

Of course there are reasons for social concern over the use of marijuana—just as there are reasons for social concern over the use of aspirin and butter, not to mention alcohol and tobacco. If we confuse the issue of whether an individual should use a substance with that of whether society should forbid his doing so, we may be laying the foundation for tragic errors in public policy.

Reliance upon the criminal law to control marijuana is, in terms of cost-effectiveness, a very bad policy—even though it sounds tough and hardheaded. There are several reasons for this.

1) Marijuana use, compared to many things which are freely tolerated in our society, is not *that* much of a cause for concern. For instance, not only is it clear that the percentage of users harming themselves with marijuana is much less than the equivalent percentage of those using alcohol, but, with respect to the driving of automobiles, studies indicate that the driver who is socially intoxicated on marijuana is very little, if any, more dangerous at the wheel than the nonintoxicated driver (as opposed to a vastly larger effect with alcohol). Indeed, this follows from the fact that it is so difficult to tell whether someone is under the influence of marijuana.

2) The criminal law does not really have a great effect in discouraging marijuana use—at least by the population at greatest risk. The drug is freely available to the young today, both in the United States and Canada, and only the more mature, stable, and older elements of the population are significantly influenced by the criminal law in this regard.

3) When the criminal law is used as a means of marijuana control, we pay a price out of proportion to the benefits. Drug education tends to be nullified, since it inevitably comes to be regarded as the handmaiden of law enforcement. Moreover, the danger to the individual's mental health and future from being arrested is much worse than from using marijuana.

4) All of the above are reasons both for decriminalization (no penalty for the user but no legal sales) and for licensed sale. The provision of licensed sale will come when we realize that prohibiting legal sales of marijuana has simply resulted in turning over to the drug culture the marketing of a product which cannot be suppressed. When we understand this we will regard the licensed, taxed, sale of the drug to adults

as a better method of “discouraging” use than is our present across-the-board prohibition—regardless of the “grounds for social concern” about the drug itself.

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Source of PCB's

The Research News report “DDT: An unrecognized source of polychlorinated biphenyls [PCB's]” by Thomas H. Maugh II (11 May, p. 578) requires critical comment, as three observations conflict with the hypothesis Maugh describes.

1) All PCB's lighter than heptachlorobiphenyl are more volatile than DDT (1).

2) The PCB's found in the environment by my group (11 May, p. 643) and others are almost always the 54 to 60 percent chlorinated mixture, that is, penta- and hexachlorobiphenyls. Di- and trichlorobiphenyls, which could be from DDT, are almost never found.

3) The ratio of PCB's to DDT in the atmosphere, water, and biota of the East Coast and the open Atlantic is always greater than 10. That would require DDT to be converted in very high yield to all penta- and hexachlorobiphenyls, which is clearly impossible by vapor-phase photolysis.

The idea is a good one, but none of the worldwide observations of PCB's in the environment support it.

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Reference

1. I. C. T. Nisbet and A. F. Sarofim, *Environ. Health Perspect.* 1, 21 (1972).

Psychosurgery

In her report on psychosurgery (16 Mar., p. 1109) Constance Holden brings up fears of certain individuals that psychosurgery is being used to “manipulate” or “repress and vegetabilize the helpless: the poor, the women, the black, the imprisoned, and the institutionalized.”

Such a movement, either local or widespread, is news to me. As a neurosurgeon who has performed most of the different types of psychosur-

gery mentioned in Holden's report, my purpose in becoming so involved has been to give selected patients greater freedom to live a normal life—freedom from pain, freedom from self-destructive impulses, or freedom from aggressive antisocial impulses. The alternative for many of these patients is to be kept in restraints almost continuously, tied to a bed or chair, restricted to a locked room essentially bare except for a mattress on the floor.

Neurosurgeons ought to favor sensible guidelines and criteria being set up by qualified medical and governmental agencies to protect patients from useless or unduly risky experimentation, whether by surgery, drugs, or electric current. Knowing that certain safeguards existed, the general public would have more confidence in the legitimacy of surgical procedures that are designed to improve overall brain function and enable a disturbed individual to have self-control over irrational impulses. Brain surgeons do not seek to control other peoples' thinking and behavior, only to help mentally handicapped individuals think and act in a way that will not cause their own destruction or that of some other innocent individual.

