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clinical tradition of trying to detect, observe, and ameliorate a potential health problem," Davis argues. Critics of the program, he contends, waged a "crusade against evil" which distorted the issues and impaired free intellectual exchange chiefly because of a conviction that any attention to genetic factors in behavior will have unhappy social consequences.

Beckwith and Miller argue that previous studies showing XYY males to be anti-social were tainted with error and bias; they cite other research revealing no significant correlation between the genetic abnormality and aggressive behavior. Because of sensational publicity accorded "criminality genes," the Harvard study "may have created serious problems in the lives of the observed children that would not have occurred otherwise." In addition, Beckwith and Miller say, any conclusions reached by the study might be invalid because there was no "control group" of "normal" children, studied alongside the XYY children, to rule out any possibility of bias.

Experiments of this sort, they argue, reinforce the notion that genetics, rather than "social and economic deprivation," are to blame for social problems. Noting hasty proposals by criminal-justice specialists for the identification and preventive detention of XYY males, Beckwith and Miller urge greater public participation in decisions to conduct scientific research.

Triumph Over Pestilence

"The Eradication of Smallpox" by Donald A. Henderson, in *Scientific American* (Oct. 1976), 415 Madison Ave., New York, N.Y. 10017.

For the first time in medical history, doctors, epidemiologists, and roving health workers may have eradicated a deadly, pestilential disease—smallpox. The last known case was reported on Aug. 9, 1976, in Ethiopia. If no new cases are reported during 1977 and 1978, and if a World Health Organization commission is satisfied with the reporting, smallpox will be declared to have been eradicated from the earth.

Henderson, chief medical officer in charge of smallpox eradication at the WHO in Geneva, explains that when the campaign began in 1967, smallpox was considered endemic in 33 countries, with 11 others reporting imported cases. As successive centers of infection were eliminated, epidemiologists evolved increasingly effective methods of reporting, quarantine, and mass vaccination. WHO's efforts have now narrowed to two remote areas of Ethiopia.

To achieve success, health workers visited rural schools and market places to collect rumors of unreported smallpox cases, and as incidence declined they offered progressively greater rewards for fresh information. Special rosters listed every person living within a one-mile radius of an infected village. Guards were hired to cordon off the homes of smallpox patients and to ensure that all visitors were inoculated; meticulous records were maintained.

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Dr. Edward Jenner's (1749-1823) pioneering work with smallpox vaccines, Henderson explains, led eventually to two post-World War II developments—the reusable, bifurcated needle (requiring one-fourth as much vaccine as the older “scratch” technique) and a soluble, freeze-dried vaccine that made possible the successful WHO campaign. Field workers carried the two in shirt-pocket kits.

The total 10-year eradication effort cost less than \$250 million. According to Henderson, vaccine production and quarantine measures no longer necessary will save between \$1 and \$2 billion a year. Eradication of smallpox will represent a major milestone in the history of medicine. The logical next step? Applying the lessons learned to programs for controlling diphtheria, whooping cough, tetanus, measles, poliomyelitis, and tuberculosis.

The Saga of the Harvestable Tomato

“Tomato Technology” by William H. Friedland and Amy Barton, in *Society* (Sept.-Oct. 1976), Box A, Rutgers University, New Brunswick, N.J. 08903.

Huge demands for capital investment; an abrupt two-thirds drop in labor requirements and a shift from imported Mexican field hands to American housewives; survival of only the largest growers; vertical integration of the processed-tomato industry—these and other largely unanticipated changes came quickly after Californians developed a mechanical harvester and bred a new tomato solely for the machine.

In this “tomato case study,” Friedland, a sociologist at the University of California, Santa Cruz, and Barton, of the Community Development Research Laboratory at the same university, analyze the sharp discrepancies between the original worries that produced sudden change in the tomato industry and the social effects that followed.

Convinced that acute shortages of labor would result from federal outlawing of the “bracero” program, under which Mexican field workers were imported to California each year at harvest time, the University of California set to work seriously in 1947 on an ill-defined machine to pick an as-yet-undeveloped tomato.

By 1961, a firmer, more easily detachable fruit had been bred and a \$25,000 mechanized harvester was on the market. Similar machines now sell for more than \$70,000 and require vast acreage to realize their potential. Despite costs of equipment and land, the percentage of machine-harvested tomatoes climbed from one per cent to 99.9 per cent between 1962 and 1970, while the number of growers declined from 4,000 to 597, and the work force fell from 50,000 to 18,000.

The surviving farmers transformed their California Tomato Growers Association into an effective weapon against processors who had previously exploited them. But despite the sophisticated new production system, labor relations remain backward. Unionization is coming. The challenge to organized labor is whether it can unionize a work force made up largely of women employed only at harvest time.