

three of these individuals have liver damage whose only probable cause was the toxic soot. Other persons exposed to the toxic soot had skin rashes, skin cancer, and other problems, but not all of these could be definitely attributed to exposure to the soot.

STATES

The Atlantic Richfield Company plans to build a major oil exploration staging base on Alaska's St. Matthew Island, 250 miles from the Alaskan mainland. At present the island provides a home for 1.5-5 million seabirds, and 22 species of marine mammals feed along its shores. It has been a wildlife refuge for nearly 75 years and a wilderness area since 1970. The Department of the Interior has agreed to withdraw refuge and wilderness protection for 4000 acres of the island. The oil company intends to build living quarters for 250 people and two mile-long runways on the island as well as constructing a deep-sea harbor. The National Audubon Society and a coalition of conservationists, fishermen, and Alaskan natives have filed a suit against the action taken by the Interior Department.

Extensive monitoring took place in the Adirondacks (N.Y.) over a two-week period in August. Analyses for pH, conductivity, and calcium were carried out for 155 remote lakes and ponds, 91 of which had not been tested in the past eight years. About 40 of the lakes are "control" waters that are checked on an annual basis. Henry G. Williams, New York State Commissioner of Environmental Conservation, said that 1047 Adirondack lakes and ponds have been sampled since 1975 and that 19% of these waters "are critically acidified with a pH below 5." Most of these either lack fish populations or have greatly reduced numbers and diversity of fish.

A \$3.4-million study of contamination in the New Bedford, Mass., area has been initiated by EPA under the Superfund program. The New Bedford area "is like no other hazardous waste site in our country, and extensive complex studies are needed before final remedies can be developed," said Michael R. Deland, regional EPA administra-

tor for Region I. An accelerated study will be undertaken of PCB hot spots in the Acushnet River Estuary, monitoring of PCBs and other pollutants will be carried out near Sullivans Ledge (a former quarry used as a dump site for unknown materials), and the quarry and the New Bedford landfill will be characterized hydrogeologically. Also, the sediment water and organisms in New Bedford Harbor and Buzzards Bay will be studied.

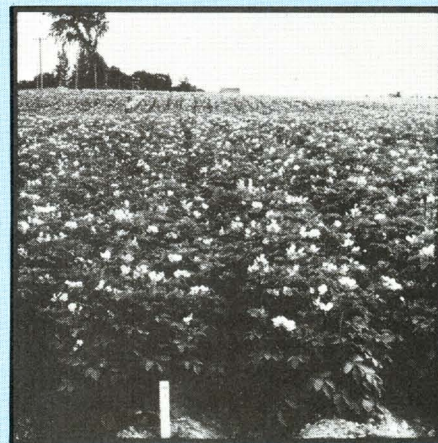
The state of Florida has passed a strict law to protect water quality, the Water Quality Assurance Act of 1983. A large part of the expenses incurred by the act will be financed by a trust fund. When the fund falls below \$3 million, an automatic 2¢-per-barrel tax on pollutants will be levied to build up the fund to \$12 million. The water act has several provisions that are unusual in state law. It prohibits hazardous waste landfills, requires construction of a multipurpose hazardous waste facility, and directs the Florida Department of Environmental Regulation to set up a monitoring network for groundwater quality.

SCIENCE

"There have been no confirmed human deaths from dioxin [2,3,7,8-tetrachlorodibenzo-*para*-dioxin]. Nor has it been shown to cause cancer, birth defects, or spontaneous abortions," says Fred Tschirley, a toxicologist at Michigan State University. He adds that the characterization of TCDD as "the most toxic substance ever made" is "correct for guinea pigs, not humans." He chided the popular press for not having made distinctions between effects on guinea pigs (or other small mammals) and on humans. Tschirley maintains that TCDD is produced by wood burning as well as by herbicide making, has been around "for centuries," and is detected now because of modern, sophisticated analytical instruments.

A new toxicology building has been opened by Battelle—New England at its oceanfront complex at Duxbury, Mass. This will enable Battelle to expand activities in aquatic toxicology and marine geochemistry to meet growing industrial and government needs. Analytical and

environmental chemists will use the facility to isolate, identify, and quantify potentially toxic and hazardous chemicals in marine, estuarine, and freshwater environments. Researchers will be able to expose aquatic organisms to various pollutants under natural conditions and then analyze the effects. A special feature is an ultraclean laboratory for analyzing trace metals.



Frost resistance may be improved

For the first time in a controlled experiment outside the laboratory, genetically engineered bacteria will be released to the environment. As soon as potato plants sprout above the ground, they will be sprayed with genetically altered bacteria. The experiment will take place at Tulelake Field Station in California. The leader in this research, Steven E. Lindow of the University of California at Berkeley, found that frost nuclei are produced primarily by *Pseudomonas syringae*, an otherwise harmless bacterium. When the gene that is the key to frost nuclei is removed from this bacterium, it prevents frost from forming. Researchers hope that spraying the potato plants with these altered bacteria will enable them to resist frost damage down to 21 °F.

What hazardous components might there be in geothermal wastes?

EPA (Cincinnati, Ohio) engaged Acurex Corporation to find out. Samples were collected at The Geysers and Imperial Valley in California and in northwestern Nevada. About 20 were analyzed for anions, cations, moisture content, priority pollutants, and trace metals in leachate. Samples from The Geysers and Nevada were not classified as hazardous, according to RCRA regulations of May 19,

1980 (*Federal Register*). However, some samples from Imperial Valley were hazardous with respect to pH, "extract procedure" toxicity, radioactivity, and bioaccumulation—perhaps associated with the high salinity of geothermal fluids from that part of California.

