



UNIVERSITÀ
DEGLI STUDI
DI BERGAMO

LM - ACCOUNTING, GOVERNANCE AND SUSTAINABILITY

Challenges in a World in Transition

Academic year
2026-2027

Prof. Federica Burini
Prof. Vera Lomazzi

Articulation

From 15 September

First part

Geographical perspective



Prof. Federica Burini

1. 14 settembre 16:30-18:30 Burini
2. 16 settembre 12:30-14:30 Burini
3. 21 settembre 16:30-18:30 Lomazzi
4. 23 settembre 12:30-14:30 Lomazzi
5. 28 settembre 16:30-18:30 Burini
6. 30 settembre 12:30-14:30 Burini
7. 5 ottobre 16:30-18:30 Burini
8. 7 ottobre 12:30-14:30 Lomazzi
9. 12 ottobre 16:30-18:30 Lomazzi
10. 14 ottobre 12:30-14:30 Lomazzi
11. 19 ottobre 16:30-18:30 Burini
12. 26 ottobre 16:30-18:30 Burini
13. 28 ottobre 12:30-14:30 Burini
14. 3 novembre 16:30-18:30 Lomazzi
15. 4 novembre 12:30-14:30 Burini
16. 10 novembre 16:30-18:30 Burini
17. 11 novembre 12:30-14:30 Lomazzi
18. 17 novembre 16:30-18:30 Lomazzi
19. 18 novembre 12:30-14:30 Lomazzi
20. 24 novembre 16:30-18:30 Lomazzi
21. 25 novembre 12:30-14:30 Lomazzi
22. 1 dicembre 16:30-18:30 Lomazzi
23. 2 dicembre 12:30-14:30 Lomazzi
24. 9 dicembre 12:30-14:30 Burini
25. 15 dicembre 16:30-18:30 Burini

Sociological perspective



Prof. Vera Lomazzi

Bibliographic references



Handbook on the Geopolitics of Sustainability



Edited by [Björn-Ola Linnér](#), [Therese Bennich](#), and [Henrik Carlsen](#)

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This Handbook brings together more than 60 leading researchers from diverse academic disciplines to examine the complex and evolving intersection between geopolitics and sustainability. The result is a timely exploration of how sustainability challenges reshape geopolitics and how geopolitics, in

[... Show More](#)

Keywords: [Geopolitics](#); [Sustainability Transformations](#); [Governance](#); [System Analysis](#); [Complexity](#); [Security](#); [Environmental Change](#)

+ *Inhabiting the world*, Michel Lussault

<https://www.pca-stream.com/en/explore/inhabiting-the-world/>

+ *Sustainability transitions in the developing world: Challenges of socio-technical transformations unfolding in contexts of poverty*, by Mónica Ramos-Mejía, Maria-Laura Franco-Garcia, Juan M. Jauregui-Becker, Department of Governance and Technology for Sustainability (CSTM), University of Twente, The Netherlands, Department of Design, Production and Management (OPM), University of Twente, The Netherlands (open access)

<https://research.utwente.nl/en/publications/sustainability-transitions-in-the-developing-world-challenges-of->



Topics covered during the lectures – first part

1

Prof. Federica Burini, Topic: *Course introduction*

2

Prof. Federica Burini Topic: *Basic concepts about the World from a geographical perspective*

3

Prof. Federica Burini Topic: *Geography and Urbanity in the Anthropocene*

4

Prof. Federica Burini Topic: *Reading the world in the process of Mondialization*

5

Prof. Federica Burini Topic: *Urbanity and territorial processes*

6

Prof. Federica Burini Topic: *Urbanities, by Jacques Lévy*

7

Prof. Federica Burini Topic: *Vulnerabilities of the contemporary world: environmental, social, economic, governance, digital*
Group work on Challenges in a World in Transition and spatial justice

8

Prof. Federica Burini Topic: *The configurations of spatial justice: place, environment, landscape justice*
Group work on Challenges in a World in Transition and spatial justice

9

Prof. Federica Burini Topic: *Methodologies for facing vulnerabilities and promoting landscape justice*
Group work on Challenges in a World in Transition and spatial justice

10

Prof. Federica Burini Topic: *Group work*

11

Prof. Federica Burini Topic: *Group work*

12

Prof. Federica Burini Topic: *Group work on Challenges in a World in Transition and spatial justice*
Final presentation and Course conclusions

Evaluation

Evaluation:

50% project work presentation

50% written exam →

1. general knowledge of the topics; 2. correct elaboration of concepts; 3. critical approach

GROUP WORK

Objective: to read multiscale-intersectional connections related to global challenges in a specific «territorial patch» and suggest an analysis on how to face them

Organisation: 4 groups, membership criteria (gender balance, nationalities, ...)

