

## POLLUTANTS

### Metals affect enzymes in fish

Scientists have discovered various metallic elements in fish and in bodies of water (SN: 3/21, p. 284), usually at sublethal levels. But the effects of low-level chronic doses have been hard to measure.

Three researchers with the Federal Water Quality Administration have measured the effects of sublethal—as well as lethal—amounts of six metals on liver enzyme activity in killifish. They say their technique is useful as a biochemical assay for sublethal poisoning, as well as an indication of the mechanisms of the poisoning.

Dr. Eugene Jackim, Janice M. Hamlin and Stephen Sonis of the FWQA Kingston, R.I., laboratory exposed killifish to various concentrations of beryllium, cadmium, copper, lead, mercury and silver, then assayed the effects on alkaline phosphatase, acid phosphatase, xanthine oxidase and catalase in the livers of the fish. In addition, they did *in vitro* tests of the effects of the metals directly on the enzymes.

Results varied between the two kinds of tests, according to concentrations of the metals, but there were clear-cut inhibitions or increases of enzyme activity caused by all the metals and depending on the metal and the enzyme. The reactions were specific enough in many cases so that they can be used as assays to pinpoint which toxic metal is involved.

## RARE SPECIES

### Umbellula photographed

Scientists have long known of the existence of members of the genus *Umbellula* (the only genus in the family Umbellulidae), a deep-sea, long-stemmed polyp related to sea anemones and coral-forming organisms. But the creatures had never been seen in their natural habitat—down to 16,000 feet depth—and had always died on being brought to the surface.

A Navy scientist, Walter Jahn, photographed one of the animals recently on the sea floor 15,900 feet below the USNS Kane and 350 miles west of the African coast. Jahn, a geologist, sent his photograph to marine biologists who identified it. The photograph was taken remotely from a camera lowered to the ocean bottom.

The genus *Umbellula* includes only seven species and the one photographed has not yet been clearly identified. The creature resembles a flower at the end of a long stem, which is buried in the ocean bottom and anchored with a bulbous growth called a peduncle. The species vary in color and can be yellow, red, orange, pink or purple. Specimens brought to the surface are sometimes luminescent.

## INSECTICIDES

### DDT slows learning of trout

Scientists have grown increasingly concerned over hitherto unsuspected subtle biological effects of various environmental contaminants at sublethal levels. Various water pollutants—at levels allowed by law—were discovered by California researchers, for example, to cause a dissipation of energy in a number of flies and zoo-

plankton and a consequent interference with reproduction (SN: 3/7, p. 248).

Two Canadian researchers have discovered that DDT at sublethal levels interferes with learning in brook trout and thus may interfere with the adaptability of the fish.

Dr. J. M. Anderson and H. B. Prins of the Fisheries Research Board of Canada in St. Andrews, N.B., exposed brook trout to 20 parts per million of DDT for 24 hours, then subjected them to classical conditioning of the propeller-tail reflex. A control group received the same conditioning. The control fish were conditioned in an average of 29 trials each. Ten of the DDT-exposed fish could not be conditioned even after 100 trials, and the other six required an average of 76 trials.

## DUTCH ELM DISEASE

### Vector attracted by chemicals

Dutch elm disease, caused by a fungus, is a serious threat in the United States, having already killed about 40 percent of native elm trees. The European elm bark beetle is the carrier of the fungus.

Dr. Raymond W. Doskotch and Sujit K. Chatterji of the Ohio State University Department of Pharmacy have discovered that two naturally occurring chemicals, in combination, in elm bark attract the beetle, apparently because they make the bark more appetizing. The chemicals, previously unknown, are (+)-catechin-5-beta-D-xylo-pyranoside and lypeyl cerotate.

The researchers extracted substances from elm bark. Then they allowed 100 beetles to feed at will on elderberry pith disks treated with a variety of bark chemicals and other chemicals. Of all the chemicals tested, only the two consistently attracted the beetles.

## EROSION

### Louisiana land loss

Coastlines in many areas are subject to changes due to natural forces or man's activities, or both (SN: 2/28, p. 223).

Dr. Sherwood M. Gagliano of the Louisiana State University Coastal Studies Institute reports that Louisiana's coast is being washed away at the rate of 16.5 square miles a year—as a result of wave action, plus loss of silt due to levees on the Mississippi River and other rivers that prevent replacement of the loss. Another contributing factor is the gradual sinking of the land, at the rate of 0.36 feet a century.

The gradual loss of land threatens to upset the balance of nature by constricting wildlife territory and allowing greater saltwater incursion inland, says Dr. Gagliano.

The levees prevent the silt from being deposited along the shore in fertile delta lands. Instead, it is carried out into the Gulf of Mexico. Dr. Gagliano says the problem is a serious one, the loss in the next 30 years predicted to be 495 square miles, twice the size of Orleans Parish, if it continues.

He suggests the land might be restored again by channeling water from the Mississippi into natural or manmade branch streams that would deposit silt along the coast.