

BIOLOGY

Turtle time: By sea or by sun?

What calendar tells a sea turtle that it is time to return to its birthplace to breed? The most widely accepted theory says turtles use water temperature cues. But David Owens of Texas A&M University in College Station claims this would not be precise enough because the thermal environment of inshore marine animals varies too much from year to year due to weather, currents and variable water depth. He suggests instead that the length of the days could give a more reliable signal of the season, as it does for the mating of birds, mammals and fish.

Studies in Owens's laboratory indicate that sunlight-controlled hormone production may operate the sea turtle clock. The turtle pineal gland, which produces the hormone melatonin, is among the largest of any vertebrate. Owens finds a clear day-night pattern in melatonin secretion in loggerhead and green sea turtles. Turning on lights during the night produces a sharp drop in that secretion. "The pineal body could provide the sea turtle with a system to translate the length of day into an endocrine-based biological clock," Owens concludes.

Good bugs versus bad bugs



Univ. of Calif.

A flea-sized wasp is keeping cockroaches in check in buildings of the University of California at Berkeley. Arthur Slater, an environmental health and safety technologist there, noticed that brownbanded cockroaches long established in a building disappeared after a parasitic wasp population was installed. The wasps do not sting people, but they bore into cockroach egg cases and deposit their own eggs (see photo). The wasp larvae feed on the cockroach eggs, and after two months up to 24 adult wasps emerge. Slater releases 20,000 wasps each year to control the brownbanded cockroaches. He suspects, however, that wasps would not control roaches in houses and apartments because only the brownbanded species, not the more common German cockroach, is vulnerable.

The making of a soldier

The defense of the colony in a variety of ant species is entrusted to a special class of worker ants. With large heads and powerful jaws, as well as distinctive behavioral patterns, these soldier ants serve a function quite separate from that of the minor workers who care for the brood, forage and construct nests. The future of a worker ant is determined at the end of its last larval stage: Minor workers become pupae when the larvae are about 1.3 millimeters long, whereas soldier larvae grow 6 more days to a length of 1.8 millimeters before metamorphosis.

Juvenile hormone is the mediator of this occupational assignment, Diana E. Wheeler and H. Frederik Nijhout propose in the July 17 *SCIENCE*. The hormone had been recognized previously to play a role in the embryonic differentiation that leads to queen and worker ants. In experiments at Duke University, Wheeler and Nijhout applied an analog of juvenile hormone to larvae of various sizes and were able to shift the proportion of resultant soldiers from less than 10 percent of the workers to more than 50 percent. The larvae are sensitive to juvenile hormone only when they are between 0.9 and 1.2 millimeters in length. The artificially induced soldiers emerged as perfectly normal adults. Wheeler and Nijhout say, "We are therefore confident that juvenile hormone analog treatment mimics the normal mechanism for soldier determination."

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BEHAVIOR

Refiguring decline in age of menarche

Those who blame the 20th century's rise in teenage pregnancies on a drastic drop in the age of menarche should think again, says Vern L. Bullough in the July 17 *SCIENCE*. "Notions about the magnitude of the change in menarcheal age are based upon misinformation," he says. "There has been some change, but very much less than has been assumed." The sociologist from State University College at Buffalo, N.Y., explains that the common belief that the average age at first menstruation was near 17 years for 19th century girls is based on small Scandinavian samples, cited in a 1962 book by J. M. Tanner. Data from other European countries in the 1800s suggest that age at menarche ranged from 14 to 15 years, much closer to the present U.S. average of 12.5 years, he says.

Between bottle and blue yonder

The commonly required 8-hour drying out period between drinking alcohol and flying an aircraft may not be long enough to avoid dangerous visual disorientation, reported Canadian investigators at a recent meeting in San Antonio of the Aerospace Medical Association. Even as long as 12 hours after drinking, they say, pilots could be flying with alcohol in the semicircular canals of the ear, a condition which can lead to nystagmus (rapid, jerky oscillations of the eyeballs) and related sensations of angular movement during flight.

K. E. Money and colleagues at the Defense and Civil Institute of Environmental Medicine in Downsview, Ontario, first tested the results of rapid ingestion of alcohol (1 milligram per kilogram of body weight) and then checked the effects of prolonged drinking. Five of 12 in the first group experienced nystagmus more than 8 hours after drinking, while four in the second group still showed the condition after 11 hours.

Another report at the meeting indicated that pilots between 40 and 44 years of age are especially vulnerable to having their careers cut short because of problems with alcohol. Shirley J. Dark of the FAA Civil Aeromedical Institute in Oklahoma City analyzed records of 36,484 pilots denied federally required medical certification between 1978 and 1980. By classifying the pilots according to age, Dark found that cardiovascular problems account for most groundings of older pilots, but chronic alcoholism is the leading cause of certification denial among those between 40 and 44 years of age.

APA ethics code tightened

While sexual harassment can be tough to identify and harder to stop, recent changes in the American Psychological Association ethics code may make the sanctioning of offending psychologists easier. A definition and prohibition of sexual harassment (including that of students by professors), guidelines on counselor-client confidentiality and permission to offer personal advice through the media highlight this year's revision of the 1979 code. (The decision to include sexual harassment by professors followed a 1979 APA survey that showed one-fourth of all women who had recently completed doctoral work in psychology had engaged in sexual activities with at least one teacher or supervisor [SN: 9/22/79, p. 201].)

The code directs the 51,000 APA members to differentiate between minor ethical misconduct of their peers, which should be corrected informally, and more serious misconduct, which should be brought before local, state or national ethics committees. About 200 alleged infractions are evaluated by the national committee each year, though the code revisions could increase the number of cases submitted, says David Mills, APA administrative officer for ethics.

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