natural sciences

A ball of squid

Squid is something that lots of people have eaten, but few have observed. A recent cruise in the North Atlantic captured some undamaged, live specimens of the squid *Taonis megalops*, and in the June 16 NATURE P. N. Dilly of University College, London, describes their behavior when disturbed.

The undisturbed squid is transparent except for eyes, ink sac and chromatophores (pigmented cells) sparsely distributed over the main part of its body. When something disturbs the squid, the chromatophores dilate. Under a more severe disturbance the squid ejects ink into the water and darts away. Both inking and chromatophore displays have been observed before in cephalopods. But Dilly found that if he really bothered the squid, as by trying to pick it out of the water, it rolled up into a transparent spotted sphere. Further stimuli caused it to release ink within its body, turning it into a black ball. "It is interesting to speculate how many other squid only known from preserved specimens would exhibit similar, or even more bizarre behavior if observed live."

Birds that follow their noses

The albatrosses, shearwaters, petrels and other birds of the order Procellariiformes have highly developed olfactory organs. Some biologists have suggested that these birds, unlike others, have the ability to locate food by smell.

To test this hypothesis, Thomas C. Grubb of the University of Wisconsin soaked identical sponges in cod liver oil and seawater and placed them on poles moored on the ocean. During the daytime, he observed that one species of shearwaters and two species of petrel approached the oil-soaked sponge much more frequently than the water-soaked sponge. Other species of seabird did not respond to either sponge. Nighttime testing showed similar results, at least for petrels.

Grubb concludes that the petrels and shearwaters studied can follow an attractive airborne odor to its source by olfactory cues alone, and that only these birds appear to have this ability.

Rats' ultrasonic sex scream

Many rodents emit ultrasonic cries, often for social communication. Ronald J. Barfield and Lynette A. Geyer of Rutgers University have found that male rats emit ultrasonic cries during the period immediately following coitus.

The postejaculatory "song," they report in the June 23 SCIENCE, consists of pulses of quite pure tones of 22 to 23 kilohertz in frequency. The biologists could not determine whether the sound was emitted from the mouth or nose, but the pulses seemed to correlate with exhalation. At times the intensity of the sound was as high as 80 decibels at five to ten centimeters from the rat's head. Female rats tended to stay away from the singing male and did not hop or dart around as they do when the male is active.

The researchers surmise that the call reflects a state of social withdrawal and may be a desist-contact signal. Rats that have been roughly handled, given electric shocks or defeated by another male emit cries of the same frequency.

earth sciences

Cooler or warmer?

Climate, though less changeable than the weather, is far from stable. Since 1940, a global cooling trend has been noted, especially in higher latitudes. Things are not so simple as they seem, though, according to a report by R. S. Bradley and G. H. Miller of the University of Colorado.

Temperature measurements on Baffin Island, for 1960 to 1969, they report in the June 16 NATURE, show a decrease of 2.1 degrees C. in the mean temperature for the months of June to August. But means for the remaining 9 months show an increase of 2.0 degrees. Airflow measurements showed an increase in cool air from the east and northeast in the summer and an increase in warm southerly air for the winter. Total snowcover increased, and two new glaciers appeared since 1960.

The post-1940 cooling trend, they conclude, is not apparent on Baffin Island, though the landscape seems to be moving toward more glacial conditions. A decrease in mean annual temperature appears not to be a prerequisite for increased glaciation.

Winds in the upper atmosphere

Satellites and rockets sometimes yield important information incidental to their main purposes. D. G. King-Hele of Britain's Royal Aircraft Establishment has been analyzing rocket vapor trails and changes in the inclination of satellite orbits to derive information on wind speeds and directions at high altitudes.

Last year he reported rotation rates of the upper atmosphere at heights of 350 kilometers and 500 kilometers (SN: 10/16/71, p. 264). Now, in the June 23 NATURE, he presents more detailed findings. Winds at 230 to 250 kilometers are strongest from west to east between 9 p.m. and 3 a.m. and weaker, blowing from east to west, in the daytime. He says the pattern at heights around 160 kilometers appears much more complex. Preliminary data suggest an eight-hour oscillation in velocity, but this is very tentative. He also found an anomalous wind of more than 108 kilometers per second in the southern hemisphere near 3 p.m. local time at heights of about 150 kilometers. "The wind seems so strong as to be rather unlikely, but it cannot be spirited away without doing violence to the data."

Trying to match up glaciers

If the glacial advances of the ice ages were caused by worldwide climate changes, dates of glaciations on widely separated continents should coincide.

An Ohio State University polar scientist, J. H. Mercer, found evidence for two glacial advances in south central Chile. Chilean glaciers, he reports in the June 9 SCIENCE, reached a maximum about 19,400 years ago, receded by 50 percent by 16,000 years ago and then readvanced to a smaller maximum sometime after 14,800 years ago. These fluctuations agree with glacial evidence for North America, which shows maxima at between 21,500 and 18,000 years ago and after 15,000 years ago. Data for New Zealand, however, show three glacial advances—18,000, 16,000 and 14,000 years ago.

Mercer says temperature trends for these periods, inferred from oxygen isotope ratios in Antarctic ice cores (SN: 11/7/70, p. 369), seem to agree more with the New Zealand pattern.