

ENVIRONMENT

Controlling lead in the environment

Lead in the Environment is a 272-page National Science Foundation report describing recent research and findings by three large universities. Among its conclusions it reports that:

- Experiments suggest that lead alkyls may be absorbed by the surface of atmospheric particulates. Therefore, dust may "act as a scavenging mechanism and serve as a substrate for the conversion of the absorbed lead species into solid, inorganic lead compounds."
- Because lead concentrates most on the smallest particles, they constitute the "greatest human health hazard as they are the ones most likely to be inhaled and retained within the lungs."
- The amount of lead found in dust on rugs and floors in the home "may be sufficient to create a health hazard for small children."
- And although the reason why "is largely unknown," dissolved lead salts are generally toxic to algae and some fishes. In several cases, however, toxicity "is hypothesized to result from lead induced precipitation of essential anions, or in fish from reactions of lead with the mucous surface of the gills."

David Hawkins, the Environmental Protection Agency's assistant administrator for air and waste management, says 90 percent of all atmospheric lead pollution results from burning leaded gasoline, another 5 percent from large, stationary sources such as industrial smelters. Emissions and clean-up studies described in the report focus on both.

Since the report's publication, EPA has proposed standards for fugitive (nonsmokestack) emissions by copper and lead smelters. EPA would require that ambient air levels not exceed 1.5 micrograms of lead per cubic meter by 1982. An enacted EPA standard to reduce lead in gasoline to 0.5 grams per gallon by 1979 is discussed in the report. "Although obviously effective," the report says the standard is based on the "simplistic... solution that assumes a linear relationship between gasoline lead and human exposure." But this may not be valid "due to the reentrainment of lead-bearing dust, especially in urban areas," it says.

Government tests for tainted "pot"

Richard Hawks of the National Institute of Drug Abuse is testing samples of Mexican-grown marijuana for paraquat — a very poisonous herbicide used to destroy marijuana crops that otherwise might end up in this country. Of 45 samples tested, six contained paraquat. Ingesting only 0.2 ounces could be lethal, Hawks told *SCIENCE NEWS*, although it's estimated that one would have to ingest at least a pound or two of marijuana in six or eight hours to receive the lethal dose. Because the chemical breaks down under low heat, Hawks says it is not expected that smoking contaminated "pot" will cause illness.

Oyster births down in Maryland

Since 1965, natural oyster reproduction in Maryland's Chesapeake Bay is running 72 percent lower than the average rate for the previous 27 years, according to *MARYLAND SEA GRANT*, a newsletter of the University of Maryland. The change is measured in spat set, a gauge of oyster reproduction. A spat is an oyster larva that has stopped swimming and begun to grow its own shell. Only one percent of the larvae become spat; the rest are eaten or die. Scientists at the university's Horn Point Environmental Laboratory don't know why the drastic dropoff occurred, but they speculate that human pollution, oyster disease and herbicide kills of aquatic plants that produce food and shelter for oysters might be responsible. New ways are under development to increase spawning and ratios of larvae to spat.

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PHYSICAL SCIENCES

From the Acoustical Society of America meeting at Miami Beach, Beach.

Ticked to hear you

Conventional hearing aids can help many people with auditory impairments. But those with totally disabled hearing, that is, people with completely nonfunctional inner ear mechanisms, get little but vibrations from hearing aids. To help the total disability cases, an interdisciplinary group at the Applied Physics Laboratory of the University of Washington in Seattle directed by David W. Sparks has developed an apparatus that translates speech to tactile sensations.

The person who wishes to speak to the wearer of the device talks into a microphone. The output of the microphone is fed to a computer that processes it the way the ear processes speech. The computer's output consists of patterns of electrical impulses, a different pattern for each sound, and these patterns are delivered to the deaf person's skin by 288 electrodes in a belt worn around the abdomen. The electrical impulses are too weak to be dangerous or painful.

Sparks reports that the experiment shows that deaf people can learn to distinguish the patterns of electrical impulses and thus assimilate the information contained in the speech. Deaf people can also use the device to monitor their own speech.

Giving red blood cells a lift

Acoustic levitation is not some mysticism performed by a swami or a guru. It is a laboratory technique for suspending liquid and quasiliquid samples in a balance between gravity and acoustical forces. The sample is introduced into a column of a host liquid, and the acoustical forces are supplied by a transducer which sets up a standing ultrasound wave in the column. This provides alternating locations of high and low sound pressure. The experimental samples will migrate to regions of higher or lower pressure depending on their density and elasticity. Robert E. Apfel, Mary Ann Haltiwanger and Victoria Wagner of Yale University point out in their report that although the density of such samples can be measured by other means there has been no routine method for measuring the elastic properties.

Apfel, Haltiwanger and Wagner first used the method for testing various laboratory liquids. Now they have gone on to biological samples, most recently to red blood cells.

The red blood cells are suspended in a saline solution, and when the ultrasound is turned on, they migrate into a series of bright red bands separated by clear bands of saline solution. "We must now develop tools for precisely locating these bands so as to predict quantitatively the elastic properties of the cells," the three investigators write. When it is fully developed, they believe their technique will become a means for routine analysis of small biological samples.

Zen and the sound of motorcycle noise

A gang of Hells Angels swooping down out of the hills in V formation may thrill Hunter Thompson, but it is likely to make most people apprehensive. Indeed, John Walsh of the U.S. Suzuki Motor Corporation reports that when Suzuki did a survey of public attitudes to traffic noise, they found motorcycles high on the list of complaints. Motorcycles tend to be the noisiest single vehicles on the road, but they make up only about one percent of the vehicles in traffic. The complaints were out of proportion to their numbers and seemed to concentrate on only certain motorcycles. Suzuki interprets this to mean that not only should motorcycles be designed to be quieter, but that somehow the public should be made less apprehensive about their riders.

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