

TOXIC METALS

Mostly at safe levels

A report summarizing findings of a U.S. Geological Survey study shows that the heavy metals in water supplies do not usually exceed U.S. Public Health Service standards.

USGS hydrologists, working with the Bureau of Sport Fisheries and Wildlife, analyzed 720 water samples from urban and rural locations for arsenic, cadmium, chromium, cobalt, lead, zinc and mercury. The samples were collected during times of low streamflow when the concentrations would be at their highest.

Only a few of the samples contained amounts of the metals exceeding the USPHS standards and not all of these were taken from sites where water is withdrawn for municipal supplies.

Some of the places and amounts where standards were exceeded: The Mississippi River at East St. Louis, Ill., had 16 parts per billion (ppb) of cadmium; the Arkansas River below Pine Bluff, Ark., had 90 ppb of arsenic; the St. Croix River at Baring, Me., had 890 ppb of lead.

USPHS-recommended maximum concentration for arsenic is 10 ppb; no recommended concentration exists for cadmium and lead, but there is a mandatory maximum for these two metals of 10 and 50 ppb, respectively.

USGS found at least some amounts of most of the metals in many of the samples, and environmentalists warn that the USPHS standards may be unrealistically high in view of possible synergisms.

MASS TRANSIT

Levitation for high-speed trains

Three years ago, Stanford Research Institute scientists prepared a theoretical design for a rocket sled that would be magnetically suspended over a track and be capable of speeds up to 6,000 miles per hour. In an application of this seemingly fairly useless technology to more practical purposes, SRI scientists are now working on adapting the magnetic levitation scheme to trains that might be capable of speeds of 300 miles per hour. SRI has a Department of Transportation grant for the study.

The trains would use superconducting magnets to lift streamlined vehicles as much as a foot off aluminum guide strips as they operate between urban centers.

The major problem is the supercooling necessary for the superconducting magnets. This might be supplied by liquid helium, the scientists say.

LAND USE

Relating economics and ecology

There is fairly general agreement among economists that the free market process described by Adam Smith does not always take into account "externalities," those concomitants of individual economic behavior which impose costs on others. One such cost is environmental pollution.

At a Virginia Polytechnic Institute symposium on land use late in March at the Virginia Polytechnic

Institute, Prof. B. F. Long suggested that the problem does not lie in any necessary conflict between economics and ecology, but rather in a failure to apply truly economic criteria to land-use decisions. A polarization has taken place, he says. Conservationists point to urban sprawl and other misuse of land and attribute the misuse to economic motives; developers accuse conservationists of trying to destroy a free market economy.

The answer to polarization, he says, is to debunk various myths which have become institutionalized and which allow private landowners to continue to impose the costs of by-products on others.

For instance, zoning boards have been largely ineffective, he says, because landowners receive substantial rewards and low penalties for breaking zoning codes. The answer, he suggests, is to measure carefully the real costs of any action, then develop criteria for imposing the costs in a realistic way. Economics and other social sciences can thus join with ecology in effecting major alterations in public institutions. Strong public backing for the changes may be far more important than Government intervention, he believes.

URBAN RESEARCH

Fear is the obstacle

The kinds of urban research most desperately needed are the kinds we are least willing to finance, says Anthony Downs of the Real Estate Research Corp. of Chicago in an article in the March issue of *TECHNOLOGY REVIEW*.

"The reason . . . is simple," says Downs. "Real investigations of how society works would, if they succeeded at all, involve the most essential and profound elements of our lives."

He identified three areas on which research is most needed: outmoded and inflexible institutions; individual and social values, including inquiries into how they are formed and how great a diversity of values society can stand before it falls apart; and persistent economic, political and social inequalities.

SYSTEMS ANALYSIS

Model of Los Angeles smog

Much of the research on smog in Los Angeles has been fragmented and does not show the complex relationships between the various chemical, physical and energy budgets involved.

Eric P. Shettle, a graduate student in meteorology at the University of Wisconsin in Madison, has constructed a computer model of smog that he says is the most complete yet.

Beginning with a complex set of equations called Ed-dington's approximation, Shettle developed his own theoretical analysis, then examined previous information on Los Angeles smog to see whether it conformed to his model. The model was "fairly accurate," says a University of Wisconsin statement.

The model will be useful in deriving unknown data from known data; for instance, if the components of smog are known, then available solar radiation can be calculated, or if solar radiation is known, then smog content can be deduced.