Letters

Anecdotal Evidence

Letters from E. M. v. Z. Bakker, Sr., and L. Greenwald (18 Feb., p. 705) present anecdotal evidence of the liberal attitude of the South African government toward criticism of their racial policies. Here is one more bit of anecdotal evidence of another kind. Within the last 5 years, an American fellow scientist and personal friend proclaimed at a large social gathering in Johannesburg, South Africa, that that country would be better off being governed by the Blacks. That same evening, a government official came to his hotel, demanded his passport, and informed him that it was to be returned to him at the airport at his departure from the country, within 24 hours. The passport was returned, stamped "not valid for the Republic of South Africa." It took the U.S. State Department more than 2 years to get that restriction lifted. That my friend has also managed to make himself persona non grata in Pakistan, Texas, and East Germany is beside the point.

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Argonne's Role

It is too bad Ann Mozley did not interview responsible Washington officials in her otherwise thorough case study of the Argonne National Laboratory (1 Oct., p. 30). She presents the worm's-eye view of the research scientist, who wants simply to be left alone. Any direction of his work, no matter what the reason, is inherently an evil to be restricted.

This viewpoint assumes, without discussion, that Argonne's primary function today is basic research. We can all agree that basic researchers should have broad discretion in pursuing their interests. But is basic research the primary mission of Argonne in the 1970's? Or have we reached a point in the history of the atom where the nation's needs require concentration and direction of Argonne's work for the Atomic Energy Commission (AEC)?

It would appear that the scientists interviewed at Argonne are living in a dream world of the past, oblivious to the reasons why Congress appropriates the funds that support Argonne. The funds in question are not appropriated for basic research but to build the breeder. AEC has no choice but to direct the effort at Argonne. The AEC national laboratories are national assets, funded to meet national objectives. They must concentrate on the breeder, which, as the President has said, is the nation's best hope today for meeting future energy needs.

From a national perspective, Milton Shaw is following presidential and congressional orders in demanding a concentrated effort at Argonne, a laboratory which is uniquely equipped to play a crucial role in perfecting the breeder for commercial use. His stress on quality is the key to its success, innovative ideas must be translated into reliable hardware if the American consumer is to benefit.

New research missions for Argonne's able scientists may well be needed. But they make a grave mistake if they resist the directions to translate the fruits of yesterday's research into something useful for the American people.

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Mozley does an accurate and perceptive job of reporting and interpretation. I have heard nothing but endorsement of her article from my colleagues at Argonne.

Central to the problem at Argonne is the feeling that the laboratory's other work is hostage to the performance of work in the reactor program according to the directives of the AEC's division of reactor development and technology. As documented by Mozley, a major aspect of this control has been the obliteration of any autonomy in organizations responsible for major aspects of the Liquid Metal Fast Breeder Reactor Program, and this has been achieved by fiscal and contractual intimidation. That contractors and laboratory managers are, indeed, intimidated is common knowledge in the nuclear profession; any reporter at the October American Nuclear Society meeting in Miami Beach could have obtained several case histories per hour, simply by talking to people in the corridors.

It is most disheartening that the atmosphere of fear which has resulted has not received the attention of investigative reporters of either the scientific or the general press. The consequences are serious and include unhappy laboratories, a worsening American position in the competitive international reactor development scene, stifling of innovations, and loss of perspective. From 3 years of experience in Europe (at the International Atomic Energy Agency in Vienna) I can attest that both the tyranny of the controls and their debilitating effect on the U.S. reactor program are already well known abroad. A new aspect is the institutional debilitation which is now becoming apparent.

It is a measure of my own fear that I must specifically state the obvious; although I may be identified as a senior physicist at Argonne and as vice chairman of the executive committee of the Argonne National Laboratory Senate during 1971, I must disavow that this letter is in any sense authorized by Argonne or by the Senate.

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Funding Basic Research

Stetten's editorial, "The evaluation of basic science" (8 Oct., p. 105) raises an important public policy issue, only to treat it in a most unsatisfactory way. Instead of coming to grips with the problem of helping policy makers in the Congress and the executive agencies to decide how much money to put into basic scientific research, Stetten criticizes economists for not knowing the difference between "price" and "value." But even if this criticism were valid, it would not be relevant.

