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Ideology, Fundamentalism and Scientific Research

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A member of the House of Lords and a former Treasury Minister

The Enlightenment was the glorious period in our history which laid the foundations of our present civilisation. Science was its main architect, because it challenged the superstitions that dominated life and rejected the authority of the church as the arbiter of truth. Before the Enlightenment Calvin could claim to refute Copernicus with the text: 'The world also is established, that it cannot be moved'¹ adding: 'Who will venture to place the authority of Copernicus above that of the Holy Spirit.' Galileo could be terrorised by the Inquisition into recantation. However, gradually it became accepted that the way to the truth about nature lay not through the Scriptures or the religious interpretation of heavenly portents but through the scientific method, through the freedom to experiment and rely on evidence, not authority. The tyranny of religious dogma was defeated.

Dogma has always been the principal threat to the freedom of scientific research. In the last century the threat to scientific freedom came from ideological rather than religious sources, although local restrictions on research using embryonic stem cells show that the influence of religious dogma has by no means disappeared. However, it was the dictatorships of communism and Nazism that most affected science. In the Soviet Union a rigid ideology that passed for thought among the ruling caste poisoned all science that did not relate to military purposes. Lysenko ruled in biology and under his influence, backed by Stalin, 'bourgeois, class-ridden' genetics was banished and the doctrine of Mendelian inheritance was denounced as 'the ravings of a monk'. Science fared little better under Hitler, who declared: 'We stand at the end of the age of reason. A new era of the magical explanation of the world is rising, an explanation based on will rather than knowledge.'² Science was not proper science if it was practised by Jews. Conventional academic medicine was replaced by herbs, homeopathy, sunshine and fresh air.³ Indeed in some ways the Nazi regime was a distorted kind of green regime, which much favoured the 'Back to Nature' movement and also strongly opposed vivisection. It is an irony of history that the SS were taught to show the deepest respect for animals.

Today it would be wrong to overstate the threat to the freedom of academic research in the developed world. On the whole science flourishes as never before. Yet there are dangerous undercurrents and in some fields powerful anti-science influences not only inhibit research but have caused major harm to the welfare of millions of people. Of these influences eco-fundamentalism is probably the most significant.

Fundamentalism is normally associated with a religion that bases its beliefs and actions on the literal interpretation of a sacred text such as the Bible or the Koran, whose truth cannot be challenged because it is the Word of God. In that sense there are no eco-fundamentalists because there are no sacred ecological texts. Not even Rachel Carson's *'Silent Spring'* has achieved such holy status.⁴ However, some opponents of genetically modified crops have become so passionate in their opposition that no evidence can shake their belief that the crops are harmful to humans and to the environment.

For example during an inquiry by the Science and Technology Committee of the House of Lords into GM crops, the then director of Greenpeace UK, Lord Melchett⁵ was asked: 'Your opposition to the release of GMOs, that is an absolute and definite opposition, not one that is dependent on further scientific research?' Lord Melchett: 'It is a permanent and definite and complete opposition.'⁶ A belief that cannot be affected by evidence has all the characteristics of a religion and the actions of Greenpeace in preventing the cultivation of GM crops have so much in common with an evangelical crusade that its opposition can legitimately be described as fundamentalist. Unlike practical environmentalists, who take account of what is happening and see science and technology as allies, Greenpeace and its allies Friends of the Earth either ignore, or dogmatically contradict the record of GM crops so far. It is worth stating briefly what that record is.

GM crops are now cultivated in 29 countries on over 160 million hectares by 16.7 million farmers, of whom over 15 million are small-scale, resource-poor farmers in developing countries. The 94-fold increase of the area cultivated between 1996 and 2011 is the fastest rate of adoption of any technology in the history of modern agriculture.⁷ The reason for this rapid growth has been its benefits: GM cotton farmers in China and India have seen their income increase and health improve because they have to spray less pesticide. GM crops generally improve yields and reduce the use of chemicals. GM crops have made no-till or low-till agriculture possible and since unploughed land is rich in organic matter and provides food for plants, as well as being rich in earthworms, insects and microbes, the environment and farmers benefit. Further, despite their world-wide adoption over more than a decade, there has been no evidence so far that GM crops cause any harm to human health or to the environment. That has been the clear verdict of every National Academy of Sciences in the world, the Royal Society, the American, German, French, Mexican, Chinese, Brazilian and Indian Academies of Science.⁸ Furthermore

the next generation of GM crops promises to help solve the growing crisis in world food supplies as the human population increases and good agricultural land and water become scarcer. Stress – and disease-resistant new plant varieties are in the pipeline which will not only increase yields but can off-set damage caused by climate change. Why do Greenpeace and Friends of the Earth reject this overwhelming evidence? Because their eco-fundamentalism tells them it cannot be true, just as the Pope's representative is reputed to have refused to look through Galileo's telescope at the newly-discovered moons of Neptune because his religion told him they could not exist.

