

Science must demonstrate its worth

AUSTRALIAN ACADEMIC PROFESSOR ROBERT McCREDIE – NOW LORD MAY OF OXFORD – WAS CHIEF SCIENTIFIC ADVISER TO THE UK GOVERNMENT DURING THE ‘MAD COW’ DISEASE CRISIS AND AT THE HEIGHT OF THE ANTI-GM PROTESTS. IN THIS EDITED EXTRACT FROM A TALK GIVEN AT THE UNIVERSITY OF SYDNEY, HE OFFERS SOME THOUGHTFUL INSIGHTS INTO THE CLASH BETWEEN AGRICULTURAL SCIENCE AND URBAN COMMUNITIES.

Scientific advance has made most people's lives in the developing world, and the developed world, better. But at the same time, those same well-intentioned applications of our understanding are having unintended adverse consequences – unsustainable population growth and all that flows from it, such as climate change and diminution of biological diversity.

Our knowledge is now also reaching down to an understanding of the molecular machinery of life itself, so we need to do a better job of deciding what kind of world we want to build with this understanding rather than, as in the past, just letting one thing happen after another.

This requires a better dialogue between science and society. One measure of our success in applying knowledge is to make life better.

In developed countries food has never been more abundant nor more varied – however, 100 years ago, we spent a calorie of energy to put a calorie on the table. Today we spend 10 calories to put a calorie on the table.

Hunter-gatherer societies spend about a tenth of a calorie to put a calorie of food in their mouths. Present practices are not sustainable.

Nonetheless, modern agriculture has doubled the global output of food over the past 35 years when world population has increased by about 60 per cent. We also achieved this with only 10 per cent more land.

However, this production achievement comes from using seven times the amount of nitrogen fertiliser, and roughly the same for phosphorus.

So, in a statistic that encapsulates the singularity of our time more tellingly than any other, more than half the atoms of nitrogen that are incorporated into green plant material and more than half the atoms of phosphorus annually incorporated come from human activities and fossil fuel energy-subsidised fertilisers – not from the natural biochemical processes that built our world.

It is in this sense that long-term sustainability is more worrying as an issue than for any previous generation. It is not surprising that we live in societies that seem to be more neurotic and febrile, and more inclined to be worrying about the world, than ever before.

Also, the crops we eat now need well-trained experts to recognise them in relation to their wild relatives. Most of us would not see any kinship after 10,000 years of genetic modification, which we see as natural because we have already done it.

Similarly, the new techniques which we have today will seem natural as they become more embedded in common practice.

The mistake in the early development of GM foods has been that the first wave of commercial products were oriented to the producer, not the consumer.

The public hears different worries being raised.

They hear Greenpeace say this is the end of the world and they think “well, Greenpeace would say that”. And they hear the government say that while there are some things to worry about they are much the same as for ordinary foods, and people think “well they would say that, wouldn't they?” So, in short, people react sensibly.

Meanwhile people do not have to make any difficult choices because there are, as yet, no GM foods offering clear consumer benefits.

When we have allergy-free nuts produced by GM techniques, or when we have the ‘right’ cholesterol in selected foods, when we have created the golden apple that, once eaten, makes you thin and witty – then indeed the public will confront the issue in a considered way.

If you ask people, as recent polls have done in Britain, what they think about science and scientists you find that 84 per cent of people say that science makes our life better. Three-quarters of them say that it is the aim of scientists, engineers and technologists to make our lives better. So the attitudes of people towards science is positive.

On the other hand, more than half the people interviewed said the pace of scientific advance was too fast for government to keep up with effective regulation. So it is not the science in itself but the oversight of it, and the wise, sensible and precautionary use of it.

Also it is very awkward to listen to a babble of voices. When you let all voices be heard, many will be bringing particular backgrounds and interests, and for many of them the particular issue will be a metaphor for some larger ideological agenda.

Or it can be an excuse or a peg to hang a membership drive on. So be it. The babble of voices, conflicting opinion, is the way science itself works, and for all its inconvenience it is a good recipe.

These debates, agonising as they may seem in our time, are, however, trivial rehearsals for the difficulties that are going to come.

Most of the unintentional consequences of well-intentioned action that we wrestle with today come from situations where we change the external world. But tomorrow, as we learn more and more about the machinery of life itself and how living things construct themselves, we are going to have the power to change ourselves.

That is going to raise questions about the way the world is, about safety and ethical issues, that are going to make the worries of today look like shadows on the wall.

The things we are doing today, and the way we are trying to handle these debates better, are but practice for a more difficult tomorrow.

Shadows on the wall: anti-GM foods activists stage a protest march in Cape Town, South Africa.

