

Gaia and Climate Change

In June 2004 James and Sandy Lovelock convened a conference on 'Climate Change' at Dartington Hall and invited me to take part. This led to the publication of my book *Gaia and Climate Change* in 2009. Now, in the final part of its Fifth Assessment Report, the UN's Intergovernmental Panel on Climate Change has concluded that not only is warming of the climate system 'unequivocal' but that the human influence is clear. Atmospheric concentrations of carbon dioxide and other greenhouse gases are at their highest level for 800,000 years. The last time CO₂ reached such a peak humans did not exist.

That is where we are now. But the title 'Gaia and Climate Change' takes us back much further in history; to 'the beginning of earthly time' when our planet 'Earth/Gaia' began to be created. This takes me back to the book of Job, where the questions God puts to Job and by extension, to us today, challenge the accepted understanding of our place in the world. For me, the unknown author of Job is the David Attenborough of the Bible. For he evokes the same sense of awe at the interconnectedness with the natural world while exposing our ignorance of its integrity and now, our abuse of its resources.

For a start, God points out to Job, to us and to today's Panel on Climate Change the obvious truth: that none of us were there when Gaia was being created and the foundations of the Earth were laid:

Tell me, if you have understanding.
Who determined its measurements—surely you know!
Or who shut in the sea with doors?
Have you commanded the morning since your days began,
and caused the dawn to know its place?
Have you entered into the springs of the sea,
or walked in the recesses of the deep?
Can you lift up your voice to the clouds
that a flood of waters may cover you?

Who has left a channel for the torrents of rain,
and a way for the thunderbolt
to bring rain on a land where no man is,
on the desert in which there is no man;

to satisfy the waste and desolate land
and to make the ground put forth grass?...
Do you give the horse his might? Do you clothe his neck with
strength?
Is it by your wisdom that the hawk soars,
and spreads his wings toward the south?

This key biblical passage has a very contemporary resonance. For it challenges the prevailing religious and cultural self-image of ourselves as uniquely chosen owners, makers and masters of Earth, its creatures, its waters and lands; and therefore supposedly entitled to act as 'sole traders' of its resources. This self-image assumes that such a uniquely privileged position entitles us to appropriate Earth's resources and, whatever the consequences for its other creatures, use them primarily for our benefit. In today's terms, for monetary gain. Now, however, science is telling us that human-induced climate change is a globally visible effect of acting on such an assumption: visible in the warming of the oceans, the disappearance of species and the melting of the Arctic ice cap.

Against this background, God's challenge to Job can be heard as a call for what I call ecological humility: that is, knowing and accepting our place within the Earth community and our shared dependence on its resources. And then acting on that knowledge. Contemporary scientific grounds for doing so are now supplied by increasingly sophisticated technologies that bring together up-to-date versions of the emergent events spelt out to Job by God. We have indeed 'entered into the springs of the sea' and 'comprehended the expanse of the Earth'. We now know that 'the foundations of the earth were laid' about 4.6 billion years ago, through a supernova explosion close to clouds of hydrogen and helium. James Lovelock named this foundational event 'the birth of Gaia'.

Science also gives us a present-day "God's eye view" of Gaia from space. We see it now as one whole body; home over centuries to countless species, ours among them, who, before and since we emerged, have interacted with and been reabsorbed over time into their earthly environments. This perspective reinforces the fact of Earth's wholeness. It also helps us begin to grasp what Aristotle meant when he said that

nothing is accidental in the works of Nature: everything is, absolutely, for the sake of something else. The purpose for which each has come together or come into being deserves its place among what is beautiful (Leroi, p. 10)

Those ancient views of Earth/Gaia – from Job’s sense of wonder to Aristotle’s more analytic overview – have been given a new dimension by Gaian science. This assumes that Earth’s atmosphere, climate, soil, geography and inhabitants are aspects of one living, vibrant body; and that what happens to one aspect ultimately affects the whole. For as Lynn Margulis showed, this body is one on which and in which organic beings (including ourselves) continually interact with their environments and ultimately, with each other. So soil, for instance, is not unalive. It is a mixture of broken rock, pollen, fungal filaments, ciliate cysts, bacterial spores, nematodes and other microscopic animals and their parts where, little by little, Nature proceeds from things lifeless to animal life. This happens in such a way that it is impossible to determine an exact line of demarcation between lifeless and living; for organisms continuously interact via water, soil and air.

Darwin likened the complexity of these interactions to ‘an entangled bank’, one too complex for us humans even to begin to sort out. Now, however, technology has opened up this complexity and interactivity in ways Darwin could never have imagined. As a result, Margulis says, any claim by our own species to existential independence is clearly seen for what it is: a political and not a scientific reality. Interdependence is the condition of possibility for every form of life, including ours. Scientific understanding of what happens between as well as within living organisms now extends to the interactions between us and micro-organisms; and between us, all these and ultimately, the planet as a whole.

Schrödinger alerted us to the dangers inherent in a point of view where we consider, examine or assess these interactions as if we are external to their existence. Of course that was before we saw Earth from space. But such a temporary detachment from Earth that makes such a view possible is just that: a fleeting glimpse of some aspect of an interdependent whole of which we essentially and therefore necessarily remain a part. Today we are beginning to understand and acknowledge that our attitude to and our role in these interactions affects all Earth’s creatures; including ourselves. With interdependence comes interactivity; and with that comes change.