The problem in making decisions about funding basic research is simply that there is no way of knowing in advance whether you are funding a dramatic discovery or another dead-end experiment. It may even be true that after the research is completed and the results reported there is still considerable uncertainty about the importance of the work. Since resources are limited, it is impossible to accept the argument that, in the face of this uncertainty, we should simply fund every project proposed by every scientist who wants to do basic research; basic research is not "invaluable" in the sense that no amount of resources committed to it is too great. On the other hand, we cannot wait for the results and then supply the funds to the new Gibbs and Mendels. We, as a society, must risk some resources in the game that basic science is playing with nature. The correct amount to risk, so long as it comes largely from public funds, must, however, be a public decision; that is, one made by the Congress. It should *not* be one made by scientists. But scientists must help to inform that decision by devising criteria for choosing among basic research proposals. For example, scientists can help by providing judgments about the people involved, the experimental designs, and even the (admittedly uncertain) potential for significant discoveries in the fields in question.

Incidentally, economists have known the difference between price and value for almost 200 years (*1*). The question here is not one of price versus value, but of assigning value to activities with uncertain outcomes, where the variance of the distribution of *possible* values is enormous.

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Reference

1. See the diamond-water paradox in A. Smith, *The Wealth of Nations* (Modern Library, New York, 1937), p. 28.

Russell gives a reasonably precise description of the process whereby federal funds are allocated for the support of research. This process, depending upon congressional and executive priorities and peer judgments by scientists, is entirely familiar. It is necessarily a before-the-fact judgment, and therefore difficult.

This is, however, not the problem that I considered. After the experiment has been done, after the report has been published, how do we decide upon the value of the work? Was it or was it not worth the price that was paid? These after-the-fact judgments should, one might expect, be relatively simple; yet, even these prove to be a subject of controversy. It was to these limited considerations that I addressed myself in the editorial. The question of funding of basic research was well outside the scope of its subject matter and indeed was not mentioned. I surely had no intention of coming to grips with Russell's problem, and I note with interest that he did not come to grips with mine.

I am in complete agreement that there are some economists who appreciate the difference between "value" and "price." I carefully charged only that there were some economists who would have us believe otherwise. These, I must assume, are less familiar with their Adam Smith than is Russell.

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Marihuana and Motivation

In E. L. Abel's report "Marihuana and memory . . ." (10 Sept., p. 1038) the results do not seem to be qualitatively nor quantitatively relevant to the matter under discussion. Abel appears to neglect motivation; he assumes that the attitudes of the subjects to the experiment remained unchanged after intoxication.

It is known that a "high" changes the perceptions of marihuana subjects. Relationships and actions seem to acquire or lose significance independently of pre-"high" processes and desires. Thus, after intoxication, the "high" subjects must have related quite differently to the experiment and to the experimentalists. Such changes would affect their desire to recall word lists, and so forth.

The numerical differences that Abel obtained appear quite small when viewed in this light. They certainly do not have much bearing on a hypothesis about the effect of marihuana on "acquisition processes involved in the storage of information."

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In the report referred to by Marx, the motivational variable was assessed using the β index of signal detection theory. In addition, this variable was also dealt with in a previous publication (*1*). In both cases the data were interpreted with reference to the influence of this variable where it appeared to be relevant. As to what the subjects felt during these experiments, I leave that to Marx. The only relevant experimental findings regarding the effects of marihuana on perception are those of Caldwell and his associates (*2*), who were unable to detect any significant differences in perception between experimental and control subjects except for an auditory discrimination measure. I am thus unable to comment on Marx's statement that "it is known that a 'high' changes the perceptions of marihuana subjects," as I know of no other related experimental studies. Finally, I contend that a 13 percent difference in the ability of experimental and control subjects to learn a list of 120 common words is not quite as meaningless as is suggested by Marx.

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References

1. E. W. Abel, *Nature* **231**, 58 (1971).
2. D. I. Caldwell, S. A. Myers, E. F. Domino, P. E. Merriam, *Percept. Motor Skills* **29**, 745 (1969).

Freedom of Information

Nicholas Wade (News and Comment, 4 Feb., p. 498) refers to the forced release of the Garwin report on the supersonic transport as a prime example of the effective working of the Freedom of Information Act and hails the strong action taken by Appeals Court Judge David L. Bazelon. Would it not be appropriate also to give the name of the attorney whose year-long efforts and able presentation to the lower court, and then to the appeals court, paved the way for the landmark decision? I refer to Peter Koff, an active member of the Sierra Club and other conservation groups, and the assistant director of the Citizens League Against the Sonic Boom.

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