

Natural Sciences Notes

ICHTHYOLOGY

Yellow Bullheads Detect Smells

Yellow bullheads are able to discriminate between the odors of other fish.

In experiments the bullheads were blinded, then taught to associate food with certain fish, electric shock with others.

The blind fish fled the smell of fish bringing the shock, and gulped for food when detecting the odor of fish associated with beef liver, report John H. Todd, Jelle Atema and John E. Bardach of the School of Natural Resources, University of Michigan, in the Nov. 3 SCIENCE.

When deprived of their sense of smell, the yellow bullhead, *Ictalurus natalis*, lost the ability to distinguish between other fish.

Chemical communication may play a more important role in the social behavior of fishes than previously thought, the scientists believe. Certain signal chemicals may help fish to recognize their own broods, to school or to flee when necessary.

ENTOMOLOGY

Honeybee Shortage in California

Honeybees are in short supply, reports the University of California Agricultural Extension Service. There are 40 percent fewer bees that will be wintering in the San Joaquin county this season than last year, and fewer bees in other counties as well.

Almond growers in the California valleys are urged to make contracts for honeybees now, instead of waiting for spring to start renting bee colonies for their orchards.

Fruit growers depend upon commercial beekeepers for the bees to pollinate the flowers in order to produce fruit. With the growing bee shortage, attributed to continual use of pesticides, farmers can expect to pay more to rent colonies—if they are lucky enough to find them.

BIOGEOCHEMISTRY

Plants Betray Minerals Beneath

The yellowing of plant leaves, the color of the blossoms, the size of the plant—all may help pinpoint mineral deposits beneath their roots, scientists at North American Rockwell Corp. report.

Minerals cause certain physical changes in plants, reports Dr. R. J. Thompson, vice president of research at the company's Rocketdyne Division. The study of such changes is called biogeochemistry.

Sophisticated photographic techniques will be able to identify mineral resources from photographs of vegetation by cameras in orbiting satellites or low-flying aircraft, Dr. Thompson predicts.

PLANT SCIENCE

Ferns Repulse Insects

The three-pronged, long-stemmed bracken fern growing tall in forests and fields produces hormones that protect it against insects, agricultural scientists find.

The fern produces two strong hormones that cause the insect to molt: alpha ecdysone and 20-hydroxyecdysone, report scientists at the Insect Physiology Pioneering Research Laboratory in Beltsville, Md.

Certain other plants contain substances similar or related to these hormones, but bracken fern is the first known plant source of both chemicals. Before an insect can cause serious damage to the fern, the substances make the insect molt prematurely or die without maturing, report John N. Kaplanis, William E. Robbins, Malcolm J. Thompson and Barry M. Bryce.

ENTOMOLOGY

Ants Move Tons of Soil

The eastern or Allegheny mound builder, a common species of ant, helps enrich forest areas by carrying tons of soil from below the surface in open forest spaces.

These ants, *Formica exsectoides*, build clusters of large mounds with burrows extending some five and a half feet below the surface, report Sarif Salem and Francis D. Hole of the University of Wisconsin. In three years, one colony of ants moved 15 tons of subsoil. This ploughing increases the nutrients, clay and organic matter of the surface soil, as well as increasing its permeability to air and water.

ORNITHOLOGY

Whooping Numbers for Whoopers

Whooping cranes, once close to extinction, have increased this year to a total of 59, highest in nearly 30 years, reports the Fish and Wildlife Service.

Forty-seven of these majestic birds safely flew the 2,500 miles from their summer nesting grounds in Canada to the Aransas National Wildlife Refuge in Texas, their winter home. More might arrive, Wildlife officials hope. Record low of these birds was 14, counted in 1938.

In addition to the 47 wild birds, there are 12 in captivity, some hatched from eggs taken by U.S. and Canadian biologists from nests in Canada (SN: 6/24) and flown to the United States. Four young whoopers are now at the Endangered Wildlife Research Station near Laurel, Md.

AGRICULTURE

Dry Rice Seed Gives Full Harvest

Rice seeds harvested with little moisture content produce faster growing rice crops, the American Society of Agronomy was told at its annual meeting in Washington.

Rice plants emerge a lot earlier and grow a lot faster when the harvested seed rice contains 20 percent moisture content or less, said Dr. Ervin A. Oelke, agronomist at the University of California.