandalisation, rising irritability°°) • **disinformation overflow** – manipulation and propaganda produced by the powerful in economy, politics and media (e.g., think tanks and gate keepers close to elites°°°)

* Sybille Krämer, ** Howard Rheingold, *** Georg Franck, ° Guy Debord, °° Bernhard Pörksen,
°°° Uwe Krüger

2.2 Disruption of mutual understanding II

	postulated technologies	**prevailing trends in effect:** *homo demens*
technically supported communicative functions	"media"*	• **"post-truth age"** – loss of capacity to discern facts and fiction (e.g., in particular, on social media, science denialism, both-sidesism, conspiracy theories, filter bubbles, hate posts, bots), loss of trust • **virtual escapism** – loss of sense of reality through new means of distraction (e.g., unserious gaming, computer addiction, booming consumerism)

* Sybille Krämer

2.2 Disruption of mutual understanding III
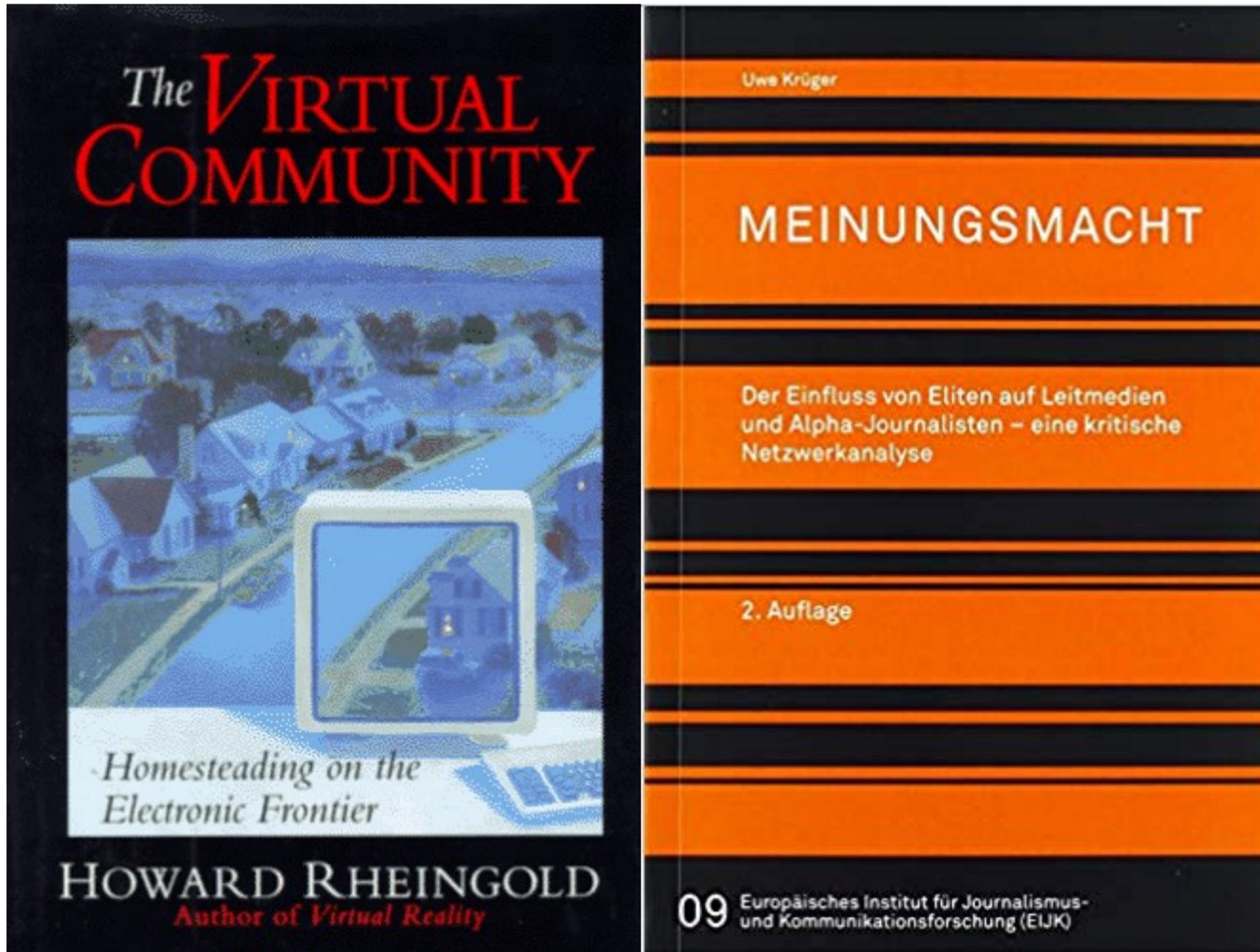
2.3 Disruption of conviviality I

|	postulated technologies	prevailing trends in effect: *homo idioticus*
technically supported co-operative functions	**"technologies of co-operation"***, **"tools for conviviality"****	replacement of the military-industrial complex*** by the **military-informational complex** (e.g., Big Five/GAFAM & NSA)***: • **surveillance capitalism**° – exploitation of work of social media users as involuntary producers of personal data for the purpose of behaviour control as dominant business model • **surveillance state** – control of citizens apparently for no reason