So the range of life forms on Earth has evolved to a point far beyond what they were ‘in the beginning’; some to the point of extinction. Once there were dinosaurs; now there are none. As with other species, their extinction leaves some clues as to why it occurred. Generally speaking it happens because a species’ resource base collapses.

Earth provides our species' shared resource base. Once there were no human beings. Now, as I point out in *Exploring Earthiness*, through our appropriation, colonization, monetization, marketization and devaluing of Earth's resources, we have reached a density of population and a scale of demand on that resource base such that one day we too may become extinct. For in spite of technological advances, we remain absolutely dependent on that global resource base; one maintained through climatic balances within a self-regulating system.

Human-induced climate change now threatens those balances. In his 1991 book, *Gaia: the Practical Science of Planetary Medicine*, James Lovelock showed how atmosphere, oceans and land are involved in metabolic processes that link the biochemistry of organisms with the planet-wide biochemistry of Earth; and how these processes actively regulate Earth's climate; that is, keep it comfortable for life; including human life. And as that balance exists, as far as we know, on no other planet near us in the universe, then even if we could migrate beyond this planet there is nowhere that would sustain human life. (It would be 'life, Jim, but not as we know it!') Within Earth's system alone, at every interactive level from microbe to planet, we organic beings use air, water, soil and other organic beings to build and maintain our reproducing selves.

This means, as Lynn Margulis pointed out in 1995, that life does not exist on Earth's surface so much as it is Earth's surface. Every breath ultimately connects us to the rest of the biosphere, which also 'breathes': albeit at a slower pace. Now, however, that breath is marked by increasing carbon dioxide concentrations (pp 27-28). For Lovelock, Margulis and climate scientists today, these effects and their causes appear self-evident. Yet it is precisely because they appear obvious to them that it has taken non-scientists like me a long time to be able to understand their connection with my life now: in other words, to grasp, however inchoately, what makes my life on Earth possible. And what may, or may not, ultimately make human life impossible.

In 1992 I took part in the opening course on *The Health of Gaia* at Schumacher College. This brought home to me the necessity for a phase change in Christian religious understanding of our relationship with Earth, an understanding that has shaped and continues to shape the dominant western modern culture. So while we may no longer publicly claim to be God's privileged stewards of the lands we live on, cultivate or claim to own; or endorse our claims with biblical texts, we simply assume

our right to do so. Changing that understanding, however, requires more than a theological, philosophical or cultural shift. It means interpreting the relationship between Earth, ourselves, all Earth's creatures and their life support systems in the light of what science tells us about the evolution of life on Earth; about our dependence on those support frameworks and our effects on them. Those effects are summed up in global climate change.

My understanding of the strength of the political and economic aspects of these relationships was further enlarged when the World Council of Churches invited me to be part of their delegation to the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. Like many attempts at global decision-making, the practical outcomes of the Rio Conference were, to say the least, disappointing for those who hoped for significant changes. For me, there was a key moment anticipating that disappointment when a Swedish reporter came in and told the delegates: 'We've been wiped off all the front pages in Europe because politicians are voting on monetary union and the Maastricht Treaty!'

This overriding cultural focus on our relationship with money (in all its forms), at the expense of our relationship with the earthly environment (in all its complexity), exemplified and continues to exemplify political, economic and social policies and priorities. Financial concerns have trumped and continue to trump environmental problems and concerns. That 'lightbulb' moment in Rio now illuminates present-day shots of the Brazilian rainforests and of the forests of Southern Asia being slowly but surely decimated in order to grow cash crops (such as palm oil). This is exported to world markets – and processed for sale in supermarkets. A process that will continue as long as the 'economy' is given unquestioned political priority over the natural environment, both nationally and globally.

In *Gaia and Climate Change* and now in my latest book, *Exploring Earthiness*, I have attempted to trace and clarify the historic role played by Christian religious forces in this prioritising. The seventeenth century philosopher, politician and lawmaker John Locke both embodied, sanctioned and clarified this role when, in regard to the colonization of America, he wrote:

Revelation gives us an account of those grants God made of the world to Adam, and to Noah and his Sons, in which 'tis very

clear that God, as King David said (Psalm CXV, xvi), has given the Earth to the children of Men, given it to Mankind in common. [No women so endowed!]

Locke also remarked that the gradual introduction of money into society was a crucial factor in the colonizing enterprise of 'enlargement of possessions'. For

before the desire of having more than men needed had altered the intrinsic value of things, they had agreed that a little piece of yellow Metal, which should keep without wasting or decay, should be worth a great piece of Flesh, or a whole heap of corn.

Presciently he wrote:

in the beginning all the world was America. And more so than that is now; for no such thing as Money was anywhere known. Find out something that hath the use and value of Money amongst his neighbours, you shall see the same man will begin presently to enlarge his possessions.

Another 150 years would pass until merchant capitalism, based on war, conquest, trade and slavery, gave birth to the industrial capitalism of today. This remains based on the notion, indeed the conviction voiced by Locke, that 'the desire to have more than we need' has altered the intrinsic value of things. And it is now clear that the role played by money in satisfying that desire has totally changed our perception of and relationship with Earth. Its global geophysical effects, including the acceleration of climate change, are summed up in the fact that 5% of Africa's agricultural land, an estimated 70 million hectares, has been sold or leased to western investors since 2000 and that that 'investment' is expected to double by 2015.

Reactions to this state of affairs by those most closely affected by it is contained in a copy of the '*Earth Charter*' produced in Rio by Non-Governmental Organizations (NGOs) and attached as an appendix to *Exploring Earthiness*. I would like to finish by asking you to join with me in reading it.