



## The heart of the planet

*Sverker Sörlin*

◀ **PLANET EARTH** – the icon of environmentalism, sweating from the greenhouse effect.

On 11 October 1972, the Academy of Sciences decided “to appoint Paul Crutzen, Ph Lic, as a member of the editorial board for AMBIO”. This was not a particularly surprising decision. The administrative committee had prepared the case as was customary, and the editorial board already included climate researcher Bert Bolin from Stockholm University. He had employed this Dutch engineer in 1959 – his specialism was bridge construction, but his post was in computerised meteorological processing. Crutzen, who was at this time a doctoral student, was to receive his doctorate the following year, 1973, for a thesis in atmospheric chemistry, and in 1995 he received the Nobel Prize in Chemistry with Mario J. Molina and F. Sherwood Rowland for their studies of the decomposition of ozone. But no one knew anything about this in October 1972, just as no one knew that in February 2000, at a meeting in the Mexican city of Cuernavaca, Crutzen would coin the concept of the Anthropocene, which has been proposed as the new official name for our current geological epoch.

It was more of a surprise that the Academy had established an international journal on the environment. The Academy of Sciences had not exactly stepped forward when environmental issues were discussed. What had happened?

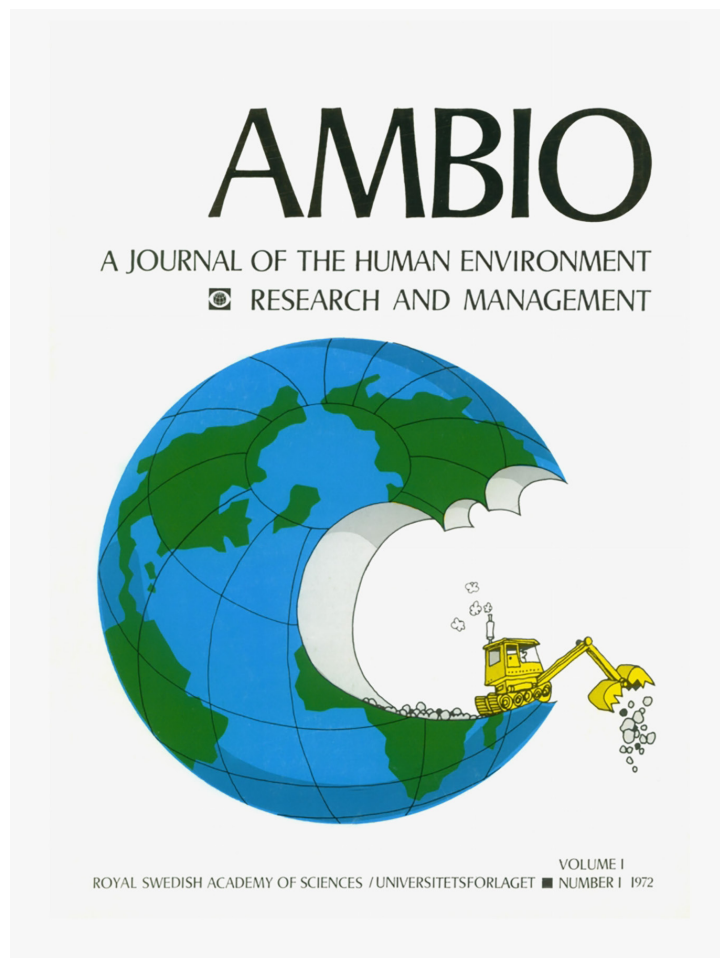
*Ambio* comes from the Latin verb *ambulare*, “walk”, a word that in the Romance languages and English was first synonymous with “surroundings” (*environnement* in French) but which, in the latter half of the 20<sup>th</sup> century, came to mean what we call “the environment”. The decision to establish the journal was taken in 1969, at the same time as the Academy stopped publishing its Swedish language journals for zoology, chemistry and physics. The physicist and journalist Eric Dyring, who was remunerated for a half-time position, began planning in 1970 and the first issue was published in 1972.

The cover shows an Earth being munched through by a digger, which was in practice an illustration of the idea captured by the word Anthropocene: humanity as the single most important geological force.

In the decades following World War Two, the environment's key scientific fields lay within what Peter J. Bowler, many years later, called *The Environmental Sciences*, in his historical overview of the same name (1992). He alluded to the geosciences in a broad sense, from geography and geology to geophysics including oceanography, meteorology and climatology, but also hydrology, ecology and, not least, systems ecology and marine sciences.

