Homage to Gaia: The Life of an Independent Scientist


James Lovelock is an independent scientist, environmentalist, and researcher, and the subject of the autobiography Homage to Gaia. Lovelock’s place as an inventor and scientist emerges clearly from his curiosity about the natural world, apparent from a young age. Fortunately, an experiment to test deadly berries on young girls at school was stopped on time. When he was four, his father gave him a wooden box filled with electrical odds and ends for Christmas, and this stimulated Lovelock’s ongoing questioning of how and why things work.

The book depicts what it is like to grow up in a poor London neighborhood, to bring frozen hamsters back to life, and to make some of the most valuable discoveries of the twentieth century. It discusses in depth his early life and how he gradually became so well regarded in the scientific community that he was sought after as a consultant around the world. It also expresses with great clarity Lovelock’s opinions of many of the people he worked with, including many well-known scientists working on the environment among many other contemporary scientific issues.

Lovelock began his career as a professional scientist in a constant struggle to reconcile the freedom of thought necessary to produce innovative research and the restrictions of institutional policies. However, he soon finds an adventurous path working as an independent scientist. He leaves the Mill Hill Institute, and begins – first in the United States and subsequently in Britain – what he describes as the independent practice of science, which has continued to this day. He later became an advisor to Shell, Lord Rothschild, and many others.

Among the impressive inventions he is known for is the argon detector, which analyzes compounds from a gas chromatograph column, as well as a device for measuring the intensity of heat radiation, the first working microwave-oven model. One of Lovelock’s most important inventions is the Electron Capture Detector (ECD) which he discovered in 1957. The ECD is very sensitive and can detect a few parts per trillion of pollutant gases released into the atmosphere, and ultimately led to the discovery of ozone depletion. The fascinating tales behind each of these inventions reflect the life of the author and inventor.

Lovelock also postulates that the Earth functions as if it were a living organism. Written for non-scientists, this book is a journey through time and space, in search of evidence in support of a new and radical model of our planet. The Earth, Lovelock proposes, behaves as if it were composed of all its inhabitant organisms, including their environment. In contrast to the conventional perception, the book explores the theory that the Earth’s matter – air, water, and land – forms a complex system which has the capacity to sustain life. Lovelock argues that such factors as oxygen content, cloud formation, and the chemical composition of the oceans are controlled by interacting physical, chemical and biological processes. The hypothesis has been very useful in facilitating important discoveries about Earth systems.

For example, although the Earth’s atmosphere is in chemical disequilibrium, it is stable and has been so for billions of years. For Lovelock, this implies that some sort of regulatory system must exist. If most atmospheric gases came from living organisms, then there must exist a mechanism of regulation through a feedback system. Lovelock’s friend, the novelist William Golding, suggested Gaia as the name for a self-regulating Earth.

The Gaia hypothesis has developed over time. To illustrate the method by which feedback systems maintain stability, Lovelock invented a model called Daisyworld. In it, black and white daisies act to their own selective advantage as a kind of planetary thermostat. Lovelock does a great job describing the initial reactions to the Gaia hypothesis. For chemists, physicists and engineers familiar with feedback systems, it created no difficulties; however, it was opposed by most biologists. This objection was further supported by the fact that the Gaia hypothesis became very attractive to the hippie movement who saw Gaia as a mother-goddess. Subsequently, it has taken time and careful research to establish the Gaia hypothesis as a scientific earth system.

Lovelock’s autobiography reflects his remarkable character as a scientist in his refusal to unquestionably accept dogmas. His success as an inventor and a scientist stems from constantly doubting the conventional wisdom and from the integration of different disciplines. Lovelock is suspicious of big science, peer review, and institutions. This skeptical, independent attitude makes the book a fascinating read and enjoyable to anyone with an interest in science.

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