Sermon Delivered by Howard Hague
at Essex Church, 16th August 2009

Gaia – Earth Goddess or Avenging Angel?

My second reading this morning will have given you something of the flavour of James Lovelock's most recent writing on Gaia, from the book published earlier this year. However if anything he has toned down the gloom and doom slightly from the first book of his that I read, which was called *The Revenge of Gaia*, and published in 2006. It must be admitted that his view of the world's future is rather pessimistic, but I think his perspective is important and needs to be heard. Indeed every new report that has come out recently seems to lend weight to his arguments, whether it be on climate change, energy or the need for increased food production.

In Greek mythology Gaia was the goddess of the earth, and one of the first creatures to be born from the primeval chaos. The Gaia theory, which Lovelock developed in the late 1960s and early 1970s, sees the earth as a self-regulating mechanism made up from the totality of organisms, the surface rocks, the ocean and the atmosphere all tightly coupled together as an evolving system. The theory sees this system as having a goal, namely the regulation of surface conditions so as always to be as favourable as possible for contemporary life, whatever that is at the time. My Macmillan encyclopaedia at home adds the rather ominous sentence: "It also suggests that the earth is capable of ridding itself of any species that adversely affects the environment." It could be said that aspects of Gaia theory bear some similarity to the position of theologians who say that conditions on earth are exactly right for life to develop, as part of some divine plan.

It is generally thought that the Gaia theory is accepted by many conservationists, but is rejected by most mainstream scientists. However at a meeting in Amsterdam in 2001 – at which four of the principal global-change research programmes were represented – more than a thousand delegates signed a declaration that had as its first main statement "The Earth system behaves as a single, self-regulating system comprised of physical, chemical, biological and human components." There is no doubt that recent work on climate change, for example that the activity of algae in the oceans can affect cloud formation and so climate, has lead to a greater appreciation of what the Gaia theory is saying.

James Lovelock, who was 90 in July, is planning a trip into space later this year as Richard Branson's guest aboard Virgin Galactic's SpaceShipTwo. Clearly he is still determined to make the most of life while he can, even though many newspaper and magazine articles about him tend to be headed 'We're doomed', or words to that effect. He was trained as a chemist, and did a lot of work on atmospheric CFCs (chlorofluorocarbons) which led eventually to a global CFC ban that saved us from ozone-layer depletion. Interviewed for the *New Scientist* magazine in January this year, he was asked whether we had time to do a similar thing with carbon emissions to save ourselves from climate change. He replied in typically robust fashion and said: "Not a hope in hell. Most of the 'green' stuff is verging on a gigantic scam. Carbon trading, with its huge government subsidies, is just what finance and industry wanted. It's not going to do a thing about climate change, but it'll make a lot of money for a lot of people and postpone the moment of reckoning." I'm glad it's not just me who has had serious doubts about the idea of carbon trading. I've never understood how different organisations or countries buying each other's carbon allocations is going to help anyone in the long run, if we don't actually reduce the amount of carbon that we put into the atmosphere in the first place.

There can surely be little doubt now that climate change and global warming are taking place, and at a faster rate than anyone expected even a few years ago. Severe storms, very heavy rainfall, flooding, heatwaves in Australia every 1-2 years rather than every 20 years as previously, are all indicative that something unusual is happening. Professor Chris Field of Stanford University, who is a leading member of the UN Intergovernmental Panel on Climate Change, hit the headlines in February this year by saying that without decisive action, climate change this century is likely to accelerate at a much faster pace and cause more environmental damage than previously predicted. He said: "There is a real risk that human-caused climate change will accelerate the release of carbon dioxide from forest and tundra ecosystems, which have been storing carbon for thousands of years. We don't want to cross a critical threshold where this massive release of carbon starts to run on autopilot." He went on to say that between 2000 and 2007, greenhouse gas emissions increased far more rapidly than expected, primarily because developing countries like China and India saw a huge upsurge in electrical power generation, almost all of it based on coal. James Lovelock's great concern, as

outlined in his 2006 book *The Revenge of Gaia*, is that the earth may become hot enough to melt most of the Greenland ice and some of the West Antarctica ice, resulting in sea level rises of about fourteen metres. Of course sea levels have always risen and fallen over the millennia, for example during ice ages, but he comments that nearly all of our present great centres of population are currently below what could be the ocean surface in a mere blink of geological time, including of course London and New York.