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Trans-Science and Responsibility

Alvin M. Weinberg's distinction between “science” and “trans-science” (Editorial, 21 July 1972, p. 211) may be yet another device by which some scientists can evade their responsibility to protect the public against the hazards of low-level radiation. What Weinberg calls “trans-science” is not necessarily beyond the limits of science; it is merely beyond the narrow concept of science that currently prevails in the physical and biological sciences. It is well inside the limits of science from the standpoint of epidemiology or public health.

Weinberg's illustration of a “trans-scientific” issue is “the biological effect on humans of very low level radiation.” He doubts that this can be “fully ascertained, simply because of the huge number of animals required to demonstrate an unequivocal effect.” This tacitly assumes that the only “scientific” way to study the problem is, for example, to expose huge numbers of inbred mice to low doses of radiation. This assumption

reflects a very narrow view of "science" and is wrong on two counts. First, it has been shown in a recent paper (1) that there are subgroups in the human population that are highly susceptible to low levels of radiation—levels which have no demonstrable effect on the vast majority of persons. It is doubtful whether it is "scientific" to study radiation effects in human populations that are not inbred by doing experiments on inbred mice. Second, it is possible to do studies of human beings which are every bit as scientific as in vivo or in vitro laboratory studies (2) and which are directly relevant to the protection of the public against environmental hazards.

The real issue is whether scientists are willing to face up to their responsibilities as scientists, or whether they will play language games to escape these responsibilities. Are we going to debate whether an issue is "trans-scientific" or not, or are we going to go out and get hard data which will settle the issue? The need is not for "trans-scientific debate," but for effective measures to protect the public against low level radiation.

An immediate need is an adequate surveillance system (1). This system

would be expensive, and entail inconvenience. For instance, a card might have to be filled out to report every diagnostic x-ray, every SST flight, every visit to installations of the Atomic Energy Commission (AEC), and so forth. Annual surveys of all persons living near nuclear power plants might be needed. Leukemia and other diseases might have to be made "reportable" throughout the United States and monitored as infectious diseases currently are throughout the United States.

This "commitment in perpetuity" to protecting the public is part of the cost of nuclear and other technology. The sooner we recognize this and get down to the scientific task of setting up protective systems, the better.

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References

1. I. D. J. Bross and N. Natarajan, *N. Engl. J. Med.* **287**, 107 (1972).
2. I. D. J. Bross, *Trans. N.Y. Acad. Sci.* **34**, 187 (1972).

I am prepared to concede that an issue which appears to be trans-scientific at one stage of scientific development may, at a later stage, be susceptible to resolution by a more sophisticated sci-

ence. I doubt whether most experts in either radiobiology or epidemiology would agree at this time that the effects of radiation doses of about 10 millirads per year (the present AEC standard for reactor emissions), or even the 170 millirads per year previously accepted, can be shown to have an unequivocal effect on humans. On the other hand, if the sample is large enough and if the studies can be successfully carried out over a long enough time, then I agree there is no reason *in principle* why the issue cannot be resolved. The disagreement then is mainly one of deciding whether the enormous effort required for such studies is an appropriate allocation of resources. The evidence Bross presents in his paper in the *New England Journal of Medicine* (1) on incidence of leukemia in children exposed to intrauterine diagnostic radiation of around 1000 millirads hardly seems relevant to the issue of chronic exposure at a rate of 10 millirads per year.

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Reference

1. I. D. J. Bross and N. Natarajan, *N. Engl. J. Med.* **287**, 107 (1972).

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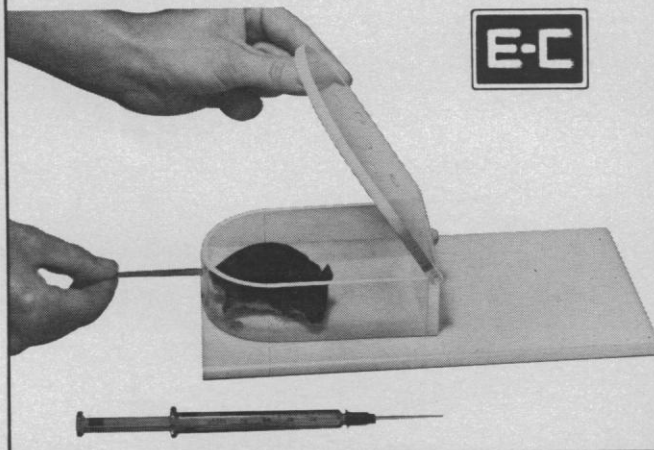


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