A great deal, perhaps most of it, fell outside experimental physics and chemistry, the traditional fields of the Academy of Sciences, at least as they were interpreted by the Academy's Nobel committees. Ironically, for a Nobel laureate in Chemistry, it was not something that Crutzen studied during his years as a programmer at Stockholm University. Perhaps the prize can be regarded as Crutzen being rewarded for his atmospheric research being an environmental issue, which was actually what his supervisor, Bert Bolin, was making the atmosphere. In turn, Bolin had been inspired by his supervisor, meteorologist Carl-Gustaf Rossby, who returned to his Swedish homeland in 1947 after a successful career in the US. In 1956, the same year that Bolin received his doctorate, Rossby had written that humankind was conducting "a unique experiment of impressive planetary dimensions" as it "in just a few centuries, consumes fossil fuels that have been stored for millions of years". There "can be no doubt", continued Rossby, "that an increase in the amount of carbon dioxide in the atmosphere leads to an [...] increase in the Earth's average temperature."

At this time, climate change was not yet an "issue" at a societal level, barely even at a scientific level, but in the meteorological research environment of Stockholm University, it was several years along the way to becoming one. Rossby wrote his prophetic words about the climate in *Naturvetenskapliga forskningsrådets årsbok* [the Swedish Natural Science Research Council's Annual Report] just before his sudden and all too early death. Nor could the Academy of Sciences absorb them; when Rossby returned to Stockholm he was elected a foreign member of the Academy, but had no driving role and remained somewhat of an outsider. Like Crutzen, Rossby had not studied chemistry or physics in the classical manner recognised by the Academy's members. As a young student, he had heard the Norwegian, Vilhelm Bjerknes, lecture at Stockholm University College and, as soon as he had an opportunity, he went to work at Bjerknes' meteorological institute in Bergen, then to Leipzig, and eventually to the USA with a letter of recommendation from Svante Arrhenius in his pocket. Theoretical geophysics was calling him, and another type of chemistry with the entire planet as a laboratory.



**THE FIRST ISSUE** of *Ambio* in 1972, with cover art by Nils Petersson.

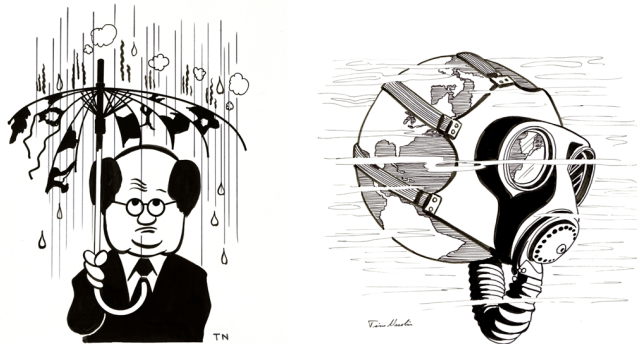
Nor did the Academy of Sciences have a prominent role when environmental issues started to appear on the agenda in the 1950s and 1960s. True, there was the long-standing involvement in issues of nature conservation that it had had since conservation legislation had been established in 1909. The Academy's nature conservation committee, which advised the Swedish government, was tirelessly dedicated to individual cases of nature conservancy, such as Öland's mosses, Lapland's rivers and central Sweden's meadows, often small-scale objects, at the level of farms and fields. "Nature" was the word that was used, not the more modern-sounding "environment", with its connotations of pollution, industry and misuse. But an interest in nature was no guarantee of responsiveness to environmental issues, particularly not on

a planetary scale. One illustration is Georg Borgström, another Swedish researcher – originally a botanist in Lund – who was quick to see the potential of environmental issues and became the warning prophet of population growth and the future food crisis. Borgström also had a career in the USA, as a professor of economic geography at Michigan State University. He was practically kicked out of Sweden after a conflict with the packaging industry, whose research institute he headed. Borgström advocated recyclable glass, but this was not popular with the institute's main sponsor, packaging company PLM. Nor was he welcome at the Academy of Sciences when his name first arose in the 1960s. He was elected as a foreign member later in his life, in 1980, when environmental issues had become established and his own international significance was indisputable (and therefore harmless).

The Academy's metamorphosis in the years around 1970 required an innovator like Bert Bolin; he brought planetary environmental thinking into the organisation. Among the officials, he had the support of Lennart Daléus, subsequently known as a politician, who worked as the Academy's head of information for a period. The external forces for change were just as important. The Academy, however traditional it may have been, could not remain unmoved as environmental opinion gained strength during the 1960s. It was then that the concept of the environment started circulating. As sociologist Ann Mari Sallerberg showed in a study in 1994, this word's breakthrough in Sweden can be unequivocally dated to 1963–1964, which is also when the early environmental movement occurred.

“The environment” soon became something to which really big politics also had to relate, and in that situation the Academy of Sciences turned out to be useful. In 1968, top diplomat Sverker Åström was commissioned by the Swedish government with the task of preparing the UN conference that had been decided and to try to get it located in Stockholm. ICSU, the International Council of Scientific Unions, saw the writing on the wall and established the Scientific Committee on Problems of the Environment, abbreviated to SCOPE. The year was 1969. In 1970, ICSU's general conference decided to make environmental research a top priority and, the following year, the Academy was able to announce, in *KVA Information*, that Sweden and Swedish researchers had a “prominent role”. The environment was the new project of the future.

