

EDITORIAL COMMENTARY

Flunking the Peanut Butter Test

Most Claims That Chemicals Cause Cancer Are Bunk

DEREGULATION, one of the Reagan Administration's leading claims to fame, somehow has bypassed the huge U.S. chemical industry. Other businessmen may be freed from government control, but those whose products are labeled "toxic"—and just about everything has some degree of toxicity—each year come under increasingly stringent controls. That should surprise no one: Public fear of chemicals has probably never been higher.

By far the most potent fear in people's minds is that artificial chemicals cause cancer. Millions of Americans are convinced that they face a significant risk of the dread disease from the air they breathe, the additive- and pesticide-laden food they eat, and—especially—the water and soil around them, contaminated by seeping wastes from leaky storage tanks and chemical dumps. Anxieties were worsened last Wednesday by a headline-making report from the National Academy of Sciences, which said that under "worst-case" assumptions, residues from pesticides posed an alarming cancer risk.

Such concerns are vastly overblown. In a remarkable article, in the April 17 issue of *Science*, three Berkeley researchers, led by the eminent biochemist Bruce Ames, sum up the present-day scientific knowledge on the subject of cancer. Companion articles by other scientists in the same issue add more details. According to the reports:

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• America is not suffering from a "cancer epidemic." Once you factor out the advancing age of the population and the cases caused by smoking and overexposure to the sun, death rates from the disease are not rising.

• Most cancer is "environmental," in the sense that it's not hereditary. But that term covers tobacco, alcohol and drug use, viruses, fat intake, reproductive behavior and so on. Ordinary consumers face very little risk of cancer from industrial processes, and virtually none from food additives, pesticides, drinking water contaminants or nuclear power. General air pollution risks are minimal, with a year's worth of exposure to Los Angeles smog no worse than smoking two packs of cigarettes. On-the-job exposures are more serious, at least for the relatively few workers who encounter high concentrations, but there, too, the risks turn out to be far less than what was widely assumed 10 years ago.

• Radiation and toxic substances are important cancer risks, but in both cases the background levels found in nature dwarf the relatively small contributions of man. Most radiation exposure, for example, comes from elements like radon, the gas that seeps into basements, and altitude. (Denverites and frequent fliers absorb more cosmic rays.)

• The normal human diet is loaded with naturally occurring carcinogens. Aflatoxin, a very strong cancer-causer, results from mold on nuts and grains and is common in the human diet. The barbecue pit is another notable peril, along with browned and burnt meat in general, but the vegetable kingdom is scarcely benign: Plants generate toxins in high doses to ward off insect, animal and fungal predators. These natural pesticides often work by the same biochemical mechanisms as their man-made equivalents, and there is scant reason to assume that the one kind is much safer than the other: Of 390 suspect chemicals tested, 60% of the artificial and 45% of the natural chemicals were shown to cause cancer in rats or mice. Americans eat at least 10,000 times more of the natural pesticides, by weight, than of their artificial counterparts.

• Many compounds, though carcinogenic, are known to provide health benefits. They include a number of valuable drugs and several common metals that are essential to nutrition in trace quantities. Other carcinogens arise from the body's own metabolism. The culprit in the disease may often be the absence of anti-risk factors, rather than the presence of risk factors.

The Berkeley team devised an elaborate index to rank relative cancer risks for humans by reference to known risks in lab animals. They focused on actual likeliest-case risks, not the "worst-case" analysis publicized in the NAS study (which, if it were applied to natural carcinogens as it is to artificial, would make the natural risks seem truly astronomical).

Interested parties should check the details and caveats in the *Science* article, but, simplified, one could translate the index into a peanut butter sandwich test. Each such snack poses a tiny cancer risk (from aflatoxin in the peanuts) that can be called 1 on the scale.

By comparison, the allyl isothiocyanate in a teaspoon of all-natural brown mustard scores 2, or twice the cancer-causing potency of the peanut butter, while the hydrazines in a single raw mushroom score 3, as does the estragole in a one-gram pinch of dried basil.

