

Air conditioner that stores cold

Energy shortages in the United States sometimes are caused not by the total demand upon energy resources but by the high-peak demands at certain times, such as when air conditioners are run continually during hot spells. There are ways of storing electrical energy during low-load periods—such as pump-back storage reservoirs—but environmentalists have been increasingly successful in opposing these as being just as environmentally damaging (by defacing scenic areas, for instance) as power generation facilities.

Working under a National Science Foundation grant, researchers at the University of Pennsylvania's National Center for Energy Management and Power have designed an air conditioner that stores cold.

The air conditioner is essentially a conventional unit, with one major addition—a thermal energy storage material. As the unit runs, refrigerant from its evaporator passes over a structure containing eutectic salt hydrates, crystals that freeze solid at 55 degrees F. By running the air conditioner during off-peak hours, the frozen crystals build up. Then, during hot periods of the day, the air conditioner's compressor is supplemented by the coolness stored in the crystals.

Mercury in San Francisco Bay

There are about 58 tons of mercury in the upper foot of sediment in San Francisco Bay, according to U.S. Geological Survey researchers. Core samples indicate the rate of deposition has increased recently, they add.

David McCulloch, a marine geologist, headed the USGS study of mercury in the bay sediments. He reports that amounts ranged from 20 to 2,000 parts per billion in most sediments—with a single high value of 6,430 ppb in one sample. The highest concentrations were in natural and artificial tributaries and close to shore. Intermediate concentrations were in shoal areas, and lowest concentrations in channels.

There was no effort to identify sources. But the higher levels along the margins of the bay and in upper layers of sediments indicate a manmade rather than natural source for much of the mercury. No effort was made to identify compounds in which the mercury occurred. Next step, say the researchers, is to study the biological interactions of the mercury.

Fluoride and bone abnormalities

Chronic exposure to hydrogen fluoride causes teeth and bone abnormalities in hamsters, Dr. Frank W. Adams of Oregon State University reported at an American Chemical Society meeting in Bozeman, Mont. Hydrogen fluoride is emitted into the air from industries manufacturing phosphates, metals, porcelain and those that use soft coal as a fuel.

Dr. Adams found that fluoride in bone tissues is cumulative—up to as high as 8,000 parts per million in some of the adult hamsters he worked with. Growing animals do not accumulate fluoride to the same degree as adults, but newborn infants reflect the fluoride levels of their mothers, he adds.

Despite the teeth and bone abnormalities, the general well-being, longevity and litter sizes of the fluoride-exposed hamsters were little affected.

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Health complaints linked to pollution

A team of student researchers at Stanford University has established clear-cut correlations between air pollution levels and the number of students with respiratory complaints.

The incidence of colds, pharyngitis and gastrointestinal flu increased on warm, sunny days when air pollution levels are higher than on windy or rainy days, reports William H. Durham, who headed up the 48-day study for the Stanford Workshops on Political and Social Issues. The National Science Foundation provided a grant for the study.

On low pollution days, the incidence of bronchitis and severe respiratory infections was higher. Thus these conditions are probably more associated with cold and wind than with pollution, says the study. Bronchitis also appeared to be frequently associated with smoking.

The study was carried on with 5,401 student-patients who sought care at student health services. Because health care is covered under tuition and fee benefits, students usually do not hesitate to seek medical aid, says Durham. Thus the study is likely to be more inclusive than a similar one for the general population.

Air pollution and psychological disorders

A Connecticut allergist has found what he says are direct cause-and-effect relationships between certain air pollutants and various neurological and psychological disorders usually considered psychogenic, according to the July 5 BEHAVIOR TODAY.

Dr. Marshall Mandell says he placed patients in a controlled clinical environment, then introduced various pollutant compounds such as coal tar derivatives.

Dr. Mandell claims the pollutants as well as other allergens, have precipitated epileptic seizures, depression, anxiety and stammering. All of these are symptoms the same patients had earlier complained of.

Dr. Mandell reported he is having trouble financing his nonprofit clinic because the medical profession is skeptical of allergenic etiology. "There are millions of sick people with diseases not understood by the overwhelming majority of physicians," says Dr. Mandell.

Pollution and national ideology

Is environmental destruction an outcome of industrialization, *per se*? Or is the type of economic system that manages the industries a factor?

Soviet scientists insist the latter is the case. Prof. V. S. Semenov of the Moscow Institute of Philosophy is quoted in the July UNESCO COURIER to the effect that a socialist state can spell out objectives for social action according to priorities set by scientific planning—and thus is much more flexible than a capitalist state in meeting pollution abatement goals.

But Prof. Erik Dahmen of Stockholm, quoted in the same article, says there is "no evidence whatever" that different economic systems perform differently in pollution control. And Prof. Marshall Goldman of Wellesley College in Massachusetts cited massive fish kills due to pollution in Soviet waters, and a significant reduction in the level of the Caspian Sea, to make his point that "industrialization, and not private enterprise, is the primary cause of environmental degradation."