# LETTERS

## Under observation

SMITHSONIAN INST., MOTOROLA FOUNDATION

Three writers respond to an editorial about the well-being of "strategic research" in the United States. Neuroscientists studying drug abuse are said to have "made major contributions to our understanding of brain and behavior." Evidence that methyl chloride can cause cancer in mice, but not necessarily in humans, is further discussed. A diagnosis made by Alois Alzheimer is revisited. Meteorite recovery in the Antarctic and "thriller" comet collisions are considered (at right, a comet bears down on the young Earth). And does the phrase "flatworm gender" make any sense?

### Strategic Research

As stated in Floyd E. Bloom's 2 August editorial, "The Road to Stiff Competition" (p. 869), the substantial increase in R&D (research and development) investment by the Japanese government "in particular" is a warning signal.

Consider, therefore, a cost-effective way to fund "strategic research" and to bridge the gap of seemingly "irreconcilable cultural differences" between research in industry and in academia—a sabbatical program funded half by industry and half by government. Researchers would be encouraged to spend 1 to 2 years working with counterparts in other settings on applied R&D projects. If the researcher were in academia, the "other" setting or "counterpart" would be in industry, and vice versa. Thus, considerable cross-fertilization and collaboration could be enabled by joint industry-government grants.

Such a program, moreover, would not require government to take on the impossible task of "picking winners," only that of helping to select good applied R&D project proposals in concert with industry.

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There may not be as many opponents of "strategic research" as Bloom fears. Many academic scientists have had direct and positive experience with funding agencies that emphasize strategic research, because they have received support from one of several dozen state-level programs in technology-based economic development.

Yes, some of these programs support frank product commercialization, but many also include as part of their portfolio long-term research targeted at the needs of industrial sectors strategic to the state. In many cases, academic scientists have found new sources of funding and collegial support in private companies that are eager for a window on the long-term research no longer done in their own labs.

Policy-makers in Washington, D.C., on both sides of this issue have tended to ignore the cultural impact that these state-level programs have had on academic acceptance of the legitimacy of the industrial research agenda. Much information is available from the State Science and Technology Institute at Battelle or from the Science and Technology Council of the States at the National Governors Association.

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Scientific research is not just competitive, it is also cooperative. The report from the Council on Competitiveness (*1*) cited by Bloom might be ignored by many scientists because that council appears to them to be controlled by industrial and political interests. Some scientists will be aware of the Policy Forum by Philip H. Abelson (26 July, p. 445) that describes how corporate research labs in the United States have been downsized and R&D functions transferred to business units. Long-term research to lead to innovative products for the future has diminished. Perhaps this encourages industry spokesmen to call on universities to do "strategic" research—in other words, the research that industry previously supported.

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**References**

1. *Endless Frontier, Limited Resources: U.S. R&D Policy for Competitiveness* (Council on Competitiveness, Washington, DC, 1996).

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## Psychobiology and Biopsychology

In reference to Eliot Marshall's News & Comment article of 9 August (p. 731), it is difficult to understand why drug-abuse neuroscientists are concerned about being fully integrated into the National Institutes of Health (NIH) peer review system. Those scientists have conducted cutting-edge research on and have made major contributions to our understanding of brain and behavior: They predicted (from behavioral studies) the existence of and then identified several classes of opiate receptors, thereby revolutionizing the concept of neurotransmitters and brain function; they specified and cloned the receptors for every major drug of abuse (and discovered several completely novel ligands); they advanced the conceptualization of drug dependence as a biologically mediated disease; and they made fundamental discoveries involving the mechanisms of analgesia, tolerance and dependence, pleasure and pain, and reward and punishment, and then used all of this information to develop new treatments for drug abuse, alcoholism, nicotine addiction, and pain. In light of these and other impressive accomplishments, they should be able to compete successfully against and take their place among the best in the world in the life sciences.

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Marshall's article suggests that the distinction between psychobiology and biopsychology is fuzzy and hard to explain, even by NIH staffers. This portrayal of arbitrariness in naming these two neuroscience specialties is not justified. Psychobiology emphasizes biologically dependent variables (for example, brain states) as functions of psychological or behavioral independent variables. Biopsychology emphasizes psychologically or behaviorally dependent variables as functions of biological independent variables (for example, drug states). The two approaches to brain and behavior are complementary in that it is impossible to establish a causal link or isomorphism between a behavioral state and a brain state without both approaches. It is high time that the two were combined in NIH study sections.

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## Science Teaching: How to Spend $5 Million

I second the opinion of Stan Metzenberg (Letters, 9 Aug., p. 721), regarding the absurdity of the National Science Foundation spending $5 million to encourage faculty at research universities to teach well. Metzenberg's critique, however, which aims at increased support for the "second-tier universities" where "faculty actually teach their own courses," leaves out the fact that it is this nation's liberal arts and sciences colleges which have historically produced a dispro-