

## Referendum's challenge to transgenic research

**The Swiss have embarked on a national debate about the use of transgenic animals, threatening devastation of biological science and industry in their country. Are they a barometer of wider public antipathy?**

Like remote shopping, direct digital democracy has long been heralded as a natural consequence of the information revolution. If that is the case, a forthcoming referendum in Switzerland highlights the potential challenge to science. Next spring, the Swiss people will vote at the conclusion of what in effect will have been a national consensus conference on the use of transgenic animals. In other words, a massive and uniquely stark experiment in the public understanding of science is under way.

Transgenic research can be distressing. A historic example was a mouse whose genome was manipulated to give it cancer. The actual and potential benefits of such research are obvious, and there is no substitute for that approach in understanding many genetic influences and fundamental mechanisms, as a major prize awarded this week recognizes (see page 112). But so what, if you believe that it is simply wrong to create animals in the expectation that, inadvertently or deliberately, they will be diseased or defective?

In most countries, people who act on such views are a small minority. But the instinct runs far more widely. Raiding laboratories and threatening scientists' relatives (as has recently happened in the United Kingdom) is more than most objectors could stomach. In Switzerland, in contrast, a mark on a sheet of paper is all that will be required of citizens wishing to exert their influence. The signs are that the majority's inclination is to ban, partly because of uncertainties about the safety and practical implications of the technology, partly for moral reasons. The Swiss Labour party has already adopted a ban as its policy.

There is nothing unique in this referendum in a Swiss context — amendments to the constitution are voted upon three or even more times a year. One can expect a full discussion of the issues in media that are generally considered unbiased even by the activists, while Swiss scientists are organizing a week of open access

to their laboratories in November.

Such visits should boost public confidence that all means of preserving biosafety are being adopted — the Swiss have tight regulations and a good safety record. Scientists, being given media training on request, and having been briefed by an internet network of information, will have ample opportunity to discuss the issues with the public, will rightly highlight the enthusiasm of young scientists and the potential collapse of fundamental biology in Switzerland, and will point to positive benefits energetically pursued in other countries. Industry will spell out the consequences of a ban on giants such as Novartis and Roche — which will simply pack their bags and move to neighbouring territories if the ban is voted for.

Swiss researchers appear to be responding to their predicament in an exemplary manner, but these are morally sensitive issues: feelings could run high and issues may well become distorted. And if the Swiss, as fully aware and educated as is practicable, decide against, they will have made a remarkable moral decision that will encourage other opponents.

Does referendum politics more directly allow a populace to express its fundamental morality in full knowledge of the cost? If so, a Swiss ban on transgenic research would suggest that the Swiss are different from most people, or that much biological research persists only through the unwillingness of most democracies to allow the populace to express its views on specific moral concerns. But perhaps referenda amplify the potential for quirkiness and emotiveness at the expense of tough-minded national ambition. In that case, the Swiss will merely have demonstrated that referenda are a bad way to do business if a country wants to participate in a complex and competitive world. Either way, a ban would be a sorry day for Switzerland. □

## Quantity is not enough

**Japan's scientifically weaker neighbours are outperforming it in the pursuit of quality.**

There is growing realization in the scientifically expanding Asia-Pacific region of the need to improve quality through processes of research assessment (see page 114). But Japan, despite its large output, is lagging behind — most of its neighbours are far ahead in the use of external review committees and bibliographic analysis. With Japan's science-related ministries about to undergo major restructuring and with a government squeeze on money for science after a few years of largesse, the time is ripe to introduce mechanisms to target money where it will be most productive.

Under an absurdly over-democratic system, noncompetitive research funds are spread too widely and too thinly by Japan's education ministry, using formulae based on the number of faculty members in each department regardless of their productivity. One

benefit that should emerge from the recently proposed merger of the ministry with the Science and Technology Agency (STA) (see *Nature* 388, 815; 1997) is greater application of research assessment in the dispersal of noncompetitive funds to universities. The agency has been championing that approach — the ministry and the universities have not.

But the problems are by no means confined to universities. The STA — not to mention other ministries — has been pouring billions of yen into inefficient, grossly mismanaged and scandal-prone research and development organizations. Such scandals are at long last forcing the science-related ministries to be more accountable for the way they spend taxpayers' money. Yet more is needed. Japan needs to learn from its neighbours, as well as the West, in order to make better use of its money. □