More and more arrows were now pointing towards Stockholm. Bert Bolin was unceasingly active and had a leading role in the birth of the Global Atmospheric Research Programme. He also represented the Academy of Sciences at another preparatory meeting for the UN conference in the summer of 1971, on “Man's impact on climate”. This was organised in partnership with the Royal Academy of Engineering Sciences and MIT in Boston, and was held at a conference centre on the island of Lidingö, outside Stock-



ILLUSTRATIONS BY TIM NEWLIN for *Ambio* in 1983.

The picture with the umbrella illustrates an article on acid rain, the one with the gasmask an article on chemical warfare.

holm. At home, the nature conservation committee became the subject of a review and, in the spirit of the times, was renamed the environmental preservation committee in 1973, when the Academy's working group for SCOPE was integrated in the organisation.

The UN conference itself was held in June 1972, with Folkets Hus in Stockholm as its hub. Delegations came from 113 countries, many led by heads of state and government, as well as multitudes of authorities and NGOs. An unofficial but, as it turned out, lively and important "People's Forum" was organised in Skarpnäck for stakeholders in civil society and thousands of environmental activists from all around the world. A standard was set for major global meetings: the supreme power should meet the power rising from below, which often consisted of highly qualified experts and religious and civil leaders.

The environment was enough of a force to have a lasting influence on the Academy. A donation allowed it to start the Beijer Institute (the International Institute for Energy and Human Ecology) in 1977, which was renamed the Beijer Institute of Ecological Economics in 1991. When the major international environmental programmes and institutions were shaped in the 1980s, the Academy had already gained an institutional reputation as an environmental actor. It also hosted the International Geosphere Biosphere Programme from 1987 and, in 1988 the UN's Intergovernmental Panel on Climate Change (IPCC) was founded, with Bert Bolin as co-founder and first chair.

When Mistra, a strategic environmental foundation, made a major investment in research in natural resources in the 2000s, the Academy of Sciences was again an asset, now for a consortium of researchers from Stockholm University, the Stockholm Environment Institute and KTH Royal Institute of Technology. With lively support from global partners, the Stockholm

Resilience Centre was founded in 2006, boosting Stockholm's role as an innovative centre for climate and the environment. And when the major international programmes were transferred to a new umbrella organisation, Future Earth, one of the five global secretariats was located at the Academy of Sciences in Stockholm. Institutional tardiness can also be an asset.

It is as if the long road for climate and the environment, from Arrhenius, via Rossby, to Bolin and Crutzen, first led away from Stockholm and the Academy for half a century – but returned there in 1972. *Ambio* was the external sign of this corner being turned. The cover illustration in 1972 – soon another half century ago – captured everything that was happening. It was not just the Earth being gobbled up by human greed; it was also the apple of knowledge that was being eaten. What did it matter if knowledge grew when it was used so thoughtlessly? A picture can also be a question, and sometimes the question is more important than the answer.

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This text builds upon documents in the Academy of Sciences' archive of the nature conservation committee, Academy minutes from the end of the 1960s and early 1970s, *Ambio's* archive and the *KVA Information* newsletter. There is no comprehensive study of the Academy as an environmental actor; it would be an interesting subject for continued research. As regards climate issues, some of the external and institutional factors are described in Bert Bolin, *A History of the Science and Politics of Climate Change* (Cambridge, 2007). The book has the character of a scientific autobiography, with its emphasis on the major international research programmes. Nor is there a compiled historical presentation of the 1972 UN conference, but there are many short reviews and partial analyses, such as Stephen Macekura in *The Rise of Global Sustainable Development in the Twentieth Century* (Cambridge, 2015), and Ken Conca in *An Unfinished Foundation: The United Nations and Global Environmental Governance* (New York, 2015). Ambassador Lars-Göran Engfeldt's *From Stockholm to Johannesburg and Beyond: The Evolution of the International System for Sustainable Development Governance and its Implications* (Stockholm, 2009) is useful for its diplomatic, and particularly its Swedish, perspective on the UN conference. Reports from the Lidingö climate conference in 1971 are in L. Wilson & W. H. Matthews (eds.), *Inadvertent Climate Modification: Report of Conference, Study of Man's Impact on Climate, Stockholm* (Cambridge, MA, 1971). Georg Borgström's fate is described in Björn-Ola Linnér, *The Return of Malthus: Environmentalism and Postwar Population-Resource Crises* (Isle of Harris, 2003). The larger context surrounding the history of the concept of the environment and its breakthrough in the mid-20<sup>th</sup> century is described in Paul Warde, Sverker Sörlin & Libby Robin, *The Environment: A History of the Idea* (Baltimore, 2018). Carl-Gustaf Rossby's remarkable career is described by James R. Fleming, *Inventing Atmospheric Science: Bjerknes, Rossby, Wexler, and the Foundations of Modern Meteorology* (Cambridge, MA, 2016); more details about the Swedish aspects are found in my own short biography, *Carl-Gustaf Rossby 1898–1957* (Stockholm, 2015).