dicate that the direct and immediate benefits will go to a relative few in a limited number of locales while neither serving the national interest nor benefiting the general public." In the case of mechanization, Bergland said, "we will not put federal money into research where—other factors being equal or neutral—the major effect of that research will be the replacing of an adequate and willing work force with machines." It is a much-qualified policy, leaving plenty of room for interpretation.

Bergland said that up to this time, too much emphasis has been placed on the value of productivity gains promised by new farm technology. He would like to look more carefully at the social costs imposed by technologies before they are funded. He passed the hard task of distinguishing the socially beneficial from the harmful categories of research to a committee. It is a cat-and-dog group, made up of roughly equal numbers of consumer and farm representatives.

Part of the reason for focusing so critically on mechanization, Bergland explained, is that he thinks private industry should pay for this highly applied and often profitable research from its own funds. Bergland also has doubts about the future viability of highly mechanized farms, because "we no longer have cheap and abundant supplies of energy. And we have learned that mechanical and chemical technology can exact a high price in terms of erosion, pollution, and human health." The bulk of federal research funds, he thinks, should be invested in basic science in the hope that fundamental discoveries may reveal ways to reduce the use of fertilizer, pesticides, and petroleum.

One of the co-chairpersons of the mechanization review committee, Susan Sechler, USDA's deputy director of the Office of Economics, Policy Analysis, and Budget, concedes that work is progressing slowly, and that "we have to move slowly" because the subject is so controversial. Great care is being taken to avoid doing anything that might seem to restrict scientific freedom or focus negatively on particular universities or researchers. She is convinced, however, that agriculture has become "a tremendously overmechanized industry," and that research administrators must be more critical of projects that could accelerate the trend toward mechanization.

Asked to describe the kinds of research that might fall into disfavor, Sechler gave few specifics. The department is still grappling with the principles of its new policy. "Some people thought we had a plan in the bottom drawer," Sechler said. But that is not the case; the plan is still inchoate.

The tomato harvester, which has eliminated thousands of stoop-labor jobs in California. [USDA photo]

A preliminary survey turned up 20 to 30 USDA-funded projects (costing about $1 million) that might be classified as mechanization research, but Sechler thinks the true number of mechanization projects may exceed 600. The task of sorting these will begin later, after the advisory group has developed criteria for judging social impacts.

USDA officials are loathe to specify projects that might need critical review.

Another Smallpox Scare

"It was a madhouse here for a time," says smallpox expert Steve Jones of the Center for Disease Control (CDC) in Atlanta, Georgia. The hubbub was caused by the announcement on 23 April that a case of smallpox had been confirmed in Italy.

The world's last known case of smallpox occurred in Somalia in October 1977. The Italian case would not only have broken a 3-year record, but, far more seriously, might have undermined a fundamental principle of the World Health Organization's (WHO) eradication program, that there is no natural reservoir in which the disease can lie hidden.

Smallpox authorities are used to rumors that the disease has recrudesced, but the news from Italy was more than mere rumor. The regional health authority for Lombardy announced officially that a 32-year-old engineer, Umberto Moretti, had developed smallpox symptoms after returning from a trip to Indonesia. The diagnosis was based on one of the more definitive tests for smallpox, an electron microscopist's study of the virus samples.

At CDC, the news caused tremendous consternation. Calls flooded in from all over the country from public health workers, physicians, and people planning visits to Italy. The smallpox specialists at CDC clung to the hope that the report would turn out to be false.

Further news from Italy disclosed that the Italian engineer had originally been diagnosed by his clinician as having chicken pox. It was only when samples went to the laboratory that the diagnosis of smallpox virus had been made. A WHO doctor was dispatched from Geneva to examine the patient, and diagnostic samples were sent to a smallpox expert in Paris. Within two days the smallpox threat had been dissipated: the virus was herpes, and the patient had simple chicken pox.

WHO has found numerous occasions on which to announce the eradication of smallpox. Another such announcement, issued with some new degree of bureaucratic solemnity, is due to emerge on 12 May. Experts consider that only definitive action by the Nobel Peace Prize committee can break the chain of transmission.—NICHOLAS WADE

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