

AIR POLLUTION

Picking emission devices

An economist at the University of California at Berkeley has suggested that decisions on the type of emission-control devices installed by automobile companies should be left to the Federal Government rather than the automobile manufacturers.

Dr. Joe S. Bain says the companies will probably select the catalytic muffler over the exhaust manifold afterburner because the catalytic muffler is generally a better deal for the companies. That such a selection will probably be made is evident in General Motors' decision to reduce compression ratios to allow use of unleaded or low-lead gasoline, he says. Lead in gasoline poisons catalysts in the catalytic mufflers, and the move probably augurs selection of the catalytic muffler.

But the muffler, although having lower initial installation costs than the afterburner, has higher maintenance costs. Also the afterburner would allow use of higher-compression engines than the catalytic muffler and thus would provide a further economy to the consumer, he says.

(Both devices aim at reducing emissions of carbon monoxide and hydrocarbons. Choice of the afterburner and high-compression engines would, of course, cause the lead-emissions problem to remain unabated until substitutes are found for lead to raise octane ratings.)

Dr. Bain suggests that the Federal Government would be more likely than the automobile manufacturers to choose emission-control devices that would assure the optimum combination of environmental protection and economy for the consumer.

WATER POLLUTION

Phosphates not always guilty

Phosphates have been labeled as the culprit—the “limiting nutrient”—in eutrophication of waterways. In this concept, all other necessary nutrients are in adequate supply, and phosphate levels act as the accelerator or decelerator of plant growth. Most scientists agree the indictment is generally valid, but they also agree there are exceptions.

The latest such exception is detailed by Dr. Thomas Bannister of the University of Rochester in Rochester, N.Y. Dr. Bannister says a study he has done of the phytoplankton in the Irondequoit Bay of Lake Ontario indicates that growth of small plants is halted about the middle of July due to a shortage of nitrogen. There would have to be a 10-fold decrease in phosphates before it would become the limiting nutrient, he says.

NUTRITION

Reclaiming protein from cellulose wastes

A high percentage of the solid wastes disgorged by modern societies is cellulose—including newspapers, magazines, corncobs, rice husks and sawdust—and scientists have long sought economical ways to convert the wastes to protein.

Scientists at Louisiana State University have announced that the addition of a second cellulose-metabolizing bacteria to earlier single-bacteria cellulose-to-

food cultures has resulted in a four-fold increase in production of a protein with a nutritionally favorable selection of amino acids.

Dr. Charles E. Dunlap reports that adding a microorganism, *Alcaligenes*, to the earlier cultures of *Cellulomonas* caused the increase in productivity. For each liter of culture medium more than six grams of the protein-high single-cell mass was produced.

The first goal of the researchers is to develop an economical animal feed. Then they hope to further refine the product for human consumption. Present cost estimates indicate the material will be cheaper than fish protein concentrate.

PESTICIDES

DDT degraded by insects

One of the prime ecological liabilities of DDT and other chlorinated hydrocarbon pesticides is that they are not biologically degraded except over long periods.

Entomologist James W. Butcher of Michigan State University reports that a team led by him has demonstrated that two insects—a kind of collembola called a spring-tail and a soil mite—are capable of breaking DDT down into the less toxic compound DDE.

Indications are, says Dr. Butcher, that the insects can be increased by manipulations of the environment such as adding manure to agricultural soil.

In the meantime, scientists at Cornell University have been studying the possible reasons for the resistance of DDT to biological breakdown. Dr. Martin Alexander says that two factors in the DDT molecule—one relating to chlorine substitution and the other to the carbon linking the two benzene rings—are responsible for the peculiar resistance of DDT.

NATURAL SCIENCES

The versatile echnida

The echnida, Australia's spiny anteater, is one peculiarly Australian animal that is in no danger of extinction, reports Mervyn Griffiths, a zoologist with the Commonwealth Scientific and Industrial Research Organization.

The echnida, a spiny, egg-laying mammal with a long, rod-like snout, appears to flourish equally well in the arid outback or in the suburbs of Canberra, says Griffiths, who recently completed a study of the animal's movements.

Movements of the anteater, which Griffiths calls Australia's most successful mammal, appear to be related to food supply. However, echnidas move into Canberra's suburbs during October and November each year, and Griffiths admits he does not know why. But he adds: “It is considerable help to us in planning our work to know that a good supply of echnidas will be available to us at that time.”

Generally speaking, says Griffiths, echnidas travel little, and he has released banded specimens which were found at the point of release 45 days later. But he says they seem to survive equally well in the snowy Australian Alps, in rainforests and arid areas. These are also habitats of the ants and termites that make up their diet.