

James Lovelock

James Lovelock

Lovelock in 2005

Born	26 July 1919 Letchworth , Hertfordshire , England, UK
Died	26 July 2022 (aged 103) Dorset , England, UK
Nationality	British University of Manchester
Alma mater	London School of Hygiene & Tropical Medicine University of London Harvard Medical School
Known for	Electron capture detector Gaia hypothesis FRS , 1974 Tswett Medal, 1975 ACS , 1980 WMO Norbert Gerbier Prize , 1988
Awards	Dr A.H. Heineken Prize for the Environment, 1990 Volvo Environment Prize , 1996 Companion of Honour , 2003 Wollaston Medal ^[5] , 2006 Arne Naess Chair in Global Justice and the Environment ^[6] , 2007
Scientific career	
Fields	Chemistry , Earth science
Institutions	Independent researcher

James Ephraim Lovelock [CH](#) [CBE](#) [FRS](#) (26 July 1919 – 26 July 2022) was an English independent scientist. He became an environmentalist and [futurist](#). He was best known for proposing the [Gaia hypothesis](#). This suggests the [biosphere](#) is a [self-regulating system](#).^[1]

After the development of an instrument in the late 1960s, Lovelock was the first to detect the widespread presence of CFCs in the atmosphere.^[2] He found a concentration of 60 parts per [trillion](#) of [CFC-11](#) over [Ireland](#). He went on to measure the concentration of CFC-11 from the [northern hemisphere](#) to the [Antarctic](#) aboard the research ship RRS *Shackleton*.^{[3][4]}

Gaia

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Lovelock developed his Gaia ideas after working for [NASA](#) on detecting life on [Mars](#).^[5]

The Gaia hypothesis proposes that living and non-living parts of the Earth form a [complex interacting system](#) that can be thought of as a single [organism](#).^{[6][7]} Named after the [Greek goddess Gaia](#) at the suggestion of novelist [William Golding](#),^[4] the idea is that the [biosphere](#) has a regulatory effect on the Earth's environment which acts to sustain life.

While the idea was readily accepted by many in the environmentalist community, it has not been widely accepted by other scientists. Among its more famous critics are the [evolutionary biologists Richard Dawkins, Ford Doolittle, and Stephen Jay Gould](#).^[8] Lovelock has responded to these criticisms with models such as [Daisyworld](#), which illustrate how individual-level effects can translate to planetary [homeostasis](#), under the right circumstances.

Global warming

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In Lovelock's 2006 book, *The Revenge of Gaia*, he argues that the destruction of [rainforests](#) weakens Gaia's capacity to control [greenhouse gases](#) in the [atmosphere](#). If so, the planet's [negative feedbacks](#) would weaken, and [global warming](#) would continue to increase.

The warming of the oceans is extending the oceanic [thermocline](#) layer of tropical oceans over the [Arctic](#) and [Antarctic](#) waters. This would prevent the rise of oceanic nutrients into the surface waters and eliminate the [algal blooms](#) of [phytoplankton](#). As phytoplankton and forests are the main ways in which Gaia draws down [carbon dioxide](#), taking it out of the [atmosphere](#), the elimination of this environmental buffering will see, according to Lovelock, most of the earth becoming uninhabitable for humans and other life-forms by the middle of this century, with a massive extension of tropical [deserts](#). This rather extreme view is held by only a few other scientists.

In his most recent book, *"The Vanishing Face of Gaia"*,^[9] he suggests that we may already be beyond the tipping point of terrestrial climate into a permanently hot state. Given these conditions, Lovelock expects human [civilization](#) will be hard pressed to survive. He expects the change to be similar to the [Paleocene-Eocene Thermal Maximum](#) when atmospheric concentration of CO₂ was 450 ppm. At that point the [Arctic Ocean](#) was 23 °C and had [crocodiles](#) in it,^{[10][11]} with the rest of the world mostly [scrub](#) and desert.

Climate engineering

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In September 2007, Lovelock and Chris Rapley proposed the construction of ocean pumps to pump water up from below the thermocline to "fertilize algae in the surface waters and encourage them to bloom".^[12] The basic idea was to accelerate the transfer of carbon dioxide from the atmosphere to the ocean by increasing [photosynthesis](#) and increasing the export of organic carbon (as "marine snow") to the deep ocean. A scheme similar to that proposed by Lovelock and Rapley is being independently developed by a commercial company.^[13]

Lovelock subsequently said that his proposal was intended to stimulate interest, and research would be the next step.^[9]

Death

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Lovelock died on 26 July 2022, his 103rd birthday, at his home in [Dorset, England](#) from problems caused by a fall.^[14]

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