

BIOLUMINESCENCE

Phosphorescent bay endangered

There are only four bioluminescent bays in the Western Hemisphere, and all but one has either lost its luminescence or is in imminent danger of losing it, says a Johns Hopkins University biology professor who has urged Interior Secretary Walter J. Hickel to take steps to protect the remaining bay.

Dr. H. H. Seliger explains that the bays are inhabited by *Pyrodinium bahamense*, a dinoflagellate alga that emits light when disturbed by fish, boats or other movement. The luminescence can be viewed in the wake of boats. The reason for the loss of luminescence: nutrients dumped into the bays by human activities cause the dinoflagellates to be replaced by nonluminescent algae.

The bay Dr. Seliger wants protected is Phosphorescent Bay near La Parguera, Puerto Rico. Three of the four luminescent or formerly luminescent bays are in Puerto Rico; the fourth, now entirely nonluminescent, is in Jamaica.

All light-emitting organisms, whether marine or terrestrial, emit the light when a substance called luciferin is catalyzed into light-emitting activity by the enzyme luciferase.

Dr. Seliger's letter to Hickel was also signed by Dr. William D. McElroy, director of the National Science Foundation, who collaborated with Dr. Seliger in the bioluminescence work before taking the NSF post.

THERMAL EFFECTS

Heat makes fish vulnerable

Above-normal water temperatures at levels expected from power plant effluents on the Columbia River caused young trout and salmon to become more subject to predation by larger fish, a study by Battelle Memorial Institute has found.

Juvenile rainbow trout and chinook salmon were exposed to lethal temperatures for sublethal periods. Afterwards, the exposed fish were more subject to predation than control fish. The effects were only partially subject to reversal with time.

Temperatures selected were based on the point at which the investigators noticed the fish beginning to lose equilibrium. Thermal doses 10 percent above the median equilibrium-loss-dose in the salmon and 20 percent in the trout caused the increased susceptibility to predation. The median equilibrium-loss-dose for the trout was 15.5 minutes at a temperature of 87 degrees F. and for the salmon 22.5 minutes at 82 degrees F. Both of these temperatures are within ranges expected from thermal-electric plants on the Columbia River. Longer doses are lethal. The study was reported in the *SPORT FISHING INSTITUTE BULLETIN*.

NUTRITION

White bread and vitamins

Novelist Henry Miller once wrote an essay in which he said the soft, bland white bread eaten by Americans symbolized the emptiness of their lives, the lack of both human and dietary nutrition in a mass consumption economy.

It turns out that he was right—about the bread, at least. U.S. Department of Agriculture scientists report that the processing of wheat into white flour removes much of the natural B vitamins and vitamin E. The fate of other important nutrients in wheat processing is now being examined.

There is a loss of the nutrients in both the milling and bleaching processes, but the latter causes the greatest losses, according to the USDA scientists.

In the tests, only about 10 percent of the vitamin E survived both milling and bleaching of soft and hard wheats; 40 percent of the vitamin E in durum wheat survived milling alone, but there were further losses when the durum flour was made into macaroni. Thiamin, riboflavin, niacin and vitamin B₆ were also greatly reduced by milling and bleaching. Vitamin B₆ was the most affected of these B vitamins, with only 15 percent of the original amount left in white bread. Adding vitamin B₆ to enriched flour is being discussed. While not all bread-makers use it, enriched flour contains varying percentages of other B vitamins lost in processing.

BIOLOGICAL CONTROLS

Combined attack effective

A five-year study indicates that four vegetable pests can be controlled by various combinations of bacterial and viral pathogens and a chemical insecticide, reports the U.S. Department of Agriculture.

Cabbage loopers, imported cabbageworms, diamond-back moth larvae and fall armyworms died after combination treatment with *Bacillus thuringiensis* (SN: 9/5, p. 197), a nuclear polyhedrosis virus (named because of its shape and because it attacks cell nuclei in the insects), and chemical insecticides, the combinations varying according to the insect.

Bacteria alone were not highly effective against the cabbage looper, a particularly resistant and damaging insect. Addition of the virus made the attack more effective, as did combining chemical pesticides with the virus.

Control of the fall armyworms, however, was reduced when the virus was added to the bacteria.

TRANSPORTATION

Air transport less polluting

If commuters between suburbs and cities could be transported aboard currently available small aircraft instead of automobiles, air pollution from transportation could be reduced to one-eighth its current level, a U.S. Department of Transportation study shows.

The study was conducted in the urban portions of Connecticut, New Jersey and New York. Travel was between such areas as New Haven, Conn., Newark, N.J., and White Plains, N.Y., and downtown Manhattan.

The 40 tons of pollutants daily released by automobiles in the three-state urban region could be reduced to five tons, say the researchers. They add that another study shows 30 percent of commuting residents would use an air service if it were available.

Vertical take off and landing aircraft appear to be most feasible for commuting, and Rutgers University researchers who did the DOT study claim air traffic problems would be minimal.