Organic movement reveals a shift in the social position of science

Since BSE, the public is less inclined to trust experts.

Sir — Anthony Trewavas will have ruffled a few green feathers in his Commentary "Urban myths of organic farming" (*Nature* **410,** 409–410; 2001), in which he discusses the myths of organic agriculture. Many of the points he raises are valid, and will be accepted by many (though not all) adherents of organic farming.

Trewavas takes a highly positivistic attitude towards science, in contrast to most of the organic movement. In the positivistic world, something is true if established by the falsification of a null hypothesis. By contrast, many supporters of organic agriculture doubt that an objective, proven scientific truth can exist. They believe an agricultural system is more than the sum of its parts, that the reductionistic view widely used in natural science does not see the big picture, and hence that it fails as a political or social tool of analysis. Organic farming, of course, has a strong social and political agenda.

Take, for example, food quality. Trewavas states that "hundreds of rigorous tests have failed to reveal better-tasting properties or improved nutritional value, but have consistently shown that organic produce has lower nitrate and protein content". The literature he cites, however, raises the point that a lot of food-quality studies concerning the impact of different growing methods lack standards for important parameters such as varieties, growing locations, maturity and storage conditions. These have important effects on compounds influencing the taste and nutritional value of fruit and vegetables.

In addition, only a few studies were performed for certain food groups, leaving the effects of organic or non-organic growing conditions unclear. Furthermore, people are not necessarily buying organic produce because they are unaware of any drawbacks. They may have other reasons which the researchers do not appreciate.

Because the positivistic point of view doubts what has not been 'proved', it will automatically be sceptical towards non-rigorous, anecdotal reported differences between organically and conventionally produced food. On the other hand, many supporters of organic agriculture rely on personal experiences and beliefs that make them more receptive to the idea that there is a difference between organic and conventionally produced food.

In essence, Trewavas is using organic agriculture as a case study of the tendency in modern western society for scepticism about science. Although, as scientists, we may deplore the fact that people are swayed by non-scientific views, the fact is that a lot of them are. Despite the arguments presented by Trewavas, many people believe that organic production systems produce better food, care more for animal welfare and are kinder to the environment. As inquisitive scientists, we should be asking why this is the case.

We should try not to see organic farming in "is it true?" black-and-white terms, but rather look at the social factors leading people to chose organic products. The role of science here is to assist social dialogue rather than simply to deliver the technical 'truth'. For instance, scientists could identify agricultural and environmental conditions under which organic farming might usefully be practised, and those in which it would not be beneficial.

In the era of BSE and of GM foods, we cannot escape the conclusion that the social position of science is changing. The crucial question is whether dialogue is possible between strict rationalists and those scientists more able to see their subject in a broad social context. That is the wider issue highlighted by Trewavas, and the one that needs to be considered by the whole scientific community.

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Politics defeats science at environment agency

Sir — Legislation intended to "boost science" at the US Environmental Protection Agency (EPA) — which was discussed in your News story "Congress hears plan to boost science at environment agency" (*Nature* **411,** 405; 2001) — is being aimed at the wrong target.

The agency's new deputy head would primarily be responsible for "coordinating the EPA's research portfolio", but its management of research, while dismal, is less a problem than its regulatory programmes, where policies seem determined more by environmental politics than environmental science.

Adherence to scientific principles in the formulation of policy has for a long time been alien to the EPA's corporate culture. An analysis by Resources for the Future, a Washington DC-based environmental think tank (M. R. Powell *Science at EPA*. Resources for the Future, Washington DC, 1999), concluded after an investigation of eight major programmes: "EPA for a variety of reasons is unwilling, unable, and unequipped to address and acknowledge the uncertainties in the underlying science."

This analysis echoes the conclusions of an expert panel that was commissioned ten years ago by William Reilly, then EPA administrator (*Safeguarding the Future: Credible Science, Credible Decisions*. The Report of the Expert Panel on the Role of Science at EPA. EPA document 600/9-91/050, March 1992)

Fixing the EPA will require far more sweeping and fundamental changes than those currently being proposed. These could range from the creation of an ombudsman panel with the power to impose sanctions on EPA officials who are responsible for unscientific and flawed policies, to dismantling the EPA and redistributing its few essential functions to less scientifically challenged agencies.

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Cooperation among labs is appreciated

Sir — I would like to clarify my earlier Correspondence ("Patent dispute hangs over kringle 5", *Nature* **407,** 128; 2000) about a patent dispute over an angiogenesis inhibitor involving my laboratory and Abbott laboratories.

My laboratory did not contact Miguel Llinás of Carnegie-Mellon University about supplying kringle-containing plasminogen fragments until some months after our angiostatin paper appeared (*Cell* **79,** 315–328; 1994) in October 1994.

Llinás and Johann Schaller of the University of Bern, who have done pioneering work on the biophysical and functional characteristics of the kringle domains of plasminogen, subsequently were very helpful in supplying samples of fragments from human plasminogen to Yihai Cao in my laboratory.

Cao later published two papers on his results, including Llinás and Schaller as authors because of their help in supplying plasminogen fragments and advice.

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