

## The difference between science and dogma

**Scientists and science teachers can draw useful lessons from the Kansas Board of Education's efforts to expel Charles Darwin from the state's schools.**

In removing the teaching of evolution, as well as aspects of cosmology, from its curriculum guidance for school students, the Kansas Board of Education has done no favours to the schoolchildren of Kansas or to the national and international reputation of their state. It is to be hoped that the county boards that actually administer education in Kansas will ignore the board's guidelines, and that science teachers there will continue to appraise students of the nature of our Universe to the best of their ability — even if some of this knowledge is no longer to be tested in exams. The board may, however, have done the scientific community a small favour in the long run, if the right lessons are drawn from its decision.

The decision is the latest episode in a protracted effort by creationists in the United States to restrict discussion of evolution in the classroom. After attempts to ban the teaching of evolution outright were blocked in the courts, and efforts to encourage the teaching of 'creation science' met with equally limited success, they now seek to gently remove evolution from school curricula. The Kansas board has chosen to modify a set of school science teaching guidelines, proposed to it by a panel of science educators, by deleting almost two pages that refer to the theory of evolution. References to the Big Bang are also excised from the document.

It would be easy to mock the creationist idea, as some Americans have wasted no time in doing, or to highlight the weakness of the school board's apparent view that phenomena occur only if they can be directly observed. It is also all too easy to bemoan the polling data suggesting that the US public supports the creationist point of view — although one study suggests that US scientists feel the same way (*Nature* 386, 435; 1997). A more constructive response for scientists and science teachers is to ask themselves what they should be doing to keep the sentiment expressed in Kansas from getting out of hand.

## No time to hide

**Britain is right to reject shrouding field trials of genetically modified crops in secrecy.**

The UK government took a brave step earlier this week when it decided to make known publicly the precise locations of four new trial sites for tests of genetically modified (GM) crops, despite the increasing numbers of attacks on such sites by environmental activists. The four farm-scale trials of GM oilseed rape will begin this autumn at sites in Lincolnshire, Nottinghamshire and Hertfordshire, and will bring the total number of test sites to 75 next year.

The announcement, from the Department of the Environment, Transport and the Regions, quickly came under fire from farmers and commercial groups, who argued that it was an open invitation to protesters to destroy the trials (significantly, groups such as Greenpeace have declined to promise not to take such action). The British Plant Breeders Association, for example, says that it had recommended to the government that only the counties in which the trials were being held should be revealed, as is the practice in Germany and France.

One obvious course of action is for scientists to take a more active role in public life. This advice has been repeated to the point of tedium by Neal Lane, former head of the National Science Foundation and now President Bill Clinton's science adviser, and others. It has been repeated again this week by the American Geophysical Union (see page 701).

Another lesson to be gleaned from this episode is the omnipresent danger inherent in the teaching or presentation of science as a set of facts, to be learned by rote, rather than an, as it were, evolving body of knowledge. The National Academy of Sciences, in developing its own guidelines for school science in the United States, has consistently demanded a far greater emphasis on the scientific method itself.

If more children were taught science as a means of interrogating nature, rather than as a toolbox of rules, the 'debate' between creationism and Darwinism would come to be seen in a clearer light. Darwin's theory will continue to be attacked and will develop on the strength of new information established by geneticists, palaeontologists and others. The idea of divine creation is unlikely to benefit from such further investigation because it is not a scientific theory, but a dogma.

Phillip Johnson, a professor of law at the University of California at Berkeley and the author of *Darwin on Trial*, told *The New York Times* last week that the defence of evolution was becoming "the science educators' Vietnam". But the enlightenment is not going to be extinguished anytime soon. A better parallel would be with the Kansas skirmishes that preceded the American Civil War, when pro-slave factions from Missouri and the South sought to rout anti-slave Yankees from their settlement at Lawrence, now home to the University of Kansas. The initial rout was thoroughly successful, but, for a variety of reasons, the outcome of the wider conflict was never seriously in doubt. □

But given that the issues at stake in the conflict over GM crops are as much to do with trust in public institutions as they are with rational action — or even scientific data — the government's decision in favour of openness must be applauded. The nuclear industry has already suffered the consequences of combining rigid secrecy with overstated claims to safety; the one can all too easily feed on the other, and attempts to break this particular vicious circle are therefore welcome.

They are also timely. In a week that has seen the company Monsanto heavily criticized by the UK Advertising Standards Authority for exaggerating some claims about the safety of its products in a public relations blitz in Britain last summer, the need to restore public credibility in the whole handling of the GM issue remains high on the political agenda (see page 702). Openness will not achieve this on its own. But the alternative is doomed to fail. □