Letters

Protection of Human Subjects

In his editorial "Regulation of human experimentation" (21 Dec. 1973, p. 1203) Amitai Etzioni argues that the prevention of "abuses" by researchers using human subjects should be left in the hands of scientists rather than transferred to the federal government. I believe this presents a misleading dichotomy of choices and overlooks some major problems with "voluntary" control by researchers.

Etzioni argues that scientists should do the regulating because "a lay person can hardly distinguish between [the transgressors] and the overwhelming majority of ethical scientists." The sad fact, as documented by Barber *et al.*, in *Research on Human Subjects* (*1*), cited by Etzioni, is that scientists are equally unable to distinguish between their "ethical" and "unethical" colleagues. Research in violation of scientific and humanistic norms has been carried out despite professional "codes of ethics" and without professional censure since the dawn of human experimentation up to the present day.

Etzioni's second argument is that federal supervision of human research of the type encompassed in Senator Kennedy's "tough regulatory bill" may "unduly bureaucratize or hobble science." Yet his alternative is for the scientific community to establish local review committees, regional appeal boards, and a nationwide board with persons of "national stature." Such a structure is, on paper at least, no more or less bureaucratic than the one adopted by the Senate.

Rather than attack federal "intervention" in the ethics of research, the scientific community should devote its efforts to making sure that such regulation is wise and efficacious. The committees that review human research at most institutions have come about as a result of regulations laid down by the Department of Health, Education, and Welfare and the Food and Drug Administration over the past 8 years. Their less than complete success can be laid at the door of science as much as at the doors of these regulatory bodies.

What is needed, then, is cooperation between the "insiders" and the "outsiders" in the research process. This would entail, for example, a greater willingness to raise and discuss ethical issues in classroom and clinical teaching, and to recognize that time spent in the review process on "ethical" matters is as important to the success of the venture as that spent on the "scientific" aspects. Indeed it may involve the realization that the two areas are nearly inseparable—that misuse of human subjects can inject error into research results and that "bad science" (that is, poorly designed or pointless studies) is the most "unethical" kind of research. As Etzioni rightly notes, such considerations extend beyond "federally funded programs," and the process will need the participation of other disciplines and representatives of the subject pool as well. The aim ought not to be to create a top-heavy national superstructure, under either governmental or scientific egis, but to devote careful attention on the local level to the merit of research protocols and to the means by which subjects are selected and their "informed consent" is actually obtained.

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References

1. B. Barber, J. Lally, J. L. Makarushka, D. Sullivan, *Research on Human Subjects* (Russell Sage Foundation, New York, 1973).

I see a need for government control —as a last resort. (My editorial closed: "If the scientific community does not act, government regulations will and should follow.") Recent experiences remind us all that government is a very dangerous tool, and the story has only been partially told. (State and local abuses far exceed federal ones, now in the limelight.)

Second, I did not call for scientists to control themselves but for review committees "composed of scientists; persons from other academic disciplines, such as humanities, law, theology; and some representatives of the subjects themselves." Actually, Capron's position and mine are rather close. The main point is that, at the moment, voluntary controls are not being set up, and both Senator Mondale's and Senator Kennedy's bills are stalled.

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Fuel Technology Directory

I am compiling an informal directory of all university departments and institutes (and the names of the relevant faculty members) that offer or plan to offer courses on industrial fuels and related topics—a subject best described as fuel technology or fuels science and engineering. This listing is prompted by the dramatic increase in the number of inquiries we have had in the last few months from industries looking for graduates with training in fuel technology. This is a consequence of the developing energy famine and industry's greater need for specialists who are familiar with fuels and fuel utilization.

Fuel technology is primarily concerned with the utilization of fossil fuels and their manufactured and related derivatives. It includes the study of coal, oil, and gas—their sources and reserves, physical and chemical properties, and methods of analysis and structure determination. The subject is vast and is relevant to many scientific and engineering specialties, including ceramic science and metallurgy, in addition to chemical and mechanical engineering.

At present there may be only two universities in the country that even attempt to cover all of the aspects of fuel technology, but the market for graduates in this area is rapidly growing, and it is expected that universities will expand to meet the demand. The present academic base for such expansion is