

Britain: President of the Royal Society makes outspoken defence of science

Chris Talbot
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Lord Robert May, president of the Royal Society, in his retiring anniversary address (“Threats to Tomorrow’s World”) made a challenge to the modern opponents of science that was remarkable in its frankness.

An eminent figure in the world of science, May did not shrink from highlighting the dangerous refusal of governments—including both the Bush administration and the UK’s Blair government—to seriously begin tackling the problems facing the planet based on the warnings being made by scientists.

May also emphasised the serious impact on the future of science that attacks from religious fundamentalists—particularly the Christian right in the United States—could have. He insisted on defending an attitude to science and society based on the traditions of the seventeenth and eighteenth century Enlightenment, despite the attack on that approach by postmodernist trends in academia.

May strongly defended the achievements of science in the modern era. “Basic understanding of the life sciences,” he pointed out, “especially with respect to infectious diseases, has resulted in average life expectancy at birth on the planet today being 64 years, up from 46 years only 50 years ago; the gap in life expectancy between the developed and developing worlds has correspondingly shrunk from 26 years to a still disgraceful 12.”

Science has enabled mankind to double food production over the past 35 years on only 10 percent more cultivated land. And the average human is able to access a supply of energy each day that is 14 times that required to maintain basic metabolic processes, essentially the amount of energy available to our hunter-gatherer ancestors.

May spelt out the increase in human population that science has made possible: “It took essentially all of human history to reach the first 1 billion people, around 1830; a century more to double that; 40 years to double again to 4 billion around 1970. Today we are 6.5 billion headed, barring catastrophe, to around 9 billion by 2050.”

As chief scientific adviser to the UK government from 1995 to 2000, and as president of the Royal Society for the last five years, May has access to the most up-to-date information. He singled out major problems facing the scientific community: climate change, biological diversity and infectious diseases.

On climate change, he explained that carbon dioxide levels in the earth’s atmosphere were about 280 parts per million (ppm) in the 1780s at the start of the Industrial Revolution, rising to 315 ppm over the next century and a half, then accelerating throughout the twentieth century so that the present level is 380 ppm. Given current trends, the level will reach 500 ppm by 2050. There is now agreement by scientists throughout the world that the average temperature is rising as a consequence. May and the Royal Society initiated the

unprecedented step in June this year of getting a brief statement on the existence of global warming signed by the science academies of all the G8 countries as well as of China, India and Brazil.

May said, “The impacts of global warming are many and serious: sea-level rise...(which comes both from warmer water expanding, and also from ice melting at the poles); changes in availability of fresh water (in a world where human numbers already press hard on available supplies in many countries); and the increasing incidence of ‘extreme events’—floods, droughts, and hurricanes—the serious consequences of which are rising to levels which invite comparison with ‘weapons of mass destruction.’ In particular, recent studies, made before Katrina, suggest that increasing ocean surface temperature (the source of a hurricane’s energy) will have little effect on the frequency of hurricanes, but strong effects on their severity.”

He described measures that could begin to deal with global warming—saving energy usage, capturing carbon dioxide emission, or switching to renewable sources of energy. The latter currently account for only 3 percent of the world’s energy.

“Not surprisingly,” said May, “there exists a climate change ‘denial lobby,’ funded to the tune of tens of millions of dollars by sectors of the hydrocarbon industry, and highly influential in some countries. This lobby has understandable similarities, in attitudes and tactics, to the tobacco lobby that continues to deny smoking causes lung cancer, or the curious lobby denying that HIV causes AIDS. Earlier, when some aspects of the science were less well understood, they denied the existence of evidence that human inputs of carbon dioxide and other greenhouse gases were causing global warming. More recently, there is acknowledgement of anthropogenic [caused by human activity] climate change, albeit expressed evasively, but accompanied by arguments that the effects are relatively insignificant, and/or that we should wait and see, and/or that technology will fix it anyway.”

In the United States, emissions today are 20 percent higher than in 1990, and President George W. Bush’s failure to follow through the cuts in carbon emissions made by his father is “underlined by his failure to even mention climate change, global warming or greenhouse gas in his 2,700 word speech welcoming the new US Energy Act in August 2005.”

The UK is likely to miss its Kyoto target on emissions, with the government failing to deal with rising demand for electricity and transport without burning more fossil fuels.

On the issue of declining biological diversity, May has to admit that our understanding of the consequences is more rudimentary but that it could present an “even greater threat than climate change.” Surveying the evidence for the extinction of species, May concludes that extinction rates in the twentieth century were higher, by a factor of

100 to 1,000, than the rate revealed in the fossil record. He argues that this extinction rate is likely to increase fourfold in the next century as a result of human activity.