* Howard Rheingold, ** Ivan Illich, *** Dwight D. Eisenhower, ° Shoshana Zuboff

2.3 Disruption of conviviality II

	postulated technologies	prevailing trends in effect: *homo idioticus*
technically supported co-operative functions	**"technologies of co-operation"***, **"tools for conviviality"****	• **cyber/information warfare** (state/private) • **job rationalisation** – robots, cyberphysical systems (e.g., "digitalisation", "Industrie 4.0") • **platform capitalism** – so-called "sharing economies" for profit instead of organisations for the common good (e.g., Uber, Airbnb) • **trans-/posthumanism** – antihumanist ideologies disorienting technological progress ("*homo deus*", "*techno sapiens*") • **producing things we do not need either**

* Howard Rheingold, ** Ivan Illich

2.3 Disruption of conviviality III
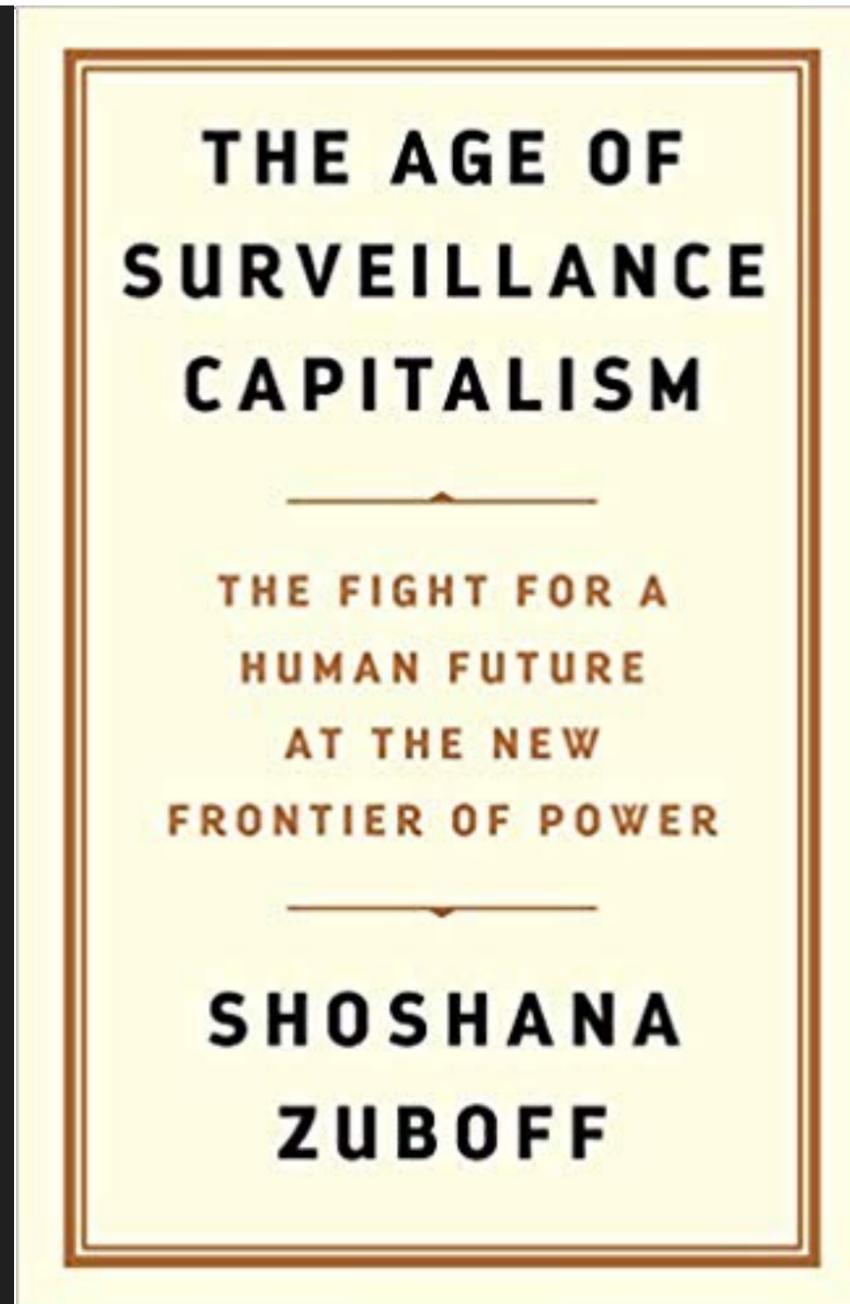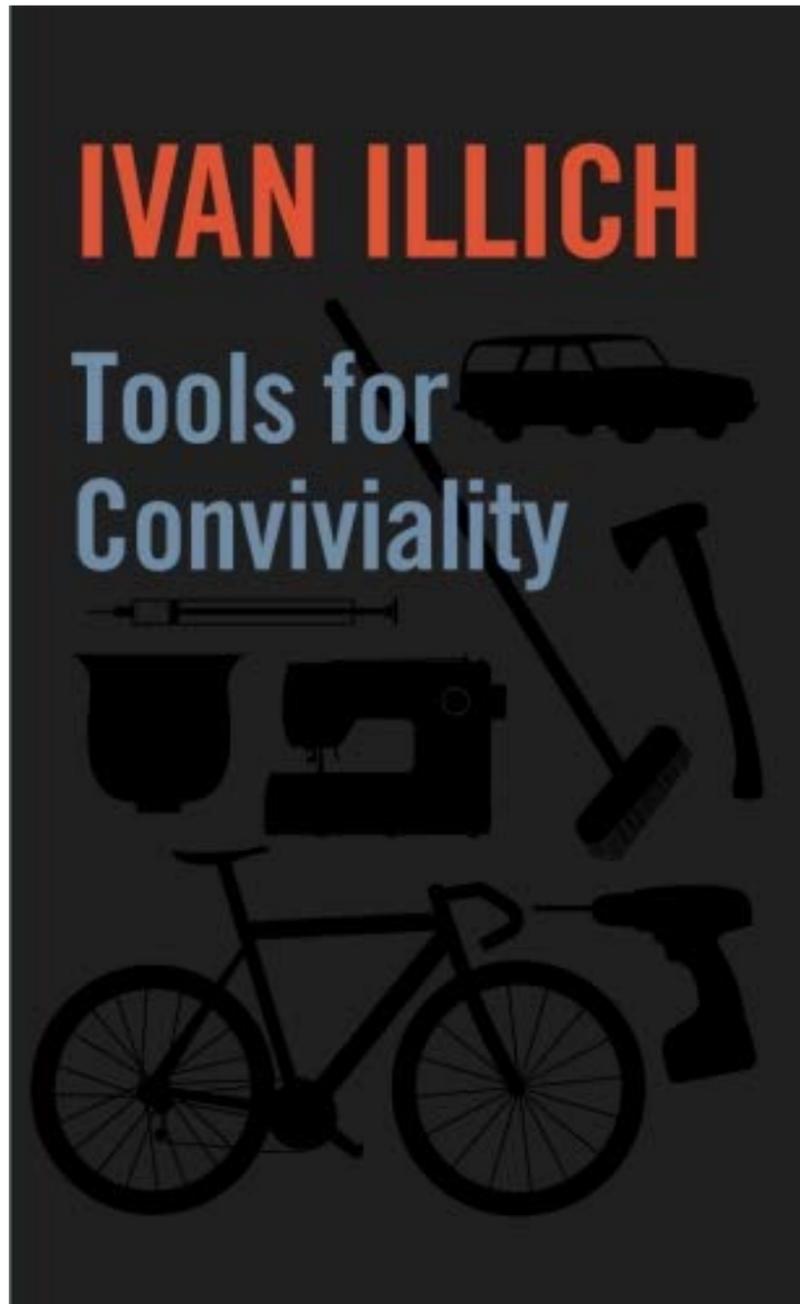
2 Information and Communciation Technologies (ICTs) supporting cognition – communication – co-operation II

- **Conclusion:**
  Since the positive potential of ICTs promised a better future, computer scientists and the public unanimously longed for it.
  However, in effect, trends prevail nowadays that do not harness their potential for good, but even risk the survival of mankind.

  *Who is it that poses the **counterforce** against that brinkmanship?*

It is a computer science that questions the purpose for which ICTs are designed and claims for **ethically aligned ICTs***.*

Computer pioneer **Joseph Weizenbaum** *is a role model for such a kind of science.**

The **Forum Computer Scientists and IT Professionals for Peace and Social Responsibility (FIfF)** *is a German association in that field.****

* Plug&pray, ** FIfF

„DAFÜR WERDEN WIR ALLE EXKOMMUNIZERT."

PLUG &PRAY

EIN FILM VON JENS SCHANZE

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