was humbug from the start. A new analysis of the NCI data has shown not only that New Jersey had no cancer epidemic in 1974 but that the differences among the cancer rates in New Jersey and other areas of the nation were *decreasing*.

Granted, New Jersey did suffer from abnormally high cancer rates during the 1950s. Between 1950 and 1954, for example, New Jersey men aged 35 to 54 died of cancer at a rate 20 percent above the national average. But by the early 1970s, the two rates differed by no more than a single percentage point.

This "convergence" of the rates, Greenberg maintains, had little to do with air and water pollution. Medical wisdom now links outdoor pollution to only one percent of all U.S. cancers; tobacco smoking, eating fatty foods and other nutritional factors, and exposure to carcinogens in the workplace are responsible for 60 to 90 percent of all cancer deaths in America. By the time NCI had released its report, a variety of factors, including affluence, was already eroding *regional* variations of such "lifestyle" effects, and thus pockets of high (and low) cancer incidence.

Today, notes Greenberg, the general convergence of cancer rates *throughout* America is proceeding apace, as the lifestyle differences between U.S. cities and rural areas, between the Northeast and the Southwest, slowly fade. Cancer rates are rising in the industrial Northeast, but they are growing even faster in rural areas west of the Mississippi, including the Rocky Mountain states.

As long as individual Americans choose to put themselves at risk, Greenberg concludes, cancer will be no less a threat "on a mountaintop in Montana than on a street corner in Hoboken."

Of Mites and Men

"Getting Off the Pesticide Treadmill" by Michael Dover, in *Technology Review* (Nov./Dec. 1985), Massachusetts Institute of Technology, Room 10-140, Cambridge, Mass. 02139.

For more than 40 years, U.S. farmers have relied on synthetic pesticides to keep crop-eating bugs at bay. Dover, an ecologist formerly with the U.S. Environmental Protection Agency (EPA), argues that Mother Nature has cheaper and safer ways to get rid of agricultural pests.

To begin with, pesticide sprayings often create vermin troubles where none existed before. Wiping out certain predatory insects has allowed tobacco budworms in Texas and Mexico, for example, and spider mites in the Pacific Northwest to reproduce unchecked. Thanks to years of exposure, many pests have also become immune to pesticides. From 1970 to 1980, the number of "resistant species" of mites, ticks, and other insects jumped from 224 to 428—an upsurge that threatens U.S. cotton and potato farming.

American farmers are in a bind. They must simultaneously control insects *and* the use of insecticides. The solution, in Dover's opinion, lies in various "biological controls." One method—"inoculative release"—calls for breeding a pest's natural enemies. A more extreme

procedure, "inundative release," requires blanketing croplands with mature insects and microbes that attack parasites. Both systems work. During the 1940s, California farmers introduced *Chrysolina* beetles to kill off a range weed toxic to cattle. So far, the initial investment of $750,000 has saved farmers $100 million.

Dover notes that such "natural" methods often yield greater economic benefits than their synthetic counterparts. One World Bank study found that the benefit-cost ratio for inoculative release can be more than 100 to 1—compared with a 4 to 1 ratio for chemical pesticides. But to be effective, natural methods must be part of "integrated pest management" (IPM). Under the guidance of scientists at Texas A & M University, east Texas cotton growers now coordinate irrigation and planting times, plow under crop residues, and carefully monitor pest populations *before* resorting to pesticides. As a result, usable acreage has risen from 105,000 acres in 1970 to more than 235,000 acres today. Higher yields and lower production costs have generated an estimated $29 million in additional revenue since the program began.

Dover sees great potential in IPM. Although the Reagan administration cut funds for IPM research at the EPA in 1981, Dover argues that the U.S. Department of Agriculture ought to pick up the slack. Funds could come from a nominal sales tax of two cents per pound on pesticides. Raising an estimated $20 million per year, the tax could easily finance a substantial research program—considering that the EPA's total 1970–80 IPM research budget was only $19 million.

Toxins at Sea

"Incineration of Hazardous Wastes at Sea: Going Nowhere Fast" by Pamela S. Zurer, in *Chemical and Engineering News* (Dec. 9, 1985), 1155 16th St. N.W., Washington, D.C. 20036.

"Eleven years after the [U.S.] Environmental Protection Agency (EPA) officials declared the technology environmentally sound, ocean incineration of hazardous waste is not [yet] a commercial reality," writes Zurer, a reporter for *Chemical and Engineering News*. "There are many who think it never should be."

Among the critics are chemists and environmentalists who contend that EPA tests of the smoke produced during 1981–82 trial runs of ocean-going incinerator ships have been inadequate. They worry that some toxic wastes are escaping, unburned, into the atmosphere. And they argue that the EPA backed the high-seas solution chiefly because it seemed like the easiest course—four incinerator ships were available.

Such objections have some merit. Yet, faced with managing the disposal of some 250 million metric tons of toxic waste each year, the EPA must do *something*. Currently, most of the waste is stored in dumps. Roughly 25–35 percent of it is incinerated on land. Only one percent of the toxins are burned annually at sea. The EPA would like to raise that amount to 15 percent.

Some foes of offshore incineration would like to see more waste