Science for society

There was a time—not so long ago—when science was the exclusive domain of scientists. But then came the atom bomb, the Chernobyl nuclear disaster and the debate about genetically modified organisms (GMOs), and the man on the street realized that scientific and technological progress increasingly affects his life—and not always positively. Accordingly—and justifiably—non-scientists began to demand that scientists revealed more about what they actually do. And as scientists needed more money for their work, this was also in their interests. It allowed them to try to change the image of science from one of self-indulgent studies of minutiae to a commitment both to advance knowledge and to bring benefits to the general public.

After some initial resistance, scientists devised various ways to explain how their work benefits society despite the inevitable risks inherent to technological progress. 'Science AND society' quickly became shorthand for describing these exercises in building bridges. Unfortunately for many scientists, this was a one-way street and often resulted in a condescending education of the unlearned by the expert. In addition, many scientists were—and still are—incapable of adopting a language that is understandable to the non-expert. A strange form of mumbo-jumbo, full of subordinate clauses to qualify each word, resulted. This was unsatisfactory for both parties. Often, the prime concern of scientists was not whether the public could understand them, but what their peers would think. A related problem was resentment against those who successfully communicated science on TV or in newspapers. There was, and still is, a suspicion that it is not possible to be a rigorous scientist and to present research clearly. This is not helped by the media, who often ignore a scientific story if the researcher does not claim that "This could be a cure for cancer!"

Today, 'science and society' is still with us, but is being revised and reinterpreted. Events such as the 1998 Swiss national

referendum to limit genetic engineering showed that communication should not be based on presumptions of total ignorance on the part of the public, but must be a real dialogue between different perspectives. In addition, the realization settled in that scientists are also part of society and that frequently their concerns are exactly in line with what society worries about. It was no longer acceptable for scientists to do what they liked and for society to be informed but not involved in their decisions.

In the past decade, other changes have taken place that have undermined authoritative voices in all spheres of life and that now require a different approach by scientists. Non-governmental organizations and the environmental movement turned their focus away from nuclear energy towards the life sciences and the potential risks for the environment. Crass capitalistic attitudes led to the attempt to introduce GMOs surreptitiously. Their reasoned defence of the technology made scientists in this field, and by extrapolation all scientists, suddenly appear to be in the pockets of industry. It was a bad outcome and signalled the need for a new strategy.

The changes that are taking place now are the result of this mutual recognition that the old ways are no longer good enough. Society might have concerns about science and its applications, but also it expects science to provide solutions to its needs and problems. Governments recognize that future economic wellbeing depends on scientists for creating new jobs in high-tech industries. And scientists have learned that progress is not possible in a hostile environment in which funding is stopped or reduced for political reasons, particularly now that research costs are on the rise.

One way to describe this new understanding would be the phrase 'science IN society', to stress that scientists need to understand and integrate into the world outside the laboratory. The number of individuals capable of succeeding in both spheres—a much prized skill—is slowly rising. The

other way to look at the interplay between the practitioners and the public is to focus on 'science FOR society'. There are some consequences to such an understanding. First, society should define what it needs from science. Then, science should say whether and how it can meet these needs. Finally, both sides should discuss and agree on an agenda to achieve these goals.

This might be a tall order, but at least it would be a democratic process to ensure mutual trust and understanding. What would society say it really wanted: secure supplies of energy? Food for all? Cures for which diseases? A better understanding of the universe? There could be a long list of challenging questions and some equally challenging consequences: would nuclear power, embryonic stem cells or GMOs be needed and acceptable to achieve these goals? The ensuing debate might lead to a shift in priorities, for example, to identify novel energy sources. It might put a higher value on research to generate knowledge, but also might indicate what percentage of efforts should be invested in that activity. It might tell politicians that people do not want excessive investments in security but would prefer a cure for senile dementia. Or it might show that, whereas interplanetary exploration makes for good TV, a programme to develop vaccines for AIDS, avian flu or tuberculosis would be a better way to spend research money.

Structuring such a dialogue would be a major challenge—not only for scientists—and would inevitably require the participation of those entrusted with formulating, funding and delivering science policy. It would also move science to the top of the political agenda. In this context, it is worth remembering that the opposite of 'science for society' is 'society against science'. With the passions raised by the GMO debate, we have come close to this recently. We should ensure that it does not happen again.

Frank Gannon

doi:10.1038/sj.embor.7400716