What about the over-publicized hazards of the American diet? A 12-ounce can of saccharin-sweetened cola has a score of 2, same as the mustard. The nitrosamines in a helping of bacon are much less dangerous, at a score of 0.1, while the pesticide ethylene dibromide, which the Environmental Protection Agency saw fit to ban during a great officially triggered nationwide scare, is still more innocuous by a factor of eight: for the average consumer of grain products, two and a half months' worth of exposure before the ban was about as hazardous as one peanut butter sandwich.

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Remember the panic when polluted wells in Silicon Valley were closed down as unsafe to human health? It turns out that a liter of water from the worst of them was only an eighth as hazardous as the peanut butter. Water from wells in Woburn, Mass., site of another memorable scare, was 10 times safer still. Ordinary tap water, with its slight residue of chlorination, is on average far more carcinogenic than either source.

Most of these conclusions are not really new: investigative journalist Edith Efron told the story three years ago in her book *The Apocalyptic: Cancer and the Big Lie* (Barron's, March 16, 1984). Another writer ahead of his time was the late William Havender, the biochemist whose untimely death last month was a great loss for sensible science policy. But it took a while for the work of Ames and others to find its way into popular health columns.

Now that it has, the implications for public policy are profound. Time and again, federal regulation has gone to extremes of expense and coercion to attack what now seem trivial risks. The famous Delaney clause, for example, bans all additives linked to cancer in rats, however weak the link and however strong the substance's benefits. Such laws can actually increase overall risk by driving society to less safe alternatives.

Similarly, when fumigants are restricted, the risk of mold toxins rises, and farmers start breeding plants for better insect resistance, which often

means higher toxicity. When cyclamates are banned, people consume more sugar instead. When nuclear power is stalled, more wood and coal get burned (at a much higher toll in deaths per BTU) and people seal more radon and other carcinogenic fumes into their houses by weather-stripping.

Regulatory excess may have lost its rationale, but the thrust persists: demands for virtual bans on common substances like formaldehyde (it occurs naturally in many foods, and substitutes for it carry risks that are not well understood), as well as looming political gridlock on chemical and nuclear waste, with all possible methods of disposal—incineration, land burial, ocean burial—blocked by one or another pressure group.

As usual nowadays, most of the action and even more of the money is to be found not in regulation, but in litigation, where the "toxic tort" suit against big business is being perfected by the plaintiffs' bar. Such suits follow a simple model: 1) find a community or group with a "cluster" of health problems; 2) find a substance to which they have arguably been exposed; 3) sue the maker or user, and collect money; 4) see 1).

There is nothing inherently wrong with this inferential approach to identifying risks: genuine epidemiology (as opposed to the pop variety) has revealed real links like asbestos/mesothelioma and vinyl chloride/angiosarcoma among heavily exposed workers. The fudge factor comes in when the diseases are varied and ill-defined, the clustering of the kind that can occur by chance, the exposure low-level, and the causal link one that can't be verified by the experience of groups exposed to higher concentrations.

Consider the latest big toxic-tort suit, in which residents of the Denver suburb of Friendly Hills are claiming that contaminants escaped from a Martin Marietta plant six miles away and caused cancer and a variety of other diseases among their children. According to the Times's account of April 19, state health statisticians found no excess child mortality in Friendly Hills; EPA tests showed no pollution of the local water; there's no evidence that major contamination ever escaped from the Martin Marietta plant; and the plant's watershed is part of a different water system, where no health problems have been reported, and which is linked to the Friendly Hills system only by a conduit used for occasional water-sharing.

More and more companies, fearful of high legal costs and nasty publicity as well as unpredictable juries, are coughing up large sums to settle lawsuits whose merits are not much more apparent than those of the Friendly Hill suit. In the Agent Orange case, Judge Jack Weinstein approved an estimated \$200 million settlement, even though he said the evidence failed to show that the manufacturers were responsible. And each round of settlements tends to lead to another round of lawsuits. Isn't it time reason prevailed?

