facturers separate leaves and stems, extract the nicotine, pulverise the plant products and flatten them into sheets that are rolled into a cigarette. The extracted nicotine is sprayed onto the sheets of tobacco.

It is Dr Kessler's contention that some manufacturers deliberately increase the nicotine concentration to increase the likelihood that smokers will become addicted. The FDA's antismoking gambit, which Dr Kessler hopes will be debated at congressional hearings, comes at a time when the United States is well on its way to becoming a nearly smoke-free society.

Smoking is prohibited on most commercial airlines, including those flying coast-to-coast. More and more office buildings are restricting smoking. As a result, die-hard smokers are forced outside where they can be seen in rain and cold, huddling by the doorway.

It is now common that formal restaurants to have no-smoking sections. And this month, McDonald's (home to the ubiquitous Big Mac) banned smoking, while the National Council of Chain Restaurants declared its support for pending legislation, (introduced by Representative Henry Waxman (Democrat-California), to prohibit smoking in virtually all public places.

Much is being written these days about the tragedy of young people taking up smoking as older generations quit or die. A public ban would certainly send a strong message.

This antismoking fervour, which originates from the correct presumption that smoking is generally bad for smokers' health, is now ignited by the less conclusively proven hypothesis that so-called secondary or environmental smoke is a serious health hazard. For instance, a recent literature survey in *JAMA* (**271**, 612–617) reported an association between negative findings and research support from the tobacco industry whereas independent reports tend to confirm a link between environmental smoke and respiratory, cardiovascular and other ailments in nonsmokers. However, this does not confirm the scientific rigor of the data. Meanwhile, challenges to the Environmental Protection Agency's conclusions about the extent of danger from environmental smoke have yet to be resolved.

Nevertheless, it is hard to argue in favour of tobacco addiction. Unlike alcohol (society's other sanctioned yet often addictive drug), which may provide some protection to the cardiovascular system and is relaxing in moderation, there is no case to be made that smoking confers any benefits.

By even suggesting that cigarettes could be regulated by the FDA as an addictive drug, Commissioner Kessler has raised the ante in the long-standing impasse between the medical establishment and the powerful, wealthy tobacco industry whose contributions to congressional campaigns have earned it the loyalty of members of both the House and Senate. Certainly one of the US government's great contradictions is that it adjures against smoking on the one hand while subsidizing tobacco growers on the other. If the FDA can force a showdown on this issue, so much the better. □

Animals in research

Tufts vets seek a middle ground between researchers and those who oppose using animals in science.

THE numbers of animals used in research, both in the United States and Europe, has declined significantly during the past decade — a fact that should hearten those who are concerned about the welfare of animals. According to "the animal research controversy," a comprehensive report from the Center for Animals and Public Policy at the Tufts University School of Veterinary Medicine in Massachusetts, the numbers have been falling since the 1970s, particularly in Great Britain and Europe where good data indicate a decline in the range of 20 per cent to 50 per cent. British researchers, for example, used some 3 million animals in 1992, down from 6 million in 1975. Data on the numbers of animals used in the United States are less accurate, but a good guess is an overall decrease of about 25 per cent since 1985.

But statistics alone will do little to quell the acrimonious debate about the morality (or even necessity) of using animals as surrogates in the study of human biology. Examples of diseases that can be treated because of animal studies are valid but not convincing to activists. The debate really hinges on issues such as the relative value to human beings of inflicting pain and distress on animals in order to gain data, or personal views about the cognitive lives of dogs, cats, and other species used in science. "Laboratory animal research causes less pain and distress than implied by animal protection literature but more animal pain and distress than claimed by research advocates," said Franklin Loew, dean of Tufts and a coauthor of the study. Loew also aptly noted that people on either side of the issue tend to mischaracterize their opponents ("scientists as sadists," for instance, or animal rights activists as "emotional fanatics".

Is there a solution? First, it can be said that there is nothing substantially new in the debate that has been going on for a century. It is true that it is now possible to obtain certain kinds of information (toxicity data, for instance) from alternative test systems like bacteria. But that does not go to the heart of the matter which is the value of animal life over the lives and health of human beings.

The Tufts group has hopefully called for the creation of an officially sanctioned forum, where both sides could come together. But in an arena characterized by *ad hominem* verbal attacks and even criminal violence, it is hard to imagine negotiated conflict resolution around a table in Washington or London. The most adamant critics and defenders of animal research show no signs of wanting to compromise. Nevertheless, there are indications that some groups are willing to talk. Loew has done a service by acknowledging that animal experimentation can be painful. In return, representatives of the Humane Society of the United States have called the idea of a forum "a good thing". That in itself is progress. □