«TERRITORIAL PATCH»: territorial lab where to discover global/local connections to global challenges (environmental, social, economic/productive, governance)

Articulation of the presentation:

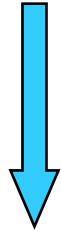
1. Introduction (reminding the title and explain your vision/position)
2. Territorial analysis of the chosen patch
4. Analysis of social actors involved in the patch
5. Global challenges and the perception of the landscape: pollution and mobility
6. Conclusion (summarise the problems and envisage solutions)

Self-evaluation

Monday December 15 10 minutes each group

Final discussion, Self-evaluation of the groups

GEOGRAPHY



Science for analysing

TERRITORY



SOCIETY

FOCUS in contemporary Geography:
critical approach to INHABITANTS/SPATIALITY-URBANITY

Brainstorming: Challenges / World / in Transition



*Basic concepts about the World from a
geographical perspective*

Challenges

- Environmental
- Social
- Economic
- Governance

→ URBANITY!!!



In transition

- Spatio-temporal perspective
- Human-non human relations
- Dynamic evolution
- Multiscale perspective
- Systemic approach



WORLD

- Earth
- Planet
- Globe
- World



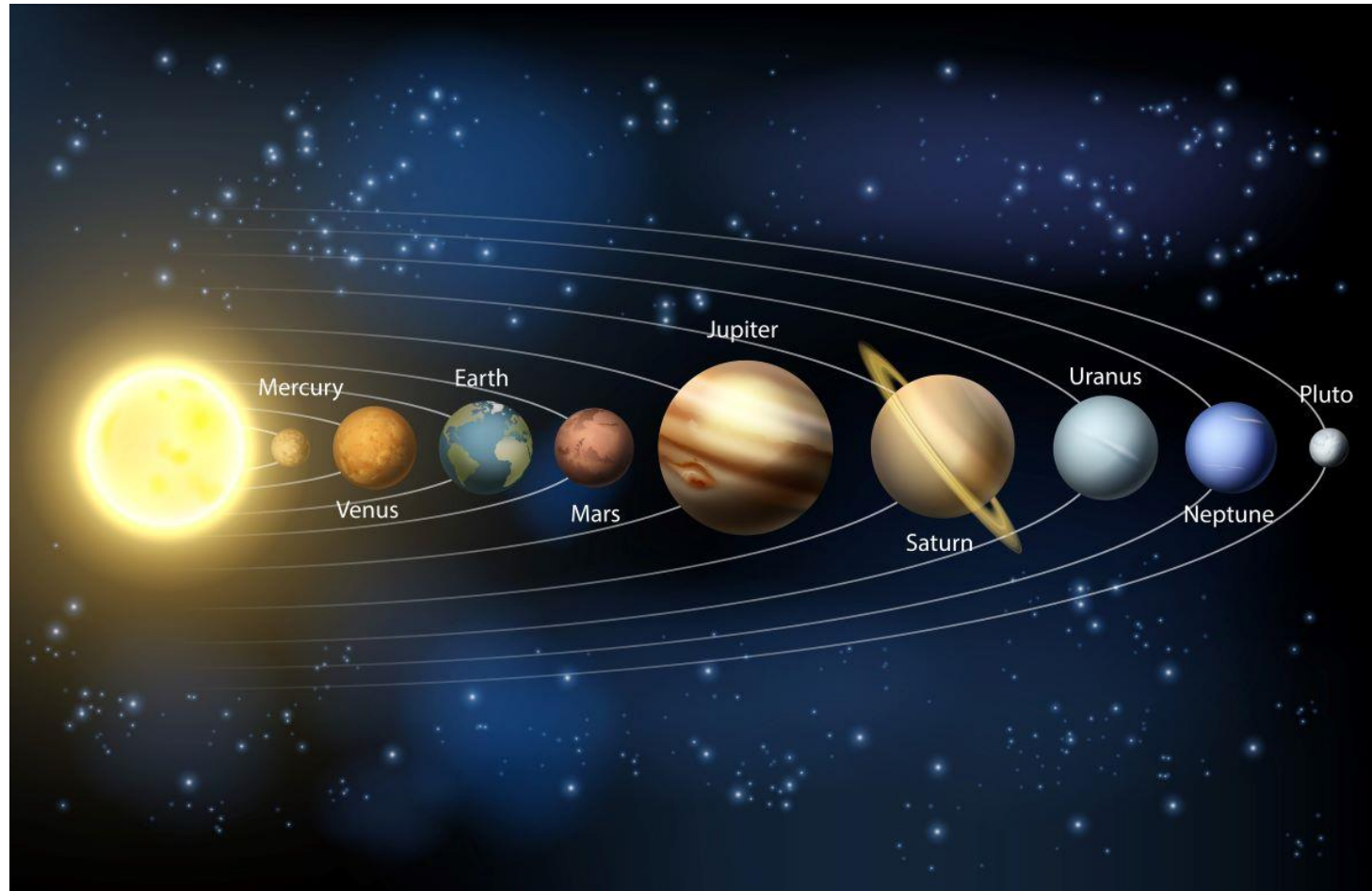
Earth

extension of land which gives life to human and non human beings



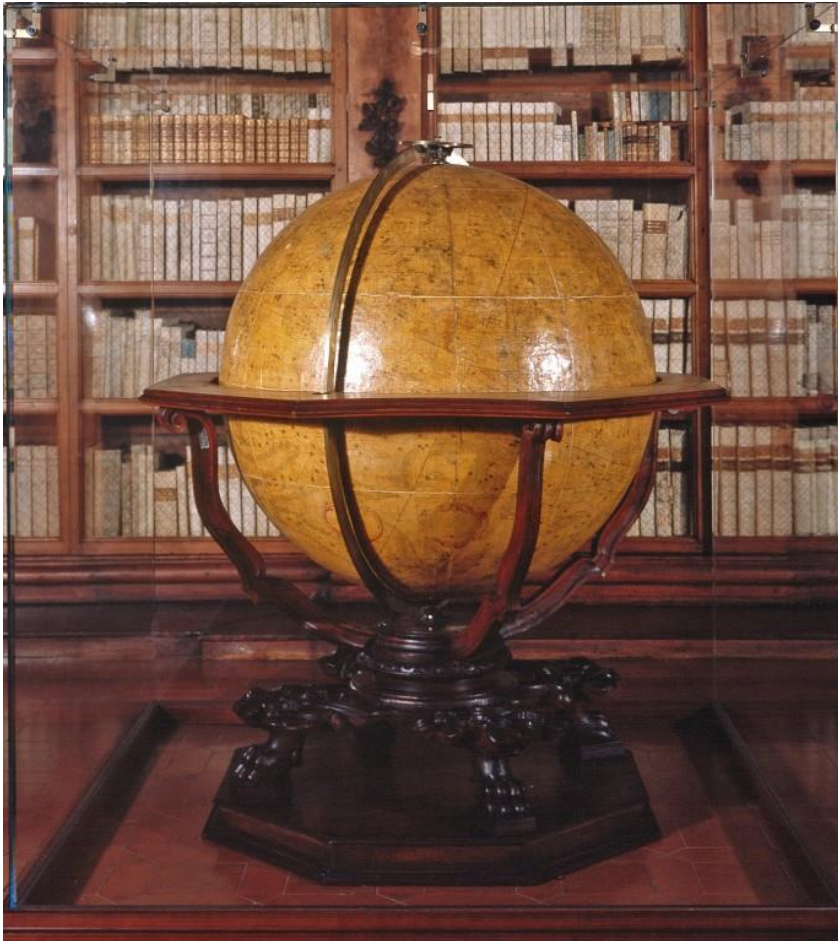
«The Planet»

celestial body which orbits around a star



The Globe

reproduction/representation of the Earth/Planet



Vincenzo Maria Coronelli, Globo
terracqueo, 1688
Biblioteca Mai, Piazza Vecchia,
Bergamo

The World

socially constructed social space at the global scale shaped by human activities



1968, first picture
of the Earth from
Apollo 8

- What is the **World**, in a geographical perspective? It's not the **Planet**, it's not the **earth**, but a (socially) constructed social- space at the global scale, historically shaped by human activities.
- Globalization = urbanization

	1900	1950	2000	2017	2050
<u>World population</u>	1,5 billions	2,6 Billions	6,1 billions	7,5 billions	at least 9,6 billions
<u>Urban Population</u>	220 millions	745 millions	2,8 billions	4 billions	at least 6,7 billions

-Planetary urbanization is not only a demographic phenomenon.