—Walter Olson

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Natural Resources
Defense Council

News Release

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TOXIC AIR POLLUTION REQUIRES TOUGH NEW FEDERAL POLICY

STATEMENT BY JOHN H. ADAMS for NRDC

Literally billions of pounds of dozens of toxic compounds are emitted into the air, both from "routine" events and "accidents" each year. As a result of this toxic air pollution, according to the EPA's own estimates, thousands of people endure emergency evacuation from their homes, are killed, become ill, or are injured each year. We must not wait for a catastrophic accident, for an American Bhopal, before we act. It is time to stop putting the lives of millions of Americans in jeopardy. It is time to stop treating the atmosphere as a hazardous waste dump.

For too long, the EPA has approached toxic air pollution as if this level of human grief were somehow inevitable and had to be weighed against the cost to industry of controlling these emissions. The public rejects a government policy of cost-benefit analysis and "acceptable risk" when matters of life and death are concerned.

If we simply treated our air the same way we treat our food we would be much better off. When someone wants to add something to our food, we insist that they demonstrate it is safe to eat. Our air deserves no less protection.

The sources of this pollution range from hundreds of chemical plants which pose great danger to the most exposed plant neighbors, to thousands of chemical-using and fuel-burning sources, to millions of motor vehicles, which together create a deadly "urban soup" of toxic chemicals. In the face of a vast number of potentially

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deadly agents the regulatory policy must be comprehensive. In 17 years, however, EPA has done very little to control these pollutants, having set even marginally protective emission standards for only seven hazardous substances.

The agency's interminably slow pollutant-by-pollutant approach should be replaced by standards for classes of chronic toxic pollutants emitted from categories of pollution sources. For acute toxic hazards, most dangerous in accidents, Congress should establish a "no release" objective. Certain chronic toxic solvents should be subject to a scheduled phase-out and replacement by safe substitutes. Municipal waste incinerators and vehicular sources must also be brought under a strict regime of specific standards for toxics and dangerous metals.

NRDC will continue to pursue the avenues of litigation and legislation until a responsible policy is in place to protect us from the danger of toxic air pollution.

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Toxic Air Pollutants

The national toxic air pollutant control program should be refocused on controlling toxic pollution from all its sources, from chemical plants to automobiles, and from "routine" emissions to "accidents."

For major industrial sources, Congress should:

- o require EPA to set emission standards for classes of pollutants (such as volatile organic compounds and products of incomplete combustion), and require state-of-the-art pollution controls immediately on newer sources and within 10 years on all sources;
- o prohibit use of cost-benefit analysis (weighing lives against industry costs) in choosing control requirements;
- o improve emissions inventories and right-to-know provisions to cover short-term releases, and establish requirements to prevent catastrophic releases.

To control emissions as products are used, Congress should:

- o require EPA to reduce toxic emissions by 90% overall from "area" sources such as chemical users in five years, and give chemical producers and distributors responsibilities to help ensure compliance by their small business customers;
- o establish an objective of no releases, by a set future date, for the most acutely toxic air pollutants and for chronically toxic solvents.

For municipal incinerators, Congress should:

- o require state-of-the-art emission controls for all pollutants from new and existing municipal incinerators;
- o require EPA to set special health-protective standards to protect against the build-up of lead in the blood of the exposed population and the level of dioxin in mothers' milk;
- o require enforceable commitments to all feasible alternatives to incineration, including recycling and waste minimization.

For mobile sources, Congress should:

- o set stringent standards for diesel particulate;
- o establish a fuels program that would ban lead in gasoline completely and ban other toxic fuel additives, reduce gasoline volatility, reduce sulfur in diesel fuel and promote the use of alternative fuels.

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Air Coalition