

environmental sciences

FERTILIZERS

Nitrate pollution reduction sought

Phosphates cause eutrophication of lakes, and have been under attack in Congress and elsewhere (SN: 12/27, p. 592). But nitrates are also nutrients, and they too have been implicated in eutrophication. An example is in Lake Tahoe on the California-Nevada border.

As far as agricultural contributions to eutrophication are concerned, nitrates are a greater problem than phosphates, says soil scientist Dr. Louis T. Kardos of Pennsylvania State University.

Experiments he has performed show that dilution of nitrate fertilizers in the humid East reduces concentrations in the streams to below the 10 parts per million considered safe by the U.S. Public Health Service. But he is concerned that application of greater amounts of nitrate fertilizers will cause serious problems in the East and that these problems already exist in the arid West.

Instead of current one-shot large applications of soluble nitrates, he suggests analysis of soil, rainfall and crops to determine the optimum amounts of fertilizers needed at the right times for any given use.

INDUSTRIAL WASTES

Nondegradable additive

Polychlorinated biphenyls, an increasingly common industrial pollutant, act in much the same way as DDT in causing a decrease in bird life through action on egg shells, says a Cornell University researcher.

And, adds Dr. David B. Peakall, the PCB's show other kinds of parallels with DDT. They are very stable and nondegradable, they are concentrated by passing from the fatty tissues of one organism to another as they move up the food chain, and levels of them are nearly as high as DDT levels in some areas.

The PCB's were discovered in 1929 and are increasingly widely used as plasticizers, flame retardants and insulating fluids.

Dr. Peakall reports that in experiments with doves PCB's cause the same ultimate effect of egg-shell thinning as does DDT. But he has not yet established that the mechanism is the same.

AIR POLLUTION

More on carbon monoxide

There has been considerable confusion over the levels of carbon monoxide in the air that will cause impairment of various human functions, some researchers reporting levels common in traffic situations to be harmful (SN: 1/17, p. 59).

Dr. Richard D. Stewart, Marquette School of Medicine toxicologist, says that 25 tests he performed under extremely careful conditions reveal no impairment to healthy males at levels of from 1 to 100 parts per million of carbon monoxide. The higher level is around the average for heavy traffic situations.

But he emphasizes that he has not yet performed tests on the elderly or subjects with heart ailments, or in connection with possible synergistic effects of car-

bon monoxide with drugs or alcohol.

Dr. Stewart's precautions included elaborate pre-test and post-test physical examinations of subjects and use of the most precise instruments available. The test chamber was designed to be as pleasant as possible so as to minimize psychological effects. All 25 exposures were taped and filmed for later review.

Tests included monitoring of blood carboxyhemoglobin, measurements of motor skills, and electrophysiological measurements in a Faraday cage designed to filter out extraneous electrical impulses.

ORNITHOLOGY

Un-heron-like activities

The Reef Heron of the Pacific has some distinctly un-heron-like characteristics, report Harry and Judy Recher. The Australian husband-and-wife team has studied the birds on Heron Island, a small coral cay in the Capricorn Group at the southern end of the Great Barrier reef.

The obvious difference from other herons is that the Reef Heron is a dimorphic species, occurring in two color phases, pure white and dark slate-blue. The white birds are more common in the tropics and the dark ones in temperate zones.

The color variation had been explained as an adaptation to different conditions for catching fish. But on Heron Island, at least, the two varieties are equally proficient as fish predators, say the Rechers.

And the way the Reef Heron catches fish is unusual, too. Instead of waiting motionless and upright for fish to swim by as do other herons, the Reef Heron goes after fish, stalking them in either a full or partially crouched posture. In another unique adaptation, the Reef Heron has learned to exploit the activities of predator fish that chase shoals of fish close to the water's edge. At high tide, Reef Herons will assemble along the shore following the predator fish and snatching small fish from the shallows.

DETERGENTS

Arsenic in the rivers

Several laundry detergents and similar products contain arsenic, and this toxic metal apparently has entered streams and water systems as a result, says water chemist Dr. Ernest E. Angino of the Kansas Geologic Survey.

Dr. Angino thinks the arsenic is associated with lower grades of phosphoric acid used in preparing the detergents. Some detergents contain only small amounts of arsenic, and the researcher believes these are manufactured by firms using higher grade phosphoric acid.

The highest concentration of arsenic—72 parts per million—was found in an enzyme pre-soak product.

Arsenic levels in the Kansas River and the Lawrence, Kans., sewage system vary from two to ten parts per billion, Dr. Angino says. The U.S. Public Health Service specifies an upper limit of ten parts per billion in drinking water, and Dr. Angino says arsenic levels in Lawrence drinking water were considerably below amounts in the river because of processing.

Arsenic is cumulative in organs, he says.