Urbanization is a kind of «revolution »

(cf. Henri Levebvre, *La révolution urbaine*, Paris, Gallimard 1971, trad. *La rivoluzione urbana*, Armando, 1973), that is a complete shift in the social organization and cultures.

-Urbanization as a widespread diffusion of urban spatial patterns and urban « life-forms », which all having a « family trait », whatever the context.

Some **major traits** that are oriented urban patterns and « life-forms » :

- Individualization/Anonymity
- Illimitation
- « Mobilization » (everything is on the move)
- Place consumption (iper-places)
- Digitalization
- Connexions (hyperspatiality)
- Standardization and « Normation »

This urbanized world is facing right now an impressive challenge: the **global environmental change**, due to the impacts of human activities on the **earth system**

i. global warming and its multiscale effects;

ii. depletion of non-renewable and even renewable resources;

iii. rapid reduction in biodiversity on a global scale;

iv. unprecedented modification of the metabolism of biotic systems (soils, oceans, waters) due to both the first three developments and the impacts of human activities in terms of pollutants and the diffusion of synthetic chemical molecules.

« The human imprint on the global environment has now become so large and active that it rivals some of the great forces of Nature in its impact on the functioning of the Earth system » (Will Steffen, Jacques Grinevald, Paul Crutzen and John McNeill, "The Anthropocene: conceptual and historical perspectives", *Philosophical Transactions of the Royal Society A*, Vol.369, 2011, p.842-867)

IGBP NEWSLETTER 41

References

Mann, M.E., Bradley, R.S. and Hughes, M.K. (1998) Global-scale temperature patterns and climate forcing over the past six centuries. *Nature* 392: 779-787.

Pett, J.R., Jouzel, J., Raynaud, D., Barkov, N.I., Barnola, J.-M., Basile, I., Bender, M., Chappellaz, J., Davis, M., Delaygue, G., Delmotte, M., Kotlyakov, V.M., Legrand, M., Lipenkov, V.Y., Lorius, C., Pepin, L., Ritz, C., Salzman, E. and Stievenard, M. (1999) Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica. *Nature* 399: 429-436.

Will Steffen

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The "Anthropocene"

by Paul J. Crutzen and Eugene F. Stoermer

The name Holocene ("Recent Whole") for the post-glacial geological epoch of the past ten to twelve thousand years seems to have been proposed for the first time by Sir Charles Lyell in 1833, and adopted by the International Geological Congress in Bologna in 1885 (1). During the Holocene mankind's activities gradually grew into a significant geological, morphological force, as recognised early on by a number of scientists. Thus, G.P. Marsh already in 1864 published a book with the title "Man and Nature", more recently reprinted as "The Earth as Modified by Human Action" (2). Stoppini in 1873 rated mankind's activities as a "new telluric force which in power and universality may be compared to the greater forces of earth" [quoted from Clark (3)]. Stoppini already spoke of the anthropozoic era. Mankind has now inhabited or visited almost all places on Earth; he has even set foot on the moon.

The great Russian geologist V.I. Vernadsky (4) in 1926 recognized the increasing power of mankind as part of the biosphere with the following excerpt "... the direction in which the processes of evolution must proceed, namely towards increasing consciousness and thought, and forms having greater and greater influence on their surroundings". He, the French Jesuit P. Teilhard de Chardin and E. Le Roy in 1924 coined the term "noosphere", the world of thought, to mark the growing role played by mankind's brainpower and technological talents in shaping its own future and environment.

