

Will Steffen (Chief Scientist IGBP) The Evolution of the Anthropocene From Hunter-Gatherers to a Global Geophysical Force – Bureau of Rural Sciences in Canberra, Australia

“It is not hard science but rather introduction to the new ideas ☺”

Will Steffen – Peyresq, 2005

As you can all go through the presentation I am highlighting only the points that are not apparent from the slides....however I have certainly missed a lot for which I apologize,

The term **Anthropocene** describe an epoch during which humans became geophysical force. However it covers only last 5% of our time at the planet. As this era deserves thorough examination the project IHOPE – Integrated History and Future of People on Earth – has been recently started. The objective of this project is to understand better interaction between human societies an their environment. The past from the perspective of human-environment systems rather than from the point of historically important dates and personalities. The project will as well devote time to testing of models on human-environment systems and use IHOPE date to populate databases.

Brief history of mankind evolution:

First migration out of Africa was in the cold period due to the low sea level – through the bottom of the Red Sea – 85 000 years ago by speed of few kilometers per year – ended up in the Australia. European migration came from South Asia in 50 and 35 000 years ago.....through the time there was no agriculture so just hunting and picking☺. “Few” thousand years later agriculture started (about 8 000 years ago) – in the near climatological optimum...

Anthropocene era division:

1) Pre-Anthropocene events:

- “fire-stick farming and use of the fire by early humans, burning of coal (limited) about 1000 years ago – deforestation....
- Fire-stick farming was to use to modify woodlands into savannas and grasslands and maintain ecosystems in those states.....
- Megafauna extinction – by hunting (the megafauna survived number of large swings but they disappeared few 1000 years after arrival of Aborigines)
- Rudimman’s theory - Clearing the forest lead to increase of the CO₂ and CH₄ concentration.. these changes prevented trend in greenhouse gas concentrations following the mid-Holocene peak - hypothesis has been widely debated (and rejected) within the C cycle/climate community.

Early civilizations collapse:

Akkadian and May’s civilization were pushed to the history by combination of internal weakness and outside pressure.

- Tainter-increasing complexity and decreasing resilience
- Friedman – waves of globalization to an upper limit of system compatibility (there are biophysical limits to the growth)
- Diamond – inflexibility of core societal values – Collapse – societies face the inflexibility of core societal values

- Scarborough (Maya): self-organization-networks of alliances and exchanges – adaptation to the dynamics of natural ecosystem – collapse due to the centralization of the power.
- 2) **Anthropocene Stage 1 (from 1800-1945):** Internal combustion engine, fossil fuel, energy, sci-tech
 - Evidence in GHG increase and widespread deforestation, Industrial revolution, and Increase in the production and ability to consume. Great acceleration after 1750. In 1950 there was Great Acceleration around 1950 in number of processes...
 - Origins of the technological development goes back around 1600 with the start of the modern scientific approach during Renaissance
 - Rise of technologies that support mass consumption, fossil fuel energy and Haber-Bosch nitrogen fixing were the main invention that enabled the rapid rate of development
 - Globalization theory-global network of communication and finances crossed a threshold of connectivity ...
 - Emergence of armies of scientist after WWII that were “free” for technological development.
 - Establishment Bretton-Woods institutions
- 3) **Anthropocene Stage 2 (1945-2020):** The Great Acceleration, new institution,...
 - What drives the great acceleration? Fossil fuels with rapid population growth
 - Large scientific research institution
 - US would like to start world economy based on capitalist neo-liberal economic principles
 - Increasing commodisation of public goods (e.g. ecosystem services)
 - Growth imperative – driven by including more people to consume more...
 - Hibbard 2005 – the population-consumption/production (loop) fueled by fossils and science (and knowledge)
 - Changing human environment: mixed environmental impacts – homogenization of the environment at the global level
 - Loss of diversity of cultural values – moving largely to the western view of the environment – e.g. Australia lost the view of Aborigines –
 - Negative environmental impacts of debt crisis
 - Urbanization and the environment: Difference in understanding nature – urban people are superior in “book” learning – vast difference between urban and rural dwellers.
 - Still increasing wealth, rising consumption and...expectations

Transformation of rural-urban linkages: *Tomato example – grown in Netherlands (green houses)- flew to Moscow-packed in Moscow-flew back to the Netherlands and sold in supermarkets...*

According Will sings of Deceleration (sings on the edge of the globalization trends) should become more apparent by 2010-2015 e.g. rapidly declining fertility, emergence of environmental governance and institutions, technological advantage e.g. decarbonisation of energy, education and awareness

4) **Anthropocene – Scene 3**

- Destructiveness of extreme events– with very different resilience of the society

Recommended literature:

- 1) Jared Diamonds: “Guns, germs, and steel” and “Collapse”
- 2) Tim Flannery: “The future eaters”
- 3) S. Oppenheimer, “Out of Africa” (2004) –

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