However, does this eco-fundamentalism actually inhibit or suppress the freedom of research?

First, it does so through blatant violence and intimidation. Nearly every field-trial of a new GM crop in Europe has been trashed by anti-GM campaigners who do not wait to see what the experiments would prove. These vandals are the modern equivalent of book burners, or those who burned witches before it could be established whether they were guilty of the crimes they were accused of. Universities have stopped doing research because of intimidation. Two German universities banned crop trials because they had been damaged by green campaigners. The president of one university said 'We are no longer able to deal with the massive opposition. The university has a reputation which we cannot risk losing.'⁹ It is a strange defence of a university's reputation for academic integrity that it is abandoning research because of blackmail by ideological extremists.

Research is also inhibited because any new GM crop variety that is its product cannot be commercially grown in Europe, and if cultivated in African countries which desperately need the benefits they can bring, cannot be exported to Europe. Ideological green campaigners have stirred up hysteria about GM food with cries of 'Frankenfoods' and have driven GM products off the shelves of supermarkets, not because their proprietors believe the products endanger customers' health, but because they reasonably fear damage to their shops. Several EU countries have banned GM crops altogether. Throughout the EU, imports of soya with more than 0.9 per cent GM content are banned.¹⁰ The result is that agro-businesses have either left the EU or do no research and development in Europe related to GMOs. Some research continues in agricultural research institutes, but it cannot be denied that eco-fundamentalists have suppressed much valuable research into plant science in Europe.

Europe's rich consumers can perhaps afford to ignore the benefits of GM crops, although in time, when more nutritious and cheaper products come on to the market, attitudes will no doubt change, but the harm done in Africa by anti-GM NGOs, especially Greenpeace and Friends of the Earth is incalculable. It has been documented devastatingly in Robert Paarlberg's book, *'Starved for Science – How Biotechnology is being kept out of Africa'*.¹¹ Today there is hope that the vital contribution biotechnology can make to Africa's desperate food

problems will no longer be ignored, because the Gates Foundation is investing in several transgenic staple crops, such as potatoes, sweet potatoes, cassava, millet and sorghum, rice and maize. If introduced, they could boost the low productivity of most African farmers. The Foundation is also supporting local R and D by African biotechnologists. In the past, however, commercial trials of all these crops have been held up by political opposition from governments on advice from NGOs, whose influence in Africa is huge. Governments depend on them, partly because of the good work they do in providing education and healthcare. It is a tragedy that this good work is offset by the influence of eco-fundamentalists who have done everything they can to prevent Africa benefiting from the application of modern science.

Another way in which research is inhibited and suppressed is by the success fundamentalists have had in imposing a system of over-regulation of GM crops that does not apply to equivalent (and often inferior) conventionally-grown crops. It takes many years longer and costs at least ten times as much to bring a new GM crop to market as its conventional equivalent. The history of so-called 'golden rice' is a tragic example. By engineering a bacterial gene together with two daffodil genes into rice to make it synthesise the micronutrient beta – carotene, which when eaten is converted into vitamin A. This GM rice has the capacity to save millions of children in Asia from going blind from vitamin A deficiency, but its introduction has been delayed for many years by the regulatory requirement of a variety of tests designed to guard against every possible hypothetical risk, however remote. Other varieties of rice grown all over Southeast Asia have also been shown to be 'genetically modified', but accidentally as the result of mutations, chromosomal recombinations, translocations of pieces of DNA and even deletions of sections of DNA. These varieties were not required to undergo any laboratory tests imposed on golden rice. As Ingo Potrykus, the chief progenitor of golden rice, has observed, no scientist or scientific institution in the public domain has the funding or motivation to go through the process golden rice has had to go through which also applies to other new GM crops. Only large companies or very rich charities can afford to develop such crops, and large companies inevitably concentrate on those crops for the rich world that promise large profits.¹²

GM crops are a prime example of the way fundamentalists block research but ideological influence has a more general impact on other research and innovation, namely through the precautionary principle. Actively promoted by the greens, this principle has become embedded in several EU protocols and other EU legislation. It seems to be so widely accepted that it has almost become an eleventh commandment: 'Thou shalt not take any unnecessary risk.'

