ZOOLOGY

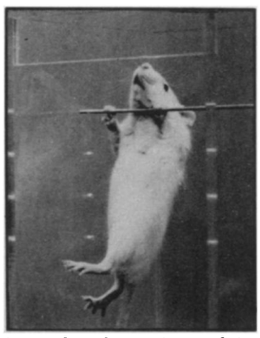
A lacewing in aphid apparel

Aphids, small sluggish insects that suck the juices of plants, have worked out a deal with ants. The aphids excrete a sweet fluid called honeydew and present it as an offering to the ants. The ants, in exchange for this nectar, guard the aphid flock against hungry predators.

Now enter the larva of a nerve-winged insect known as the green lacewing. The larva is greedy for aphids. But how can it get around the aphids' guardian ants? They do it by masquerading as aphids, according to a report in the Feb. 17 SCIENCE by Thomas Eisner of Cornell University and his colleagues.

More specifically, the lacewing larva plucks some of the waxy "wool" from the bodies of the aphids and applies the material to its own back. This disguise generally fools the ants. But if the larva is divested of its costume, the ants promptly seize the larva and throw it out of the aphid colony.

Rats do chin-ups for science



The frisky young rodent pictured here may not be Olympic material, but he's made first string at Battelle Pacific Northwest Laboratories in Richland, Wash. This rat and 1,000 other rodents are participating in a study to see whether exposure to ultrasound in the womb affects physical development after birth.

The study, conducted by Melvin R. Sikov and colleagues at Battelle, is being done because ultrasound is being used more and more on pregnant women to check fetal heartbeats and pulse rate and to locate the placenta. Once the study determines the postnatal impact of various exposure levels of ultrasound, safe exposure ranges for human fetuses can be better established. (Meanwhile the Food and Drug Administration is issuing mandatory safety standards for ultrasound equipment, such as that used to relieve pain and promote healing in muscles and joints.)

Chemical whiffs from fox urine

The red fox, considered the least social of wild canines, is especially dependent on olfactory communication. Olfactory cues among red foxes are believed to assist individual and group recognition, territorial marking, sexual recognition and attraction and even food scavenging (SN: 11/17/77, p. 348).

Urine, the anal sac and the supracaudal (above-the-tail) gland are the sources of the chemicals that red foxes use for smell messages. Now J. W. Jorgenson of Indiana University and his co-workers report in the Feb. 19 SCIENCE that they have identified four volatile chemical compounds in red fox urine.

The chemicals were found in urine of both male and female red foxes during the mating season, suggesting that the chemicals probably play some role in red fox sex recognition and attraction. Synthetic copies of the chemicals can now be used to test this hypothesis and to explore their possible roles in other kinds of red fox olfactory communication.

Deer on a diet

Deer drastically reduce their food intake during the winter, Robert L. Cowan of Pennsylvania State University has found. He thus advises people not to feed deer during the winter except in emergency situations. Otherwise the deer's stomachs will become too full after severe fasting and possibly result in death.

EARTH SCIENCES

Quake prediction: By watching

Earthquake-conscious California seems the logical place to start a quake-watch program, and that's just what the U.S. Geological Survey plans to do in southern and central California within the next year. Peter Ward, chief of the USGS earthquake prediction office in Menlo Park, says the unpaid volunteers will come from groups such as scouts, students and civic organizations, where "there is already existing leadership to take responsibility and group pressure to keep up the activities." The volunteers will collect daily, weekly, monthly and even semiannual data such as well water composition and levels, motion along a fault, ground tilt, variation in electrical current and magnetic field, animal behavior and socio-economic attitudes toward earthquakes. Ward says they hope to design programs that will maintain interest and benefit both the group and the USGS. Combined with monitoring other natural occurrences such as floods, volcano eruptions, tornadoes and landslides, the quake-watch may become part of a college-level or continuing education earth science or geology course. In addition to gathering data, other groups may run "storefronts," train as lecturers on earthquake prediction and preparedness or distribute literature door-to-door. "We want it to be a two-way street," Ward said. "We want to gather data as well as provide information for economic and social decisions."

. . . by seismic slow-downs

Some earthquakes have been preceded by detected decreases in the velocity of vibrations from other nearby quakes; but this event's predictive value has not been established because it has been found inconsistently and only before small quakes. Now, a seismic velocity decrease has been detected prior to the 1975 Kalapana, Hawaii, earthquake that measured 7.2 on the Richter scale. Arch C. Johnston of the Cooperative Institute for Research in Environmental Sciences in Boulder, Colo., found that, beginning in mid-1972, seismic waves from quakes in the Fiji and Tonga islands reached the station nearest the Kalapana epicenter (about 3.5 km away) slower than they had before. The waves, which reached a maximum delay of 0.2 second, returned to normal a few months before the quake. Other stations showed no change. Johnston says the area of the slowdown was relatively small, and proposes that such events may not be detected unless a station has been very near the area of stress build-up a long time. He suggests that increased stress may have opened subterranean cracks around the epicenter which could slow the waves. The cracks may later have filled with water vapor, returnig the velocity to normal.

. . . and by radon

Radon, a radioactive, inert gas with a short half-life, is formed when the trace uranium found in most rocks decays. Radon detection in well water has been found to be a useful predictor of earthquakes (SN: 7/31/76, p. 71), and radon has been detected in large amounts on active faults. To determine whether the radon found along faults may show changes useful for prediction, the U.S. Geological Survey in 1975 began to monitor the gas along the San Andreas and Calaveras faults. According to an article by Chi-Yu King in the Feb. 9 NATURE, there seems to be good correlation between seismic activity and increased radon emanation. Radon emanation increased rapidly several weeks before seismic activity rose prior to a magnitude 4.3 quake on March 17, 1976, and increased simultaneously with seismic activity before a magnitude 4.0 quake on Jan. 19, 1977. King proposes that increasing compression may force to the surface from deeper in the soil gases that contain more radon.