You would think that the proponents of the Gaia theory and environmentalists would be natural allies in their struggle to save the planet. However this has been less and less the case in recent years, not so much because they differ in their analysis of the problem, but in their proposed solutions. Lovelock has outraged many in the green lobby by his promotion of nuclear power. He believes that nuclear power with its almost zero carbon emissions is the only source of energy that will satisfy our demands and yet not be a hazard to Gaia and interfere with its capacity to sustain a comfortable climate. He sees no other safe and reliable alternative for the large-scale production of electricity for our world. He also believes that the problem of nuclear waste has been exaggerated, particularly with the present and future nuclear power plants producing far less waste than in the past. He has even offered to store the high-level waste produced in a year from one nuclear power station – which he estimates at one cubic metre- on his own land. What his neighbours think about this is not stated. *The Times* reported earlier this year that Sweden is to build nuclear reactors for the first time in thirty years, abandoning a decades-old commitment to phase out nuclear power. A number of other countries are now doing the same, and the British government seems to be going the same way. Lovelock hopes that they will stick with this new policy, even though it may not be popular with everyone.

The Foy Society, a group which is sometimes called the 'think tank' of the Unitarian movement, organises an annual conference on a theme of topical interest, and chose to examine alternative energy a few years ago. We looked at wind turbines in some detail, and the general feeling was that they were not the best way forward. This view was not based on aesthetic reasons, though wind farms are scarcely a pleasing addition to the landscape, but on the grounds of efficiency. Because the wind does not blow all the time – or indeed sometimes blows too much - energy is available from wind turbines for only about 25% of the time, and during the remaining 75% electricity has to be produced in standby fossil-fuel power stations. Offshore wind turbines are more efficient, there being more wind over the sea, but inevitably cost more to build and maintain. As he made clear in the *New Scientist* article in January, James Lovelock is not against all renewable energy sources, but he believes they should be assessed objectively, and not assumed to be the answer without any evaluation. His 2006 book contains a very good survey of the various conventional and renewable energy sources currently available, as well as the possibilities of nuclear fusion technology for the future (which he believes is the ultimate answer to our energy needs) and I would recommend this or his new 2009 book if you have not been put off by what you have heard so far. He believes that wave and tidal power schemes are worth pursuing, including a possible Severn Barrage, but it is interesting to note how this project has split the green lobby, some thinking it will be too damaging to the environment.

Both 'renewable energy' and 'sustainable development' have become commonly used phrases in recent years, and perhaps many of us here this morning are generally in favour of them. Lovelock is sceptical of both. He thinks that even sustainable development will not restore health and harmony in Gaia, and our situation is so serious that what is needed is a sustainable retreat. He believes that if we fail to take care of the Earth, it will surely take care of itself by making us no longer welcome. He even puts it in religious terms: "Those with faith should look again at our Earthly home and see it as a holy place, part of God's creation, but something that we have desecrated." Lovelock is much concerned by the growth in human numbers, and says that the root of our problems with the environment comes from a lack of constraint on the growth of population. In 1800 there were only one billion of us. By 1850 1.3 billion, by 1950 2.5 billion and today 6.7 billion. This is projected to rise to 9.2 billion by 2050. It is not very politically correct to talk about population control these days – and generally speaking it doesn't seem to have been very effective, with the possible extreme exception of China - but it is difficult to see how the Earth can cope with such numbers, especially when we cannot feed everyone today. This is why Lovelock says that our only hope in the future is to produce food that is synthesised from easily available elements, rather than grow it on farms.

If Lovelock is seen as something of a maverick, it was interesting to read the views recently of our national treasure Sir David Attenborough. Interviewed by *The Times* in January just before his programme about Charles Darwin on TV, he said: "We are not apart from the natural world, we do not have dominion over it. We are subject to its laws and processes as are all other animals on earth – to which, indeed, we are related". He went on to say that we are flouting the evolutionary rules through our over-exploitation of land and through the

astonishing growth in population, which has trebled since he started making programmes. He concluded: "I am pessimistic. We are plainly being silly. The human race is condemning, by its own behaviour, whole populations to famine. Global warming is going to cause the same sort of thing."

Finally I would like to turn briefly to our present and continuing serious economic situation. In recent years many of our political leaders have started to pay at least lip service to environmental concerns. But as far as I am aware no mainstream politician outside the Green Party is using the recent crisis as an opportunity to say we should review the way we live now, and to argue that our consumer society is unsustainable in the long run. Instead the aim seems to be to get us back to shopping and spending and consuming as soon as possible. No doubt it would be a very brave politician to say otherwise at the present time, with unemployment now rising sharply. But can we change our lives and learn to consume less, and live more simply? Can we learn to share things out more evenly, including perhaps employment? Are we willing to take a drop in our standard of living if that was necessary? I have considerable sympathy with the Slow Movement which was founded in Italy some twenty years ago, initially as a reaction to fast food, and which has now spread to many other countries including Britain. Its aims include supporting local produce and culture, working for a sustainable environment and encouraging healthy living.

Humanity has no divine right to the earth. We have hopefully moved on from Genesis Chapter One, Verse 26, where man was given dominion over the fish of the sea, over the fowl of the air and over all the earth. The earth will surely carry on with, or without us. James Lovelock's position may seem extreme, but as we look round at the state of the world and what we are doing to it, I can't help feeling that he may be right, and that Gaia is starting to take her revenge. Let us hope we can stop her in time.

HH 11/8/09

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