Letters

Homo photosyntheticus: Reaction

We were dismayed by Daniel E. Koshland, Jr.'s, satirical editorial (29 Jan., p. 449) about the high school student who is morally opposed to dissecting frogs. Koshland ridicules the student's suggestion—made on a television commercial for a computer company—that she could learn frog anatomy from a computer program.

The Humane Society of the United States is proud to be supporting the cause of the student who has so irked Koshland. The aim of her legal battle is not the abolition of dissection or the undermining of science, but the affirmation of her right to learn anatomy without participating in a system that exploits animals. She proposes to substitute an array of alternative exercises, including computer simulation, that are of greater rigor than dissection. Given this simple aim, we as scientists and animal welfare proponents were surprised that such a reactionary editorial would appear in *Science*.

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Response: Scientific societies are against cruelty to animals, but occasionally are less diligent in advocating rules to ensure this goal; humane societies are against cruelty to animals, but can err on the side of making regulations more stringent than any first-rate hospital would enforce. I objected to the simplistic logic and the sanctimoniousness of the commercial. Humane societies keep abandoned pets in cages and have to kill them (in numbers far exceeding those sacrificed in research) if they cannot find homes for them. Yet scientists do not break into humane societies or accuse them of being secret sadists covering up their evil deeds by a veneer of do-goodism. Animal research has developed cures for animals that have relieved far more pain than is ever endured in research. If humane societies would make clear that they wish to do the most good for the least pain, we could all agree on a common goal.

—DANIEL E. KOSHLAND, JR.

I have read and reread Koshland's editorial "*Homo photosyntheticus*" with much amusement. This exercise in absurdity has been sorely needed, although a storm of protest is sure to follow. Thank you for this delightful bit of humor.

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Foreign Graduate Students

Concerning "Foreign engineers on rise" by John Walsh (News & Comment, 29 Jan., p. 455), we Americans should get off our ethnocentric horse and welcome those highly able foreign graduate students in engineering, science, and mathematics. I suggest the following.

1) Systematically recruit the best who can be found in all the world.

2) Require a high score on the Test of English as a Foreign Language (TOEFL), say, 600.

3) Have those who are accepted arrive, unaccompanied, early in the summer preceding their first graduate year here. At an appropriate center, give them 6 to 10 weeks of total immersion in the English language, stressing aural, oral, and pedagogic aspects. Preferably, also provide each a roommate whose native language is U.S. English.

4) Urge the highest achievers to earn the Ph.D. degree.

5) Encourage any of the best who wish to remain in the United States and become citizens to do so. (Handle brain-drain issues as adroitly as feasible.)

To a great extent, our country became outstanding because of the continual arrival of eager, energetic immigrants. Initially, they have usually done much of our menial work—jobs that most Americans shunned as being too laborious, dangerous, or poorly paid. I suspect that many bright American college graduates now consider doctoral study and the ensuing employment as risky, too intellectually demanding, and not cost-effective even in the long run. So be it. Let's be grateful for the brilliant, highly motivated foreigners who consider it a great privilege to live as graduate students for many years on a pittance and then take jobs most yuppies don't want. We didn't even have to pay for their kindergarten through 16 years of pregraduate education!

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Walsh quotes Stanford S. Penner as saying that incorporation of foreign nationals into the U.S. educational system is a "terrific economic bargain for this country." This attitude is a shortsighted assessment comparable with that attributed in recent times to the corporate sector because of its concentration on short-term profits. Our country's failure to produce, from among its citizenry, the skilled manpower that underpins our nation's technology confirms the presence of an unhealthy educational system. We should turn our attention to the availability of an untapped manpower resource extant among ethnic U.S. minorities.

Attempts to draw minorities into the scene have not been as effective as they could be because those interventions can be described as being *for* minorities rather than *with* minorities. I recently served on a fellowship selection committee for Hispanic-Americans to recommend 20 awards for degree candidates in science and engineering from among 140 applicants, all of whom presented competitive credentials and below-average risks. A number of these applicants sought careers in engineering, but the likelihood is high that most of their aspirations will not be met because of lack of funds and appropriate counseling and mentoring.

In sum, unless more appropriate wisdom is incorporated into the highest levels of the policy, budget, and decision-making process for science and engineering education and training, the situation will continue to deteriorate and today's potential manpower assets will become tomorrow's social welfare liabilities.

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Schistosomiasis Eradication in China

Progress on a vaccine for schistosomiasis described in the special issue on immunology (20 Nov., p. 1065) is indeed good news. But the 200 million individuals who suffer from this disease might feel more bitter than joyful if they knew the story (*1*) of how the disease was brought under control in China.

The Chinese government decided in 1955 that the disease must be attacked by interrupting the life cycle of the fluke which caused the illness. This parasite is released from humans in the feces. If feces contaminate surface water, the parasite is picked up by snails living in the water. The snails then release it into the water in a form that can burrow through human skin and infect a person. The Chinese considered ceasing to use human feces as fertilizer in the rural areas where the disease was widespread; or