The principle itself is more frequently invoked than defined. There are at least fourteen official definitions, none of them particularly helpful and some positively harmful if put into practice. When analysed they are either so obvious that they do not need stating: ('Where there is serious risk of harm, be careful'),

or so vague as to be meaningless, as in the Cartagena Protocol,¹³ or in a form which counsels caution even when there is no significant scientific evidence of risk. Its most common form is: 'when an activity raises threats of harm, measures should be taken even if some cause and effect relationships are not established scientifically'. In effect this allows public opinion to decide whether an innovation that requires a government licence should be permitted. Fears may be aroused by green campaigns, television programmes, articles or letters in the press and may have no evidence to support them. Public opinion does not always show an understanding of how science works.

The precautionary principle is a major obstacle to innovation because it can be, and has been, invoked by those who seek to frustrate the development of anything of which they disapprove. All they have to show is serious concern about harm. It plays into the hands of scare-mongers. If innovation is affected, so is scientific research. Indeed the reality of the danger to research is underlined by the warning from Carl Djerassi, who developed the contraceptive pill, that in the present climate of widespread suspicion towards science he would never have been able to develop and launch the Pill, with its huge benefits for women's right to choose.¹⁴ Finally, there is another threat, not from fundamentalists, but from scientists themselves. Having looked at the evidence I accept the assessment of the International Panel on Climate Change that there is a more than ninety-five per cent probability that mankind's activities make an important contribution to global warming.¹⁵ I find the objective approach of the report of the scientific committee of the IPCC, which acknowledges areas of uncertainty (they have also admitted some mistakes) very impressive and convincing. I am disturbed that there is a sizable section of the public, not only in the United States, but also in Britain and some other parts of Europe, that is not convinced that there is a serious danger of a significant rise in global temperatures within a relatively few decades. It does not accept that it would be damaging to large areas of the world and would affect all our lives. However, the degree of consensus among climate specialists about what is happening, or likely to happen, should not discourage discussion of the prevailing orthodox view or even dissent. Yet some of the supporters of the majority view are so convinced of its importance that they call for dissent to be suppressed. There is more than a whiff of intolerance in the air.

For example, the *Guardian* columnist George Monbiot celebrated the 'recanting' of the *Sun* and the *Economist* newspapers when they appeared to retreat from their previous somewhat skeptical views about climate change.¹⁶ 'Recanting' was forced on Galileo by the Inquisition. It means a public confession of error in matters of religion. Others frequently compare climate skeptics to holocaust deniers. One enthusiast for conformity, an Oxford academic Mark Lynas, has written: 'I wonder what sentences judges might hand down at future international criminal tribunals on those who will be partially but directly responsible for millions of deaths from starvation, famine and disease

in decades ahead.¹⁷ Skeptics, he argued, would be just as responsible for future deaths as those who were responsible for the holocaust.

In my view this intolerance of dissent is dangerous. Some respected scientists too are among the skeptics. More important, what I as a non-scientist but a politician note and admire about science is that very few issues are ever settled and only when they have withstood every attempt at falsification. Evolution seems to be one exception and no one now argues that the world is flat. Even Relativity Theory has been the object of debate and, I understand, some emendation, but global warming is a complex issue and many aspects of it are still subject to some uncertainty.¹⁸ Continued debate and questioning, even of conclusions for which there is a more than ninety-five per cent likelihood that they are correct, can surely be healthy rather than dangerous.

One of my heroes is the political philosopher John Locke, who can justly be regarded as the father of liberal democracy, not least because of his total opposition to dogma and extremism. He was a great admirer of the experimental approach of science and argued that rational beings should hold their opinions with a measure of doubt. We should be wary of imposing our opinions on others. He wrote:

It would, methinks, become all men to maintain peace, and the common offices of humanity, and friendship, in the diversity of opinions; since we cannot reasonably expect that anyone should readily and obsequiously quit his own opinion, and embrace ours, with a blind resignation to an authority which the understanding of man acknowledges not. ... For where is the man that has incontestable evidence of the truth of all that he holds, or of the falsehood of all he condemns; or can say that he has examined to the bottom all his own or other men's opinions?¹⁹

It is easy to denounce the intolerance of those with whom we disagree when they seek to suppress views that they believe to be dangerous. It is just as important that we are not indifferent to the intolerance of those with whom we may broadly agree and who seek to suppress views with which we also disagree.