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LETTERS

Psychological Matters

Psychologists search *Science* regularly hoping to find articles about the scientific study of behavior. It was thus a pleasure to find the Editor himself dialoging so knowledgeably with Dr. Noitall about psychological matters ("The attractiveness of gloom," Editorial, 17 Jan., p. 265).

Even in frivolity, however, it is important to get the facts straight. Dr. Noitall says that "evolution has provided *Homo sapiens* with an unconditioned reflex that automatically blames the people one has despised all along." There is no such unconditioned reflex. The described reaction, while assuredly psychological, is a learned phenomenon, much more complex than even a conditioned reflex, and is amenable to empirical investigation. Scientific study is needed on the behavioral development and occurrence of hostility and aggression. One hopes that *Science* will be an ever more hospitable place for publication of such research.

Another serious point, inspired by the genuine humor of the editorial: Dr. Noitall responds to the happy observation that life expectancy continues to increase, as a benefit of disease control, with the prediction that among gloom and doom people "panic will spread through the population when they read about the epidemic of deaths through natural causes." The fact is that as death by disease diminishes, through public health, biomedical, and technological advances, death and debility particularly among the young increase proportionately from accidents, suicide, homicide, excessive drinking, drug-taking, and dangerous sexual practices. Behavioral misadventures now exceed all diseases combined as the cause of death in young people, at least to age 35. Behavioral science—psychological studies—can show us how they happen, to whom they happen, what the developmental and behavioral mechanisms are whereby these life events take place, and what interventions may successfully impede their occurrence.

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I am stunned to hear that blaming the people one has despised all along is a learned response rather than an unconditioned reflex. It is the first mistake I have made since second grade. I apologize to Dr. Lipsitt and to all psychologists and will lobby to get more behavioral science into *Science*.—**Apologetically, Noitall**

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Education Resources

Philip H. Abelson's editorial about the role of the National Science Foundation's Energy Research Centers (ERCs) program in improving our nation's competitiveness (7 Feb., p. 661) should increase the awareness of the benefits of cooperative industry, government, and university programs. The success of the ERCs should help to bring down the institutional and cultural barriers that separate these sectors, an essential step toward improved competitiveness.

However, focusing on universities alone as the educational instrument to improve competitiveness is not sufficient. The National Science Foundation and the Department of Education funded a study that reported that U.S. schoolchildren ranked among the lowest in the world in science and math skills (*1*). If we expect to be competitive in the future, a program similar to the ERCs that focuses on improving elementary and high school science and math education is also needed.

The House Committee on Education and Labor and the House Committee on Science, Space, and Technology are addressing this issue legislatively. Do the science, technology, and education communities recognize the importance of a commitment of scarce resources to this area?

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REFERENCES

1. *Learning Science: The Second International Assessment of Educational Progress* (Educational Testing Service, Princeton, NJ, 1992); *Learning Mathematics: The Second International Assessment of Educational Progress* (Educational Testing Service, Princeton, NJ, 1992).

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Tuberculosis Rebounding

Obviously, with stentorian comments such as "There are no good molecular biologists left in the area" and "all the good biochemistry on

the mycobacterium stopped 20 years ago" (News & Comment, 28 Feb., p. 1064), I owe an apology to many, particularly to those who have developed the means for the present-day sequencing of the genome of *Mycobacterium tuberculosis*; the cloning, sequencing, and provision of many of its key antigens; the development of recombinant live Bacille Calmette-Guérin (BCG) and other vaccines expressing M. *tuberculosis* antigens; the cloning of DNA responsible for the synthesis of complex secondary gene products; the characterization of repeated insertion sequences and their application to the diagnosis and epidemiology of tuberculosis; and so on. And, of course, there has been considerable activity in the chemical definition of the cell wall of M. *tuberculosis* and the chemistry and physiological function of many of its proteins.

The point I made was that research on the molecular mode of action of the frontline tuberculosis drugs stopped in the mid-1970s, and work on the genetic basis of resistance to these drugs was never initiated at that time. For instance, Winder and Collins (*1*) showed in 1970 that isoniazid had an instantaneous and profound effect on mycolic acid synthesis, and Takayama *et al.* (*2*) in 1975 were to show that fatty acyl chain elongation and insertion of a Δ-5 double bond were probably primarily affected by isoniazid. However, subsequent work on the mechanism of isoniazid action and mycolic acid synthesis virtually stopped at that time. I also made the point that elucidation of the biosynthetic pathways leading to the complex D-arabino–D-galactan–peptidoglycan of M. *tuberculosis*, a molecule that governs many of the pathogenic features of the tubercle bacillus and is the site of action of several drugs, had not been pursued, unlike analogous structures in gram-positive and gram-negative bacteria, and that now there was a dearth of biochemists and molecular geneticists in these specialized areas, areas crucial to our understanding of drug action on M. *tuberculosis* and the development of new drugs.

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REFERENCES

1. F. G. Winder and P. B. Collins, *J. Gen. Microbiol.* **63**, 41 (1970).
2. K. Takayama, H. K. Schnoes, E. L. Armstrong, R. W. Boyle, *J. Lipid Res.* **16**, 308 (1975).

Provocative Crystallography

I am quoted in a boldface italic display as saying (Research News, 13 Mar., p. 1355) that "I wrote [my 24 February *Physical Review Letters*] article to be downright provocative and almost insulting." I was explaining to your reporter that I had adopted a polemical tone in the hope of enticing a response out of the users of the crystallographic scheme I was trying to improve upon. In the context of our conversation it was clear that my intent was to provoke, not insult. My respect for the designers of the superspace scheme is considerable, and I am pained by the prominent display of a fragment of an informal conversation so that it appears otherwise.

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Neem Seed Oil Toxic to Crustaceans

Before getting too enthusiastic about the potential of neem seed oil, which appears to be a promising biological control agent (Research News, 28 Feb., p. 1070), one should note that the mechanisms of action of this agent (blocking ecdysone and inhibiting chitin formation) are ones that are likely to cause problems in most arthropods, including crustaceans. Other control agents with similar modes of action, such as Dimilin, have been found to be extremely toxic to crustaceans and therefore risky for use in areas where they could enter aquatic systems and damage organisms that are important in food webs.

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Corrections and Clarifications

The author notes for the report "Multiple intestinal neoplasia caused by a mutation in the murine homolog of the APC gene" by L.-K. Su *et al.* (1 May, p. 668) should have indicated that there were two authors to whom correspondence should be addressed: Amy Rapaich Moser, McArdle Laboratory for Cancer Research, University of Wisconsin, Madison, WI 53706; and Kenneth W. Kinzler, Molecular Genetics Laboratory, Johns Hopkins University School of Medicine, Baltimore, MD 21231.

An item in ScienceScope (14 Feb., p. 787) should have stated that a supercapacitor could extend battery life in an electric vehicle from 400 to 800 cycles, thereby effectively doubling vehicle range.