

We are abandoned to weather but also part of the weather; dreams of controlling it have persisted throughout time. Air is the part of the atmosphere we are most commonly in contact with, the one we use for breathing. Life starts and ends with a breath. We have air both inside and outside of us constantly. And were we to examine our individual breath, we would find a composition of nonhuman organisms living in our nasal passages and oral cavities. The human body is in itself a trans-species environment, and air a space where species meet. Air and atmosphere have been and are environments of conflict, not least because they affect our biological body.

A famous painting “An Experiment on a Bird in the Air Pump” depicts one of natural philosopher Robert Boyle’s experiments, demonstrating the reliance of living creatures on air for their survival. Natural philosophers had been disagreeing on the possible existence of vacuum since Aristotle, and the vacuum pump had recently been invented by Otto von Guericke. In the Magdeburg experiment 30 horses failed to pull apart two copper hemispheres, from which the air had been sucked out using Guericke’s pump. Held together only by a joint with a diameter of 50 cm, the experiment demonstrated the force of the surrounding atmosphere’s air pressure. Boyle commissioned the construction of an air pump after he heard about the experiment and soon began studying the properties of air. Experiment 41, the one represented in the painting by Joseph Wright of Derby, was designed to study the respiration of living things. Different creatures were placed in the vessel of the pump and observed. As the air was extracted they all died, and occasionally, when after a few minutes the vessel was opened up, some of them came back to life.

In the late 17th century air pumps were rare and extremely expensive, but a century later they had become more affordable and the “animal in the air pump experiment” was taken up by itinerant “lecturers in natural philosophy” regularly becoming the highlight of public demonstrations. Another popular discovery was nitrous oxide, a gas first synthesized by British polymath Joseph Priestley. The gas was experimented in the Pneumatic Institute, a new medical research faculty, operative in Bristol for three years, where Humphry Davy discovered its euphoric qualities and named it “laughing gas”. Davy introduced nitrous oxide as a recreational drug to the British upper class and the expression “it’s a gas” was soon coined. Laughing gas would be the first anesthetic to be used for surgery, but only 50 years after it was proposed by Davy, possibly because pain was widely accepted and even considered beneficial.

The procedure for the production of nitrous oxide was published in Priestley’s *Experiments and Observations on Different Kinds of Airs*, but the chemist and natural philosopher is better known for his discovery of oxygen, named so by Antoine Lavoisier. Priestley described oxygen as being five or six times better than common air for breathing and probably also for every other use of atmospheric air. He also carried out research with plants, putting a sprig of mint in the closed spaces of his experiments with candles or mice.

candle would burn out rather quickly as it consumed all the oxygen in the confined space, but after some weeks Priestley, by focusing the beams of sunlight onto the candle wick, managed to light it again. He also showed that a mouse kept in a sealed space together with a plant would survive. His experiments were the first to prove that plants somehow change the composition of air.

Cyanobacteria, or blue-green algae is a bacteria that produces its energy through photosynthesis, liberating oxygen as a waste product. It evolved around 3,5 billion years ago. One billion years later the levels of free oxygen had dramatically changed the composition of the earth's atmosphere. The Oxygen Crisis is responsible for the extinction of huge masses of anaerobic organisms. It also made it possible for new life forms to evolve. Algal blooms occur when there is a rapid increase in the population of algae in a water system. They've become more frequent as nutrient loading from human activity increase. It results in hypoxic or low oxygen conditions as it uses the oxygen dissolved in the water. As there are no longer creatures adaptable to these circumstances they become dead zones in the seas. The high concentration of algae discolors the water, varying in color from green to purple or even pink. In 1972 a very toxic red tide, the result of cyanobacterial outbreak occurred in New England.

The red tide coincided with the first ever international environmental conference, organized in Stockholm. Representatives from 113 countries travelled to Sweden to discuss human impact on the environment. For centuries environment had been looked upon as an indispensable condition for the development of a society, but society's impact on environment limited due to difference in timescales. Geology changed so slightly and the earth processes were considered so powerful that it was believed there was nothing man could do to alter them. Human intervention might have remained insignificant for a long time, but by the middle of the 20th century man had reached numbers and invented technology on a scale large enough to become a geological agent. Exceeding seven billion in world population, we now have a significant impact on some of the most basic processes of our planet. From being a prisoner of climate, humanity has become a force of nature, capable of change.

We live in the Holocene era. A geological era which started 12 000 years ago, after the last ice age, and which owing to its milder climate permitted the development of human civilization. At a conference in year 2000 atmospheric chemist and Nobel Prize winner Paul Crutzen argued the world has changed so much, mainly as a direct consequence of the industrial revolution, that we are now living a geological era of our own making. He suggested the current epoch should be renamed the Anthropocene, the human period. Man is now wielding a geological force, and our actions have become determinant for our surrounding. We now make weather, but only collectively, and as a species. The geological planet in itself is under no threat, if there is threat it concerns our conditions of life. We evolve, not only culturally, but also as a biological body, and the future we are constructing is common.