

# natural sciences

## Ancient clam is a missing link

A "missing link" has been found. For clams, that is.

The fossilized clam, unearthed about 10 miles south of Albany, N.Y., is estimated to be about 570 million years old, some 70 million years older than any previously reported. Known as *Fordilla troyensis*, it "appears to be a missing link between some extinct forms of mollusks and the 20,000 species of clams living in the world today," says John Pojeta Jr. of the U.S. Geological Survey. Pojeta and Bruce Runnegar, formerly of the Smithsonian Institution, report the find in the May 25 SCIENCE.

The species has also been found in Newfoundland and Greenland, but not of such age. "The clam family has proven quite successful," says Pojeta, "and has already survived about 200 times longer than the mere two million or three million years man has been around."

An odd significance of the discovery is that *F. troyensis* had no teeth. "Although some modern clams are able to survive without teeth," Pojeta says, "the descendants of the toothless *Fordilla* probably developed such teeth during the next 70 million years as a means of surviving in an increasingly more competitive and complex world." The apparent evolution and subsequent recession of teeth suggests "that the evolutionary history of clams is even more complex than we once thought."

## Fly factory planned in Mexico

A "fly factory" whose product is living flies—300 million of them every week—is to be built in southern Mexico to help eradicate screwworms, a major livestock pest.

Screwworms are the larvae of the screwworm fly. They feed on living host animals through open wounds or sores. The fly factory will raise millions of screwworm flies, sterilize them with radiation, and release them from low-flying aircraft to mate with native flies, producing eggs that will not hatch.

Originally the factory was to have been built in salvaged naval vessels on the Mexican coast, but costs have moved it to land. As the screwworm is eliminated from Mexico, says the U.S. Department of Agriculture, which is funding most of the project, the 2,000-mile watch that must be kept across the U.S.-Mexican border can be replaced with a 135-mile zone at the Isthmus of Tehuantepec in southern Mexico.

## Water conditions can make pollutants worse

The toxic effects of some water pollutants apparently can be aggravated by variations in the salinity and temperature of the water.

In a study of fiddler crabs, James O'Hara of the Belle W. Baruch Coastal Research Institute of the University of South Carolina found that increases in water temperature or decreases in salinity could greatly reduce the concentration of cadmium required to kill half of the crabs. For a 10-day exposure at a constant temperature of 10 degrees C., for example, the 50 percent lethal concentration dropped from 47 parts per million at 30 percent salinity to only 15.7 ppm at 10 percent salinity. Similarly, at a constant 30 percent salinity, the 47 ppm concentration at 10 degrees C. fell to 17.9 ppm at 20 degrees and only 5.7 ppm at 30 degrees.

"The relationship between cadmium toxicity and temperature and salinity variation," O'Hara reports in the FISHERY BULLETIN, "illustrates that physiological stresses, even within the usual ecological range experienced by the animals, lowers the tolerance of organisms to environmental pollutants."

# environmental sciences

## Coyotes come to Maine

Only one American predator has successfully resisted the most violent efforts to exterminate it, increasing in numbers and extending its range—the coyote. As settlers pushed westward, the coyote moved east until, last November, a 50-pound male was strung up for public view in Millinocket, Maine, the first in memory there.

John Cole, writing in HARPER's magazine, described the mixed reaction. Townspeople gathered around "like primitive villagers . . . they cursed, reviled and spat upon the dead coyote." A bill was quickly introduced into the state legislature, setting a \$50 bounty on the animals hunters said would threaten the annual 40,000 head take of deer.

A familiar confrontation of conservation forces erupted, with environmentalists calling the coyote (probably never a Maine native) "a new and noble predator," and conservative Down Easters calling the environmentalists "anti-people." The state supervisor of Wildlife Services, Frank Gramlich, told a legislative hearing bounties probably would not work. "Didn't they work pretty well on the Indians?" shot back one assemblyman.

Despite what Cole calls "these clumsy lunges to the simpler times of colonialism and extermination," the bill was defeated soundly, 73 to 55. Gramlich later predicted the action could pave the way for restoring a natural balance with "plenty of food for all species," including Maine's long absent native predator, the timber wolf.

## Fire and the savanna

Where tropical rains alternate with annual periods of parching dry heat, an age-old struggle continues between the jungle and the savanna—the sparsely treed grasslands that encroach upon the forest perimeter with the aid of an ancient ally, fire. South of the Sahara, manmade fires are now blamed for the rapid spread of savanna, at the expense of forest, in what has been called "the largest area of mismanaged land in the world."

Recently, the Tropical Group of the British Ecological Society held a meeting, reported in NATURE, to consider the role of fire in the competition between forest and grassland, and what part man should play in its control.

Fire, they found, could be used to the advantage of either jungle or savanna, depending on when it occurred. Early firing, just after the wet season, favors forests. Fire at any other time favors the grasslands. The group discussed the possibility of substituting tropical pines for traditional hardwoods in the fight to make the savanna more productive. Other threats to the jungle are also mounting, they concluded, particularly overgrazing by elephants in East Africa and construction of the new highway in Brazil.

## La Cucaracha

When cockroaches from torn-down houses began to swarm over a Mexican-American area of Pasadena, UCLA entomologist Walter Ebeling got a chance to test his theory that common boric acid can be more effective against the pests than dangerous poisons. Approached by a young Chicano, Michael Zinzun, he suggested spreading the inexpensive powder in the dark, hidden areas roaches frequent. An announcement by the Agricultural Extension Service says the program that followed was highly successful, providing low-income families with a reliable, safe and inexpensive weapon against the disease-carrying insects. Zinzun has set up a community information center and is receiving requests for information from across the country.