

Of Clarity and Climate Change

A Review of James Lovelock's “The Revenge of Gaia”*

**By
David Wasdell**

Reactions, responses and reviews of Lovelock's new book have attacked him for being pessimistic, or taken issue with his espoused energy policy. In contrast, this review cuts through to the realism behind the pessimism and highlights the fundamental scientific analysis of the dynamics of climate change that lies at the heart of Lovelock's testament. Distinguishing carefully between that which can no longer be changed (too late!) and that in which humanity still has the opportunity to intervene (the working agenda), the review brings clarity to an area of eco-confusion. Lovelock's weakness in the field of social science is identified as the source of his inappropriate despair and the book is hailed as a clarion call to effective collective action.

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Like a bridge over a veritable canyon of troubled water, Lovelock's latest contribution stands in danger of becoming detached at both ends. On one bank stands a posse of rigorous climatologists and systems analysts who find his (confessedly metaphorical) references to Greek Goddesses, planetary self-consciousness and anthropomorphic tendencies, so alienating that they discard the serious scientific baby with the bathwater of hubris. Facing them across the canyon that divides modern science from New Age superstition, is grouped a gaggle of animists, pagans and "spiritual" greens, who find his scientific rigour too much of a challenge to their collective delusions. The outcome is a mutual pact to ignore the reality of the torrent of climate change raging between them.

A physician by training, profession and personal *Weltanschauung*, Lovelock perceives the behaviour of the complex adaptive system of the planet in terms of an immune response. Earth has a rising fever that threatens its very life. The proliferating viral agent, cause of the global inflammation, is in the last doubling period of the infection. It will either destroy its host and face consequential extinction, or radically modify its behaviour in order to reach some viable *modus vivendi*. The sickness of the patient may, however, have progressed too far for the second option to be achieved.

"The Revenge of Gaia" was described as pessimistic in the Independent Leader, and it is perhaps not surprising that it is this facet that brought the most intense knee-jerk reactions from compulsive optimists around the world. So Flannery from Sydney and Juniper from London chorused that we must not give up hope, this is no time to despair, there is still time to intervene to abort the impending apocalypse. Beyond the "Boo-Hurrah" wars of pessimists and optimists, it is time to hear the still small voice of realism.

Emotion always plays a powerful part in our perception of reality. There is widespread sympathy for the American psychologist who sighed "I wish I could become a village idiot so that I did not have to understand this material". Then there was the European bureaucrat who dismissed one report as "Unduly alarmist (I hope!)", or the systems analyst who described the "Spectre of despair that stalks the corridors" of climate research institutions. Some of the emotions flow from the enormity of the material itself. Others have their roots in the perception of the impotence of human institutions to react quickly and effectively to the emerging crisis. In this as in all other situations, the task of the scientific community is to own its all too human emotions, deal with its depression, and then to cut through the fog of feelings to the sharp reality of facts.

**"Too late! Too late!" Jim Lovelock cried.
"Too late for what?" we all replied.**

Much of the confusion in “The Revenge of Gaia” and in the immediate responses to it, stems from the range of different answers to that question.

Firstly, increased concentration of greenhouse gasses in the atmosphere has already set in motion certain patterns of climate change, some of which may be dangerous. The long time-delays between cause and effect mean that the working through of climate change driven by current levels of GHG concentration will take many decades, even if we halted the increase in concentration now. These change are inevitable. We will have to live with the consequences and adjust to them as best we can. It is too late to stop climate change at this level.

Secondly, the rate of emission of greenhouse gasses is still increasing and continuing to drive up the concentration levels of atmospheric GHGs. With the best will in the world it is going to take some time to reduce the anthropogenic emission rate to the level of the global absorption rate. The extra concentration of GHGs generated during this period will inevitably drive further climate change, however fast we act. It is too late to prevent that from happening. We will have to live with the consequences while doing our utmost to minimise them.

