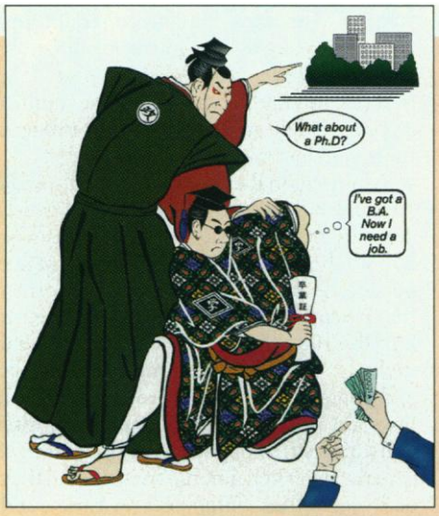
LETTERS



KAZUKO ASHIZAWA

Dynamics

The "multiregional" and "out-of-Africa" models of the origin of modern *Homo sapiens* are compared in light of recent studies of variation in key genetic loci. A woodblock created by a mysterious Japanese *ukiyo-e* artist, Toshusai Sharaku, in 1795 is said to be the inspiration for a cartoon created for a special section of *Science* (at left). And several writers revisit topics raised in previous Letters sections: possible consequences of insect resistance to transgenic *Bt* cotton plants; the reputation of the field of sociobiology; and possible sources of tritium, which is needed for the U.S. nuclear arsenal.

Resistance Management

Last summer's widespread failure of the transgenic *Bt* cotton to control the cotton bollworm (J. Kaiser, News & Comment, 26 July, p. 423) strongly suggests that the cotton is not producing high levels of *Bacillus thuringiensis* (*Bt*) toxin. If so, this means that the cotton does not satisfy the requirements of the experimental high-dose-plus-refugia strategy that the Monsanto Company has said it was relying on to avoid the development of the resistance to *Bt* in pests. Monsanto now says (W. R. Deaton, Letters, 20 Sept., p. 1641) that for the cotton bollworm (one of three pests the cotton is advertised as controlling) the high-dose element of the strategy is unnecessary; refugia (non-*Bt*–containing plants) alone will do the trick. Under the new theory, Monsanto appears to be relying heavily on the multiple wild plant and crop hosts as potential refugia.

In essence, this is a new resistance avoidance strategy—mid-dose-plus-whatever-refugia-happen-to-be-around. Because it was only recently proposed, it appears not to have been described by Monsanto in submissions to the Environmental Protection Agency (EPA) requesting approvals for its crops, nor evaluated by EPA. Will it work? Perhaps, but there is no such assurance. Not all non-*Bt* plants constitute "refugia" for purposes of resistance avoidance strategies. They must, among other factors, be within a certain distance from and harbor pests at the same time as *Bt* crops.

The bottom line is that both the government and the biotechnology industry appear to be working out resistance management plans as they go. Meanwhile, insects are being exposed to millions of acres of *Bt* crops. If the insects develop resistance before management plans are in place, we will have irrevocably and unnecessarily lost the use of one of our safest natural pesticides.

Margaret Mellon
Director,
Agriculture and Biotechnology Program,
Union of Concerned Scientists,
1616 P Street, NW, Suite 310,
Washington, DC 20036, USA

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The Image of Sociobiology

One must agree with S. B. Hrdy *et al.* (Letters, 11 Oct., p. 162) that a substantial amount of good work is being done in sociobiology. However, with all due respect for good intentions, their attempt to blame the questionable reputation of the field on "detractors" and the public appears misplaced. To be sure, in some quarters there is a knee-jerk rejection to anything that smacks of a "biological explanation" of human behavior; but this is not the main problem. Rather, it is a tendency for promoters of sociobiology, some of whom have been central to its development, to advance extreme and untenable claims (*1*). The reaction of many "detrac-