



Lord Robert May urges scientists to treat politicians as having high ideals and genuine commitment to public service. Photo: Peter Pockley

Questions of Trust

The annual Science Meets Parliament day, organised in November by the Federation of Australian Scientific and Technological Societies, was the most comprehensive to date. The 154 scientists, who lobbied politicians in pairs, displayed an increasing maturity in dealing with the political “process”.

No speaker had more clout than Lord Robert May, the expatriate Australian who was the UK's Chief Science Adviser to both Conservative and Labour governments for 5 years, and is now President of the Royal Society of London. With characteristic force, the former physics professor in the University of Sydney stressed the central importance for scientists to generate a sense of trust in their expert advice among all levels of government.

Serious questioning of “public trust” has become an abiding concern among the scientific community in the UK and Europe following controversies over the handling of “mad cow” and foot-and-mouth diseases in farm animals, and of genetically modify food crops. Australian scientists are far from immune to the syndrome.

Trust also needs to run in the other direction – among scientists about the motives of politicians. May showed how sensitive this can be when he jumped on political advisers to a Cabinet minister and a Labor shadow for telling scientists that they should capitalise on the local interests of politicians.

May urged Australian scientists not to approach politicians with the suspicion that they are primarily motivated to secure re-election. Rather, scientists should recognise politicians' dedication to broad national goals and public duty if they are to gain greater attention and respect.

May referred to the *Code of Practice for Scientific Advisory Committees* developed in the UK, which stresses the principle of openness and publication of advice tendered to government.



Scientists march from Old Parliament House to the big House on the Hill to lobby politicians. Photo: Peter Pockley

It appears the Australian government ignored this principle in handling Cabinet's decisions on National Research Priorities, which was due for release after *Australasian Science* went to press. In the final crucial stage, the eminent scientists on the “Expert Committee” – who collated summaries from open, consultative panels and then identified themes for consideration by Cabinet – were sworn to secrecy. The “process” became opaque and the scientists were politically locked into whatever Cabinet decided.

Ethical Pledge

At the recent NZ conference on Microbes and Molecules I suggested that scientists, both individually and as a community, should publicly pledge to maintain the highest ethical principles throughout their careers. While elements of the wider public query the motives and ethics of researchers, the time for such a declaration has surely come. We should start by motivating ideals among young scientists.

Although Australians have been relatively unfazed by the controversies elsewhere over genetic modification, debates rage over stem cell research and the disposal of nuclear waste from the replacement research reactor. More urgently, scientists cannot escape the scepticism generated at times of undeclared war when massive investment in physical, chemical and biological technologies that inflict death is justified to protect the “national interest” and political and religious ideologies.

The notion of a pledge – reflective of the Hippocratic ideal for medicos – is not new. I first heard one proposed by nuclear physicist and Pugwash leader, Sir Joseph Rotblat, as opening speaker at the UNESCO World Conference on Science in Budapest in 1999:

I promise to work for a better world, where science and technology are used in socially responsible ways. I will not use my education for any purpose intended to harm human beings or the environment. Throughout my

career, I will consider the ethical implications of my work before I take action. While the demands placed on me may be great, I sign this declaration because I recognise that individual responsibility is the first step on the path to peace.

At the recent international forum on coral reefs (pp.29–32) I learned of marine biologist Prof Joan Roughgarden's (Stanford University, USA) “Biotechnologist's Oath of Professional Ethics” (at press in *Evolution's Rainbow*, Princeton University). She wants the following taken on admission to Masters and PhD degrees in biotechnology, molecular biology, biochemistry and genetic engineering:

I promise to protect the human gene pool. I promise to use biotechnology for peace.

Many scientists would have no difficulty in agreeing – and in foreswearing destructive uses of research – but they seldom extol such sentiments. Instigating a debate about the merits of a pledge and constructing a simple, direct form of words would be a visible sign that scientists embrace social responsibility.

Sulphur and Arsenic Block HIV from Entering Cells

Research at the University of NSW has uncovered a novel and potentially powerful approach to stopping HIV viruses from entering cells where they would multiply with lethal consequences.

The fundamental science of proteins that lies behind this discovery is a fascinating example of the burgeoning power of modern molecular analysis. Last month Prof Philip Hogg told the Microbes & Molecules conference in Christchurch, New Zealand, that many proteins contain a disulphide bond that can sometimes control how a protein works by breaking and reforming in a precise way.

While antiviral therapy with a cocktail of drugs has slowed the replication of HIV once inside cells, these treatments are essentially palliative and, for all but a fortunate few, only postpone a nasty end to life. What is urgently required, according to Hogg, is “a way to stop the virus getting into cells in the first place”.

Along with many other research groups, the Centre for Vascular Research at UNSW has focused attention on a receptor on infection-fighting T cells that permits entry of the virus. This CD4 receptor acts as the gateway for viruses entering cells. Hogg & Co have shown that the CD4 molecule can exist in different three-dimensional forms because of an unusual disulphide bond (two adjacent sulphur atoms), and that the virus prefers one form over another.

CSIRO in Limbo

Confirmation of analyses in *Australasian Science* since July that queried the grand plans for CSIRO by Chief Executive, Dr Geoff Garrett, came in spades with the organisation's Annual Report for 2001–02. In the first year since announcing he would “grow CSIRO's business” by a whopping \$500 million in 5 years, earnings from the private sector went backwards in real terms and were 16% less than 4 years earlier.

In Senate Estimates (*Hansard*, 21 November), Garrett nearly came a total cropper. After denying four times to Labor's Kim Carr the existence of the September 2001 report by Allen Consulting (AS, October 2002, pp.38–39), which threw grave doubt on Garrett's “stretch target”, he was rescued by minders but downplayed its significance.

Critical features in *The Age* and *Sydney Morning Herald*, with credit to *Australasian Science* for starting the debate, and 20 questions on notice from Carr have added pressure.



Prof Philip Hogg is attacking HIV/AIDS with sulphur and arsenic. Photo: Justine Frost, UNSW

After gaining a detailed picture of how the CD4 molecule can change shape, Hogg realised that this shape change could be prevented by using a “designer compound” consisting of a peptide (a fragment of protein) and an arsenic atom.

He described in *Nature Immunology* (August 2002) how a designer compound called GSAO stops CD4 from changing shape, an effect that prevents HIV from entering T cells. As GSAO is non-toxic in laboratory mice, it opens a path to new drugs for fighting HIV/AIDS.