Thirdly, as heat energy and temperature rise in the earth system, certain sub-systems will reach a “critical threshold” or “tipping point”. This is the state in which they can move comparatively quickly from one stable pattern of behaviour to another, the basis for “Rapid Climate Change”. About nine such mechanisms have been identified. Perhaps the most familiar is the stopping of the thermo-haline conveyor (THC). This is the deep sea-bed current of cold, dense, salty water that streams south from the far North Atlantic. It displaces a surface current of warm, less-dense water from the tropical areas towards the North-Western European seaboard. This is the Gulf Stream which keeps these shores some 5-8°C warmer than they would otherwise be. As global warming raises sea-surface temperature, and as salinity in the North Atlantic drops because of large flows of fresh water from melting land-ice, so the THC slows, reaches a critical threshold and stops. Over the next century that could cool North-Western Europe, re-distributing the heat energy to the tropical Western Atlantic area. It could take many hundreds of years for salinity level in the far North Atlantic to recover sufficiently to reach a reverse tipping point and reactivate the THC. It may already be too late to avoid activation of several of these sub-system tipping points, triggered by global warming already set in motion and about which we can do absolutely nothing. We will have to live with the consequences.

Fourthly, we need to examine the behaviour of the earth as a whole. The sub-system switches described above redistribute heat. They cause (potentially dramatic) local climate change, but have no effect on the average temperature of the overall global system. At macro level the average global temperature has been kept within bounds by a set of negative feedback mechanisms. (Negative feedbacks damp change and return values to equilibrium when something has disturbed them.) Human industrial activity and the cumulative emission of greenhouse gasses have steadily eroded the negative feedbacks and set off an increasing range of positive feedback mechanisms. (Positive feedbacks accelerate change, driving values further and further from equilibrium when something has disturbed them.) The whole earth system is therefore subject to a critical threshold or tipping point as the net effect of positive feedback begins to overpower the controlling effect of negative feedback. The outcome is accelerating or runaway global warming. There is solid evidence that crossing this tipping point is inevitable. It may already be behind us. If not, then climate change

Failure to act urgently and effectively within this narrow time-window will propel the whole earth system over the final critical threshold. Beyond that point the positive feedback system becomes overpowering, and human intervention no longer has any ability to reverse the outcome. We will have triggered an extreme climate catastrophe the like of which has only been experienced in the four or five great extinctions which have occurred during the history of life on earth. That window is still open. It is not yet too late to act. We do not inevitably have to live with the consequences of unstoppable climate catastrophe at a global level.

Despair at this level is therefore inappropriate. We have work to do. We must avoid all diversion from active problem-solving into survival activity, be it preparation for a new dark age of near-extinction, global struggle for dwindling resources, collapse of civilisation into raiding bands of feudal war-lords, the resigned hiding of records, burying of genetic seed banks, or the retreat of a few mating couples to Antarctic sanctuaries

In “The Revenge of Gaia”, Lovelock does not distinguish sufficiently between the onset of positive-feedback-driven climate change and the final tipping point beyond which all human hope is futile. The resulting confusion is strategically paralysing. It is not yet too late. It is still humanly possible to avert catastrophe, but not for long, and not if we fail to act concertedly and effectively at a global level.

Lovelock’s “last testament” is not a signal for global despair, but a wake-up call, a call to global action. It is a call to recognise the state of global emergency which we now face, and to act accordingly. It is a call to brand carbon dioxide as an eco-toxin that threatens us with the destruction of human civilisation, and our world with the elimination of life as we know it. His legacy stems from his extraordinary capacity to see the earth as a whole, to grasp in a single vision the complex interactive web of life-sustaining dynamics. That was a work of genius which is only now beginning to be acknowledged. Sadly his competencies as an analyst of earth systems are not matched by comparable understanding of the dynamics of social systems. He cannot conceive of the capacity for the transformation of political ideologies, the overthrow of the strangling grip of economic vested interests, the rejection of the feeding frenzy of capital accumulation, the possible recovery from addiction to the opiate of growth, the metamorphosis of value-systems, the sloughing off of consumerism and its replacement with responsible conservatism. He has no perception of the capacity of the human spirit to rise in an act of collective transcendence in the face of the greatest threat the species has ever had to face. In that, and not in his analysis of Gaian dynamics, lies the ground of Lovelock’s despair.

It is because he has no hope that humanity can act collectively, effectively and in time, that he counsels us to prepare for the worst. It is up to us to prove him wrong.

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* “The Revenge of Gaia” is published in February 2006, by Allen Lane, an imprint of the Penguin Group.