The expansion of mankind, both in numbers and per capita exploitation of Earth's resources has been astounding (5). To give a few examples: During the past 3 centuries human population increased tenfold to 6000 million, accompanied e.g. by a growth in cattle population to 1400 million (6) (about one cow per average size family). Urbanisation has even increased tenfold in the past century. In a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years. The release of SO_2 globally about 160 Tg/year to the atmosphere by coal and oil burning, is at least two times larger than the sum of all natural emissions, occurring mainly as marine dimethyl-sulphide from the oceans (7); from Vitousek et al. (8) we learn that 30-50% of the land surface has been transformed by human action; more nitrogen is now fixed synthetically and applied as fertilizers in agriculture than fixed naturally in all terrestrial ecosystems; the escape into the atmosphere of NO from fossil fuel and biomass combustion likewise is larger than the natural inputs, giving rise to photochemical ozone ("smog") formation in extensive regions of the world; more than half of all accessible fresh water is used by mankind; human activity has increased the species extinction rate by thousand to ten thousand fold in the tropical rain forests (9) and several climatically important "greenhouse" gases have substantially increased in the atmosphere: CO_2 by more than 30% and CH_4 by even more than 100%. Furthermore, mankind releases many toxic substances in the environment and even some, the chlorofluorocarbon gases, which are not toxic at all, but which nevertheless have led to the Antarctic "ozone hole" and which would have destroyed much of the ozone layer if no international regulatory measures to end their production had been taken. Coastal wetlands are also affected by humans, having resulted in the loss of 50% of the world's mangroves. Finally, mechanized human predation ("fisheries") removes more than 25% of the primary production of the oceans in the upwelling regions and 35% in the temperate continental shelf regions (10). Anthropogenic effects are also well illustrated by the history of biotic communities that leave remains in lake sediments. The effects documented include modification of the geochemical cycle in large freshwater systems and occur in systems remote from primary sources (11-13).

Considering these and many other major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term "anthropocene" for the current geological epoch. The impacts of current human activities will continue over long periods. According to a study by Berger and Loutre (14), because of the anthropogenic emissions of CO_2 , climate may depart significantly from natural behaviour over the next 50,000 years.

To assign a more specific date to the onset of the "anthropocene" seems somewhat arbitrary, but we propose the latter part of the 18th century, although we are aware that alternative proposals can be made (some may even want to include the entire holocene). However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data retrieved from glacial ice cores show the beginning of a growth in the atmospheric concentrations of several "greenhouse gases", in particular CO_2 and CH_4 (7). Such a starting date also coincides with James Watt's invention of the steam

GLOBAL
I G B P
CHANGE

Executive Summary

Global Change and the Earth System

A Planet
Under Pressure

W. Steffen
A. Sanderson
P. D. Tyson
J. Jäger
P. A. Matson
B. Moore III
F. Oldfield
K. Richardson
H. J. Schellnhuber
B. L. Turner II
R. J. Wasson



Geology of mankind

Paul J. Crutzen

For the past three centuries, the effects of humans on the global environment have escalated. Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behaviour for many millennia to come. It seems appropriate to assign the term 'Anthropocene' to the present, in many ways human-dominated, geological epoch, supplementing the Holocene — the warm period of the past 10–12 millennia. The Anthropocene could be said to have started in the latter part of the eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane. This date also happens to coincide with James Watt's design of the steam engine in 1784.

Mankind's growing influence on the environment was recognized as long ago as 1873, when the Italian geologist Antonio Stoppani spoke about a "new telluric force which in power and universality may be compared to the greater forces of earth."

Referring to the "anthropozoic era". And in 1926, V. I. Vernadsky acknowledged the increasing impact of mankind: "The direction in which the processes of evolution must proceed, namely towards increasing consciousness and thought, and forms having greater and greater influence on their surroundings." Teilhard de Chardin and Vernadsky used the term 'noosphere' — the "world of thought" — to mark the growing role of human brain-power in shaping its own future and environment.

