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Each Year New Substances Slip Into the Environment

Carcinogens: Unchecked, They Threaten An Epidemic

By JANE E. BRODY

Cancer invariably arouses fear and anger when it strikes, but society has done very little to control the thousand or more substances in the environment that are thought to cause from 60 to 90 per cent of the nearly 700,000 cases of cancer in the United States each year.

As scientists uncover incriminating evidence about more and more chemical and physical substances to which huge segments of the population are exposed, and with hundreds of new substances introduced untested into the environment every year, it is becoming increasingly clear that something must be done. If it is not, there could easily be "epidemics" of cancer in the future.

The ban last week on the production of aldrin and dieldrin, two widely used farm pesticides, suggest that the Government may take a stronger approach to the problem in the future. Principles of action have been set that could become the format for dealing aggressively with other environmental carcinogens (cancer-causing agents).

There already is an epidemic of lung cancer because society failed to recognize the insidious hazards of cigarettes some 50 years ago. Unlike cigarette smoking, however, exposure to other known and suspected carcinogens in the environment is involuntary and unknowing, constituting what some scientists regard as a gargantuan experiment on uninformed human guinea pigs.

Hazards Get Attention

In recent weeks, in addition to aldrin and dieldrin, several potential hazards have received public attention, notably asbestos, arsenic and vinyl chloride.

Low-level exposure to asbestos, a common contaminant of air, food and water, has been linked to the development some 30 years later of a rare cancer, mesothelioma, in the children of former asbestos workers. Arsenic, recently shown to cause cancer of the lung and lymph system in exposed workers, had previously been found in many public water supplies in amounts exceeding Federally set limits. The limits now may be revised downward.

Last week the Department of Labor announced final rules designed to reduce worker exposure to vinyl chloride, a chemical widely used as a basic material in the manufacturer of plastics. The chemical has been shown to induce incurable cancers of the liver in some workers exposed to it over substantial periods of time.

The Environmental Protection Agency's action on aldrin and dieldrin is generally regarded as a significant precedent in dealing with cancer-causing agents. It argues that a ban on carcinogens need not await the demonstration of cancer in people exposed to the pesticides.

In a ruling culminating hearings on the two chemicals, E.P.A. administrative law judge Herbert L. Perlman said, "It would be irresponsible in the extreme to pursue such a course." It must be remembered, he added, that carcinogenesis is an irreversible process with a time-bomb effect: a long period elapses between exposure and the development of cancer.

Judge Perlman said there is no way of determining a "safe" level of a carcinogen since, theoretically, any amount is capable of producing disease in highly susceptible individuals. Dieldrin, into which aldrin degrades, has been shown to cause cancer when fed to mice at dietary levels commonly found in human tissues and sometimes in human foods.

The problem that remains, however, is how to test existing and new environmental agents to obtain a realistic estimate of their cancer-causing potential in man.

Since for reasons of ethics and time such tests cannot be performed in man, other less exact methods must be used. Even tests on laboratory animals are impractical for screening the estimated 10,000 or more agents that should be subjected to such tests. Testing of each substance would take approximately three years and cost about $70,000 each.



Testing a cancer culture.

Therefore, scientists are turning to faster and less expensive "early warning systems." One is the laboratory cell culture, which a chemical carcinogen can "transform" to cancer-like cells in approximately two weeks. When the transformed cells are injected into animals, they can produce malignant tumors in 18 weeks.

Another system, developed by Dr. Joseph DiPaolo of the National Cancer Institute, involves injecting the substance into pregnant animals and analyzing the fetuses for transformed cells.

There is no general agreement among scientists on the best way to test for carcinogenesis. In some cases, a laboratory demonstration of cancer-causing properties may have no relevance for man; in others, negative test findings may give false assurance of safety.

But there is little disagreement that a start must be made and made now. An editorial on environmental carcinogenesis in the current issue of the British medical journal, The Lancet, states, "We cannot have new products without risk, but it is irresponsible to permit new products without assessment of their effects."

Beyond testing, there remains the problem of what to do about a known or suspected environmental carcinogen. The cancer-causing effects of asbestos were established two decades ago, but this year a United States Court of Appeals said it was all right for some 100,000 residents of Minnesota to drink asbestos-containing water because it could not yet be shown that any of them had gotten sick as a result.

As a pragmatic approach, Marvin A. Schneiderman of the National Cancer Institute recently suggested the following: Ban those materials known to cause cancer in man; hold in abeyance those substances that cause cancer in animals until enough is known about how man's body processes them to show that they are not a human hazard, and use with great care those that cause genetic changes or birth defects in laboratory tests.

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