TECHNOLOGY

Computer modeling can help to protect groundwater, says Donald Reddell of the Texas Agricultural Experiment Station and Texas A&M University. One important model simulates the movement of pollutants underground and is known as the saturated-unsaturated dispersion simulator (SUDS). SUDS can include the movement of air as well as water in analyzing the infiltration process. It can also describe the movement of a pollutant in groundwater and determine potential impacts on an aquifer by different types of pollutants. Among possible uses for SUDS are predictions of effects of saltwater intrusion, underground injection, and infiltration of surface pollutants.

One way to recover valuable unsaturated hydrocarbons from biomass could be through ablative (very rapid) oxygen-deficient pyrolysis, according to the Solar Energy Research Institute (SERI, Golden, Colo.). Normal slow pyrolysis produces about equal amounts of tarry liquids and char. Rapid pyrolysis seems to make almost entirely gaseous products, with "significant" amounts of ethylene, propylene,

and other unsaturated hydrocarbons, SERI says. The mechanism seems to be a heat transfer across a very thin film, from a metal surface at about 1000 °C. Biomass depolymerizes and vaporizes under a very high heat flux. SERI estimates that this method could make 35 gal of high-octane fuel/ton of biomass.

A process to remove some acid-rain-forming substances from smoke and combine them with flue gas in effect moves the acid rain reaction from the atmosphere to a controlled area. So say Richard Martinez and John Herron of the National Bureau of Standards, who patented the process. They combine the smoke and flue gas in a chamber in a way that they believe is similar to that in which acid rain is formed by SO₂ and NO_x in air. The inventors believe that the acids so produced could be safely and easily removed and possibly converted into fertilizers.

INDUSTRY

Federal acid rain legislation should be passed, and it should be based on a nationwide emissions tax to finance controls, says the American Public Power Association (APPA, Washington, D.C.). This legislation should apply to *all* fossil-fueled sources, according to APPA. Among points APPA advocates are applying funds to capital costs of control measures chosen, taxing actual, rather than allowable, emissions, and monitoring adequately. No requirements for new facility

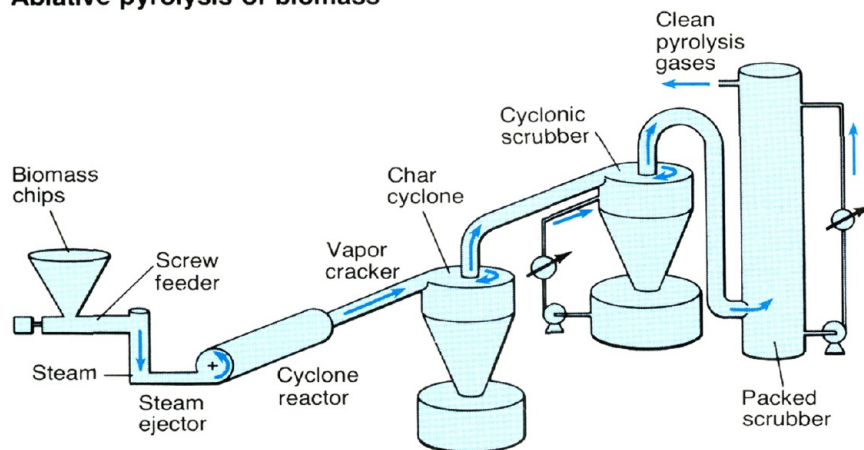
offsets should be included in the emission reduction program, and utilities should have discretion to place their contributions to the emissions tax as a line item on a ratepayer's bill, APPA says.

An alternative funding plan for completing the Clinch River Breeder Reactor (CRBR) was forwarded to Congress by Energy Secretary Don Hodel. The Reagan administration is said to endorse the plan fully. Investment banking firms would arrange for \$675 million to be raised through a bond issue. This sum plus interest would be paid from revenues from electricity generated by the CRBR at market prices for new generating capacity. An additional \$150 million would be raised from private investors.

"There is 'unmistakable evidence' that the Toxic Substances Control Act [TSCA] is working and that the purposes of the law are being met." Jerry Smith, director of toxicology for Rohm & Haas Company made this statement to a Senate subcommittee on behalf of the Chemical Manufacturers Association (Washington, D.C.). Smith cited six years of experience with TSCA. Still, he called for certain changes, such as exemptions from full premanufacture review for low-risk chemicals, more flexible testing guidelines, effective priority setting for testing, and greater selectivity in collecting information. Smith noted that EPA has taken steps to protect the public when health or environmental questions arose and that "extensive testing of existing chemicals is under way."

Three projects concerning polychlorinated biphenyls (PCBs) are being conducted under the aegis of the Electric Power Research Institute (EPRI, Palo Alto, Calif.). The first is to develop alternative scenarios for PCB removal and to outline research directions in this regard. The second is to develop methods for estimating PCB exposure levels in the general public. The third is a "comprehensive" assessment of potential health risks of occupational exposure to PCBs. EPRI also seeks to allay public fears of health consequences of transformer fires and capacitor failures. EPRI will hold a PCB seminar at Atlanta, Ga., Dec. 6-8. For information, contact Narain G. Hingorani, EPRI, P.O. Box 10412, Palo Alto, Calif. 94303.

Ablative pyrolysis of biomass



Source: SERI