The most common pollutants found in water are organic solvents: trichloroethylene, ethyl benzene, perchloroethylene, and so on. In the home, water is exposed to the air by many activities (bathing, showering, flushing toilets, washing clothes, washing dishes, cooking, and so forth). During these activities, organic solvents can be transferred from water to air. Furthermore, many common household products contain organic solvents (paints, varnish, glues, cleaning compounds). It is therefore no surprise that organic solvents can be measured in indoor air, often at levels higher than those found in outdoor air. In many workplaces, exposure to organic solvents is high and is more or less constant.

A recent study, published in the AMERICAN JOURNAL OF PSYCHIATRY (November, 1988), of the effects of organic solvents on the human nervous system gives such a clear picture of the problem that we will quote it at length. Because the language in the original article is laced with medical terms, we have tried to provide some translations:

"Because organic solvents have a special affinity [attraction] for lipid-rich tissues [fatty tissues], including brain tissue, they have been implicated in producing a wide range of somatic [physical] and neuropsychiatric [mental, or nervous system] symptoms.

"It is not uncommon for adults exposed to solvents to report increased forgetfulness, difficulties concentrating, depressed affect [feelings], heightened irritability, dizziness, motor incoordination [uncordinated movement], and weakness in the extremities [hands, feet, arms and legs]. While it is generally believed that this reduction in physical and mental efficiency will clear spontaneously several hours or days after the individual is removed from the exposure source, many individuals—particularly those who have had multiple episodes of 'solvent intoxication'—complain that their problems have not disappeared despite the fact that their last exposure occurred several months earlier.

"Objective evidence of neuropsychiatric impairment has been provided by several recent epidemiologic and clinical studies. Using structured psychiatric interviews and behavioral checklists, investigators have noted that when compared with control subjects or published norms [average behavior], solvent-exposed workers report more fatigue, tension, irritability, mood changes, and difficulty with memory and concentration. On standardized neuropsychological [nervous system] tests, solvent-exposed workers have been found to perform more poorly than control subjects on measures of reaction time, memory, abstract reasoning, visuospatial ability, manual dexterity, and perceptuomotor speed."

In short, there is abundant evidence that occupational exposure to solvents can fry your brain and nervous system.

One complaint frequently voiced by individuals exposed to solvents is a medical condition called parosmia, which is a perceived change in the sense of smell. Often such people not only report that their sense of smell is altered, but they also complain that certain substances smell extremely unpleasant. Such individuals find that certain odors, which they would usually consider neutral or mildly unpleasant, such as hair spray, gasoline, or perfumes) are exceedingly disagreeable. For some unknown reason, such people have developed a great sensitivity ('hypersensitivity') to certain odors, a medical condition known as cacopsmia. This unusual sensitivity to odors is often accompanied by headaches, dizziness, and feelings of nausea so strong that affected individuals make a concerted effort to avoid repeated exposures to those substances thereafter.

Now a formal scientific study of blue collar workers has confirmed that smell hypersensitivity is associated with poor performance on standard mental and physical tests. Two groups of blue collar workers, one who had been exposed to solvents, and one who had not, were matched for age, level of education, and general intelligence. Each group submitted to a series of tests for hand-eye coordination, learning and memory, attention span, and other measures of nervous system function. The solvent-exposed group performed more poorly on many of the tests, compared to the non-exposed group. Those members of the solvent-exposed group who reported experiencing nausea after contact with certain odors performed most poorly on tests of verbal learning and visual memory ('Describe the details of the picture I just showed you.'). The authors of the study say the tests do not PROVE it, but the test results are consistent with a diagnosis of actual brain damage to the odor-hypersensitive workers.

A word to the wise: When someone says there's "no immediate risk" from exposure to solvents in your water supply, or the air inside your home, they are talking about a cancer risk only. We know of no standards for low-level exposure to solvents that are designed to protect your brain or your central nervous system. Do we want to raise a generation of children drinking and breathing small amounts of cleaning fluid day after day? We do not.

Get: Christopher Ryan and others, "Cacosmia and Neurobehavioral Dysfunction Associated With Occupational Exposure to Mixtures of Organic Solvents." AMERICAN JOURNAL OF PSYCHIATRY, Vol. 145 (November, 1988), pgs. 1442-1445. For a reprint, contact Dr. Ryan at Department of Psychiatry, Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine, 3811 O'Hara Street, Pittsburgh, PA 15213; phone (412) 648-9641 and ask for Dr. Ryan's office.

--Peter Montague

HALF OF PLANT AND ANIMAL SPECIES WILL BE EXTINCT IN 50 TO 100 YEARS

Life appeared on earth about 600 million years ago, according to fossil records. New types of plants and animals evolved in response to changing conditions. Today, somewhere between 5 million and 50 million different species exist on earth. Biologists from all nations have recognized the existence of only 1.5 million species, in the sense that they have been given Latin names. In many cases, even named species have not been studied in any detail.

The best estimate is that half of all species now living on the planet will become extinct in the next 50 to 100 years as a result of human activity, according to Princeton University's Dr. Robert May (now moved to the faculty at Oxford University in England). [See SCIENCE magazine Vol. 241 (September 16, 1988), pg. 1448.]

The loss of species affects us all in very practical ways. The planet earth is an exceedingly complex machine with all its parts interrelated and interdependent. You can compare it to a TV set (though a TV set is vastly more simple). Killing a species is like ripping a transistor out of a TV set, hoping to improve the set's performance.

More than 95% of all pharmaceutical drugs in use today were produced by nature and discovered by humans—they were not invented by humans. Loss of species will rob our children of nature's storehouse of biological inventions. Before our children have even had an opportunity to find out what benefits might be derived from most species, they'll be extinct, gone and, with them, whatever benefits they held.

--Peter Montague

Descriptor terms: trichloroethylene; ethyl benzene; perchloroethylene; health effects; nervous system disorders; risk assessment; studies; biodiversity;