an increase in the birth rate by offering, among other things, financial inducements to mothers. But the Japanese people, over 100 million on a small chain of islands, showed good sense in deciding to stay with their modest population growth rate. That left the government with two choices to solve the coming labor shortage. One was to invite *Gastarbeiten*, as western Europe did, but Japan refused to alter its immigration policies. The only other choice available was to automate, and that the Japanese did with a speed unmatched in other industrial countries.

Japan today has more industrial robots than the rest of the world put together, and *that*, not their managerial expertise or inscrutability, is the key reason for their industrial dominance. Japan had a 10-year head start on the industrialized West with regard to automation. Furthermore, they automated industry with the full support of the workers, who saw automation not as a threat, but as a powerful tool of productivity.

In our country, with its great labor surplus (what else do you call millions without jobs?), any further attempts at automation will be strongly resisted by workers who see it as a threat, and our attempt to overtake or pull abreast of Japanese industrial and economic growth will never get off the ground. Unless, of course, another 500,000 highly skilled workers are prepared to be laid off.

JAMES S. MELLETT
Department of Biology, New York University, New York, NY 10003

Effect of Growth Hormone on Cows

An overlooked concern about the potential impact of genetically engineered bovine growth hormone on the dairy industry (News & Comment, 11 July, p. 150) is the effect of daily administrations of this hormone to hyperstimulate cows to produce 20 to 40 percent more milk.

Under present intensive husbandry conditions, the average dairy cow is spent by the time it is 4 to 5 years of age because of so-called production-related diseases. It is highly probable on the large dairy farm that hormone-stimulated cattle will burn out at an even faster rate, hence the concern that this treatment will increase their suffering as well as the incidence and severity of production-related diseases (*1*).

As for the purported economic savings, these cows will eat more food in order to produce more milk: you don't get something for nothing. Second, with a higher turnover rate of dairy cows, the rate of replacement with young cows would increase as would the cost, since it takes time and money to raise a young calf to maturity. This is one of the hidden costs of this new biotechnology that has so far been overlooked.

MICHAEL W. FOX
Humane Society of the United States, 2100 L Street, NW, Washington, DC 20037

REFERENCE

1. M. W. Fox, *Farm Animals: Husbandry, Behavior, and Veterinary Practice* (University Park Press, Baltimore, MD, 1984).