The rapid expansion of mankind in numbers and per capita exploitation of Earth's resources has continued apace. During the past three centuries, the human population has increased tenfold to more than 6 billion and is expected to reach 10 billion in this century. The methane-producing cattle population has risen to 1.4 billion. About 30–50% of the planet's land surface is exploited by humans. Tropical rainforests disappear at a fast pace, releasing carbon dioxide and strongly increasing species extinction. Dam building and river diversion have become commonplace. More than half of all accessible fresh water is used by mankind. Fisheries remove more than 25% of the primary production in upwelling ocean regions and 35% in the temperate continental shelf. Energy use has grown 16-fold during the twentieth century, causing 160 million tonnes of atmospheric sulphur dioxide emissions per year, more than twice the sum of its natural emissions. More nitrogen fertilizer is applied in agriculture than is fixed naturally in all terrestrial ecosystems; nitric oxide production by the burning of fossil fuel and biomass also overrides natural emissions. Fossil-fuel burning and agriculture have caused substantial increases in the concentrations of 'greenhouse' gases — carbon dioxide by 30% and methane by more than 100% — reaching their highest levels over the past 400 millennia, with more to follow. So far, these effects have largely been caused by only 25% of the world population. The consequences are, among others, acid precipitation, photochemical 'smog' and climate warming. Hence, according to the latest estimates by the Intergovernmental Panel on Climate Change (IPCC), the Earth will warm by 1.4–5.8 °C during this century.

Many toxic substances are released into the environment, even some that are not toxic at all but nevertheless have severely damaging effects, for example the chlorofluorocarbons that caused the Antarctic 'ozone hole' (and which are now regulated). Things could have become much worse: the

The Anthropocene

The Anthropocene could be said to have started in the late eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane.

ozone-destroying properties of the halogens have been studied since the mid-1970s. If it had turned out that chlorine behaved chemically like bromine, the ozone hole would by then have been a global, year-round phenomenon, not just an event of the Antarctic spring. More by luck than by wisdom, this catastrophic situation did not develop.

Unless there is a global catastrophe — a meteorite impact, a world war or a pandemic — mankind will remain a major environmental force for many millennia. A daunting task lies ahead for scientists and engineers to guide society towards environmentally sustainable management during the era of the Anthropocene. This will require appropriate human behaviour at all scales, and may well involve internationally accepted, large-scale geo-engineering projects, for instance to 'optimize' climate. At this stage, however, we are still largely treading on *terra incognita*.

■ Paul J. Crutzen is at the Max Planck Institute for Chemistry, PO Box 3060, D-55020 Mainz, Germany; and the Scripps Institution of Oceanography, University of California, San Diego, 9500 Gilman Drive, La Jolla, California 92093-7452, USA.

FURTHER READING

Marsh, G.P. *Man and Nature* (1864). (Reprinted as *The Earth as Modified by Human Action*) Belknap Press, Cambridge, Massachusetts, 1965).

Crutzen, P.J. & Stoermer, E.F. *IGBP Newsletter 41* (Royal Swedish Academy of Sciences, Stockholm, 2000).

Clark, W.C. & Munn, R.E. (eds) *Sustainable Development of the Biosphere* Ch. 1 (Cambridge Univ. Press, Cambridge, 1988).

Vernadsky, V.I. *The Biosphere* (translated and annotated version from the original of 1926) (Springer, New York, 1998).

Turner, B.L. et al. *The Earth as Transformed by Human Action* (Cambridge Univ. Press, Cambridge, 1990).

McNeill, J.R. *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (W.W. Norton, New York, 2000).

Houghton, J. & T. et al. (eds) *Climate Change 2001: The Scientific Basis* (Cambridge Univ. Press, Cambridge, 2001).

Berger, A. & Loutre, M.F. *C.R. Acad. Sci. Paris* 323 (IIA) 1–16 (1996).

Schellnhuber, H.J. *Nature* 402, C19–C23 (1999).

Reading and discussing

The name Holocene ("Recent Whole") for the post-glacial geological epoch of the past ten to twelve thousand years seems to have been proposed for the first time by Sir Charles Lyell in 1833, and adopted by the International Geological Congress in Bologna in 1885 (1). During the Holocene mankind's activities gradually grew into a significant geological, morphological force, as recognised early on by a number of scientists. Thus, G.P. Marsh already in 1864 published a book with the title "Man and Nature", more recently reprinted as "The Earth as Modified by Human Action" (2). Stoppani in 1873 rated mankind's activities as a "new telluric force which in power and universality may be compared to the greater forces of earth" [quoted from Clark (3)]. Stoppani already spoke of the anthropozoic era. Mankind has now inhabited or visited almost all places on Earth; he has even set foot on the moon.

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