The UN-sponsored Millennium Ecosystem Assessment put out a report earlier this year concluding that “approximately 60 percent of the ecosystem services that support life on Earth—such as fresh water, fisheries, air and water regulation, pollinators for crops, along with the regulation of regional climate, pests, and certain kinds of natural hazards—are being degraded and/or used unsustainably.”

The World Summit on Sustainable Development in Johannesburg in 2002 agreed targets for “a significant reduction in the current rate of biodiversity loss by 2010.” May points out that 188 nations signed up apart from 7, the “coalition of the unwilling,” which included the US, Iraq and the Vatican. However, the lack of action on sustainability includes Britain, where 1 percent of Sites of Special Scientific Interest suffer serious damage each year, and the European Union, which continues to allow cod fishing in waters where scientists have urged a complete ban because of over-harvesting.

Infectious diseases are the third global problem facing mankind. Science has undoubtedly made great advances. Pointing to the fact that out of the 130 million children born in the world last year, some 10 million would not survive their first five years, May said, “This is lamentable and avoidable.” However, it bears no comparison to the situation in 1860, for example, when half the children born in Liverpool, England, did not live past the age of five.

But the benefits of medicine are heavily skewed in favour of the West. May points to an analysis of the research papers published in four leading journals. Only one paper in seven deals with problems of the developing world, and most of these are on HIV/AIDS, also a major issue in the West.

May referred to a recent statement by UN Secretary General Kofi Annan concluding that the pace of the AIDS epidemic is accelerating and that proven prevention strategies are only reaching a fraction of those that need them. “This statement is a tactful way of saying that the dissemination and adoption of successful prevention strategies is being seriously hindered by arguments over the role that contraception in the form of condoms should play,” explains May.

The argument against condoms is promoted by the Vatican, and “with added support from fundamentalist groups, these arguments have the effect that aid from the United States for tackling HIV/AIDS seems usually to be tied to promoting abstinence and condemning condom use.”

Finally, turning to the nature of scientific knowledge and the problems of promoting a scientific outlook in the modern age, the anniversary address explains the complexity involved in science that is dealing with the frontiers of knowledge. Climate change, biological diversity and the spread of disease involve serious issues that May describes as “nonlinear.” It is not possible to simply extend present knowledge into the future in a linear way, and there are many uncertainties.

Whilst there are many areas of science that are understood very well—these are the areas traditionally taught in schools—it takes a long time, decades, to acquire the observational data and develop the computer models to overcome the uncertainties that bedevilled areas such as climate change and AIDS research. May advocates the promotion of science education against a simplistic viewpoint, noting that “there are those who seek to deliberately confuse yesterday’s uncertainty with today’s fact-based understanding.”

Moreover, whilst it is true that social values are involved in the

agenda of science, the choice of areas where money is invested into research, May opposes the postmodern view that “[t]aken to extremes...can lead to the view that scientific knowledge is no more than a ‘social construct,’ rather than statements about the external world, which in reality is (in Max Planck’s words) ‘independent of our senses [with its laws] not invented by humans.’”

The anniversary address strongly defends an Enlightenment view against reaction. The Royal Society itself was born of the Enlightenment, and that remains the approach of science: “Everything we do embodies that spirit: a fact-based, questioning, analytic approach to understanding the world and humankind’s place in it. Nullius in Verba.” [“On the words of no one,” or alternatively, “In the words of no master”—the Royal Society’s motto.]

On balance, such values have, says May, “in the words of that splendidly archetypal document of the Enlightenment, the American Constitution, enhanced life, liberty, and the pursuit of happiness.”

Science and the Enlightenment view are under a serious ideological onslaught. In the US, a recent survey showed that 37 percent wanted creationism taught in schools. “In the US, the aim of a growing network of fundamentalist foundations and lobby groups reaches well beyond ‘equal time’ for creationism, or its disguised variant ‘intelligent design,’ in the science classroom. Rather, the ultimate aim is the overthrow of ‘scientific materialism’ in all its manifestations.”

May cites a number of recent articles pointing to the danger of fundamentalist attacks on science, and is clearly concerned at the spread of such views and their impact on governments. Whilst he refrains from criticising the religious views of Prime Minister Tony Blair, he points to a remark of a senior adviser to Bush that was quoted in the *New York Times* (Oct. 17, 2004) who said that there is “what we call the reality-based community...[who] believe that solutions emerge from judicious study of discernable reality, [but] that’s not the way the world really works anymore. We’re an empire now, and when we act, we create our own reality.”

May’s outspoken address expresses the concern for the future of mankind and the ecosystem of the planet that is held by thousands of scientists. Whilst he, as would be expected, has illusions that the policies being pursued by national governments and multinational corporations can be curbed by international agreements like that signed at Kyoto, the conclusions that can be drawn from his view of science and the warnings that he makes point in the opposite direction. The science-based, rational and democratic management of the earth’s resources is incompatible with the current political system based on capitalist profit and the nation state.



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