LETTERS

Information Storage

In his otherwise thoughtful and sensitive editorial "The computer issue" (26 Apr., p. 401), Daniel E. Koshland, Jr., inadvertently highlights a number of serious crises. Organic chemists, it would appear, have been trying for years to store information in their cerebellums. Small wonder that they should welcome the computer age. Has this spread to other disciplines? Is it too late for help? Or does this merely reflect the absence of a deputy editor for Biological Sciences? Or has proofreading at *Science* been delegated to a computer?

CARL A. BEAM
Department of Biology, Brooklyn College of the City University of New York, Brooklyn, New York 11210

I have been caught in my attempt to upgrade underprivileged parts of the brain. Since no one really knows where memory is localized, it seemed unfair to assign a lyrical sounding organ like the cerebellum to mere motor control, while assigning higher learning status to such noneuphonious regions as the right parietal lobe or the prefrontal cortex. This new editor bows to the alertness of *Science* readers and is voluntarily suspending his poetic license for at least three issues of the magazine.

—DANIEL E. KOSHLAND, JR.

"Star Wars" Program

"Only partly in jest" is the way R. Jeffrey Smith describes the statement by Edward Wegman of the Office of Naval Research about the Strategic Defense Initiative (SDI) or "Star Wars" program that "we don't want to have a few lines of bad code mistakenly set off a nuclear weapon" (News and Comment, 19 Apr., p. 304). This quotation follows a statement that "100 million lines of error-free software code must be written" for the SDI system. But whether 100 million is the correct estimate of the size of the program needed or not [an estimate of 10 million has appeared elsewhere (*1*, p. 87)], this is no joke. In no foreseeable future—and this certainly covers the 10- to 20-year period during which the SDI is to become operational—is there any valid prospect of writing 10 million or 100 million or anything approaching this number of correct lines of code. There is even less prospect of writing a program such as this that will work the first time it is used, as it must. No regimen of testing or simulation and no application of program verification techniques is even on the horizon that would not leave such a vast program with many bugs. Thus, quite aside from any other technical, political, or economic objections that might be raised about the Star Wars system, its computer software problems doom it to failure.

It is extremely distressing to see that prestigious engineering schools are rationalizing their participation in the Star Wars program. No one doubts that interesting research problems are posed by the attempt to develop this sytem. And let us accept that traditional standards of open publication of university research will be observed. Nevertheless, when enough money is at stake, universities are all too ready to accept Pentagon largesse. But the project itself is intellectually dishonest. Is intellectual honesty one academic value that will succumb to the economic difficulties in which universities find themselves?

ANTHONY RALSTON
Departments of Computer Science and Mathematics, State University of New York, Buffalo 14260

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Clay Eating

Further to A. M. Behbehani's letter (12 Apr., p. 130) about geophagy in early Islamic medicine, it is worth recalling that small geophagical medallions, called *terra sigillata* from the Latin *sigillum* (seal), were prescribed by physicians throughout the Mediterranean world of classical antiquity. The best known clay mining site was on the Aegean island of Lemnos. The advent of Christianity provided continuing religious endorsement, and *sigillata* were included in Western pharmacopoeias as late as 1848 (*1*). To this day holy clay tablets, officially blessed by the Roman Catholic Church, are consumed throughout Central America. Most notable are those from the shrine of Esquipulas in Guatemala (*2, 3*).

In developing countries, clay eating is a common practice during pregnancy. In circumstances of nutritional need, it is probably a beneficial custom. Evidence derived from simulated human digestion of clays, including termite and vespid clays, consumed during pregnancy in Ghana, Sierra Leone, and Belize suggests that geophagy can provide important increments of minerals and trace elements essential for fetal development (*3*).

JOHN M. HUNTER
Departments of Geography and Community Health Science, Michigan State University, East Lansing 48824

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Fisheries Research

Appropriately, much has been made in the pages of *Science* of the impoundment of National Institutes of Health (NIH) funds by the Office of Management and Budget (OMB), yet we have heard little about a similar impoundment of Wallop-Breaux funds. That fund, known as the Sport Fishing and Boating Enhancement Fund, was passed as an expansion of the Dingell-Johnson program, which has been in place for many years. The expanded fund provides monies to enhance fishing and boating in the United States, partially through expanded fisheries research. As is the case with NIH, ongoing and new programs have been negatively affected, student training imperiled, and planning disrupted by the impoundment. What is difficult to understand is why OMB would tie up money that is generated from user fees. All of the Wallop-Breaux fund results from excise taxes placed on fishing and boating equipment and marine fuels, so only the users are expected to pay for the benefits which they reap. Release of these funds is critical for continued development of research on sport fisheries in the United States. We in fisheries research continue to hope that this issue will receive the attention which it deserves in Congress and in the public sector.

ROBERT R. STICKNEY
Fisheries Research Laboratory and Department of Zoology, Southern Illinois University, Carbondale 62901

Erratum: In the report "Transfection of v-*ras*^{H} DNA into MCF-7 human breast cancer cells bypasses dependence on estrogen for tumorigenicity" by A. Kasid *et al.* (10 May, p. 725), a line connecting two sentences was inadvertently omitted from the text. On p. 726, column 1, line 9, the sentence beginning "Densitometric scans of the blots" should have continued as follows: "showed that the transfectants expressed *ras*^{H} RNA at levels 10 to 12 times higher than wild-type MCF-7 cells (Fig. 1E) or MCF-7$_{gpt}$ cells. Wild-type MCF-7 cells contained a low level of endogenous c-*ras*^{H} RNA and neither its expression nor that of the exogenously acquired v-*ras*^{H} gene was altered by E_2 treatment (Fig. 1E)."