

A better test for carcinogens

A team of researchers from New Orleans has developed a new and quicker way to test for carcinogenic compounds. The technique has already been used to confirm the existence of chlorinated organic compounds, some carcinogenic, first detected in that city's "clean" drinking water last year (SN: 11/16/74, p. 311). The team also tested samples of human blood plasma from city residents and found potentially damaging compounds in them, too.

Biologists Betty Dowty, Douglas Carlisle and John L. Laseter of the University of New Orleans and James Storer of Louisiana State University School of Medicine report the technique and tests in the Jan. 10 *SCIENCE*. They collected the volatile organic compounds from water and blood on a solid phenyl ether polymer and analyzed them by gas chromatography and mass spectrometry. They found 13 halogenated hydrocarbons in the water samples and five in plasma from 21 residents. Tetrachloroethylene and carbon tetrachloride were found in both. The latter, besides being a suspected carcinogen, was found in substantially higher concentrations in the blood than in the water. This is evidence, they state, that the chemical may be bioaccumulated in humans. This is not surprising, they state, considering the tendency of the compounds to bind to lipids.

The Environmental Protection Agency has chosen 80 cities and will begin a nationwide water quality survey this month. An EPA chemist told *SCIENCE NEWS* the new analytical technique is better qualitatively than many now used, but that there will be "no time" to learn the technique before the nationwide survey begins.

Vinyl chloride is a downer, too

Researchers have been trying to unravel the vinyl chloride mystery ever since its toxic effect on humans was so tragically demonstrated. A team of Harvard University researchers, headed by Rudolph J. Jaeger, reports in the Dec. 20/27 *NATURE* a new clue to the simple molecule's disastrous effects at the cellular level.

The team found that rats pretreated with phenobarbital, a depressant drug, were susceptible to liver damage at half the exposure level of the untreated rats. One animal sustained injury at one-twentieth the exposure level. Vinyl chloride monomer is suspected of interacting with a cytoplasmic liver enzyme system which activates the chemical into a liver toxin. The work tends to confirm this interaction, since phenobarbital is an inducer of these enzymes.

Besides providing basic information on vinyl chloride at the cellular level, the finding has a more immediate implication. Jaeger says if he were a vinyl chloride worker, he wouldn't drink or take "downers" before work.

More to this than meets the ozone

Supersonic transports and fluorocarbon aerosol can propellants have at least one thing in common: They are both suspected of destroying ozone in the earth's upper atmosphere, which would allow more damaging ultraviolet light to reach the earth's surface. In studying this problem, scientists must keep a few things in mind, caution IBM researchers Paul Halpern, J. V. Dave and Norman Braslau in the Dec. 27 *SCIENCE*. They have developed several computer models which show that tiny dust and chemical particles and cloud droplets can significantly reduce the amount of ultraviolet radiation reaching the earth. This must be considered, they state, in studies on pollution and the ozone layer.

January 18, 1975

How much oil is spilled?

Because of its size and complexity, no one knows exactly how much spilled oil the ocean has absorbed or how much it can take before serious damage is done. Estimates of contamination run from five to ten million metric tons a year and judgments of the resulting damage range from none at all to catastrophic. The Ocean Affairs Board of the National Research Council has now weighed in with its estimate, but surrounded it with appropriate hedging and a plea for more research.

The board favors the conservative estimates: total contamination of around 6.1 million tons a year and severe ecological effects only in localized areas. More than two-thirds of the petroleum entering the ocean environment comes from transportation and river and urban run-off, they conclude, compared to only 10 percent from natural seepage. The greatest damage occurs among seabirds and benthic (bottom dwelling) plants and simple animals. "The effect of oil contamination on human health appears not to be cause for alarm."

The researchers emphasize, however, that "our knowledge is grossly inadequate." Specifically, they could not determine whether petroleum that does not evaporate or wash up on beaches as tar is rendered harmless by microorganisms capable of oxidizing the hydrocarbons. Neither could they conclude whether detergents should be used to disperse oil slicks, because no one yet knows if these are finally degraded or just spread toxic effects over a greater area.

Weeds that eat pollution

Long considered a nuisance that clogs waterways, the water hyacinth, a common subtropical floating weed, may have found a valuable new role. Its long trailing roots absorb many potentially dangerous materials in the water, and NASA scientists at the National Space Technology Laboratories in Bay St. Louis, Miss., are experimenting with beds of the plant in order to produce a natural filtration system for removing pollutants from industrial and residential sewage. The plants can also be harvested for fuel and animal feed.

Already a final filtration system using the plants is in operation to remove chemical wastes from the NASA facility's effluents. Hyacinths rapidly absorb heavy metals such as cadmium, mercury and lead, as well as hazardous chemicals, including insecticides, phenols and phosphates. Since an acre of the prolific plants can produce some 525 pounds of dry harvested material a day (a hyacinth community doubles every two weeks), new uses for the gathered material are being sought. The plants can be fermented or chemically decomposed to form "bio-gas," a fuel similar to natural gas. Or, if only domestic sewage free from toxic metals is used, the vegetation may be suitable for animal feed.

The acres-large lagoons and warm conditions required by the hyacinths limit applicability of the new pollution control system to tropical and subtropical areas.

Gasohol: One for the road

To help meet the energy crisis, Nebraska is buying ethyl alcohol and other by-products of pulp mill waste liquor from the Georgia-Pacific Corp. to mix with gasoline for a fleet of state cars and trucks. They call the mixture, containing 10 percent ethanol, "gasohol."

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