Biology

Why Florida's cormorants looked drunk

Veterinarians may at last have found the cause of a mysterious and sometimes fatal disorder that turns big birds into fuddled wrecks with an odd stance, a goofy walk, and a tendency to shake their heads.

"People describe them as drunk," says veterinarian Christine Kreuder of Peninsula Equine Veterinarians in Menlo Park, Calif. However, the real problem for double-crested cormorants along Florida's Gulf Coast is probably toxic algae blooms, Kreuder told a joint meeting of the American Associations of Wildlife and Zoo Veterinarians in Omaha, Neb., on Oct. 20.

Afflicted birds have been turning up for some 20 years. The wildlife clinic on Sanibel Island, Fla., where Kreuder used to work, received 388 sick cormorants in 1995 and 1996, but Kreuder failed to find a viral or bacterial cause.

Pathologist Gregory D. Bossart of the University of Miami is developing a test for a toxin produced by algae. When Kreuder sent him tissue samples in 1997, Bossart found that toxin. He also detected it in common murres that got sick in Monterey Bay, Calif., David A. Jessup of the California Department of Fish and Game in Santa Cruz reported at the meeting. Kreuder points out that the findings in the two species provide the first direct evidence for toxic algal effects on wild birds. —*S.M.*

Slugging toads have a mean left jab

A South American cane toad is more likely to punch a rival in the eye if the offender hops to the left side of the toad's field of vision instead of the right, say researchers. The toad's punch, of course, consists of a zap of the tongue.

This feistiness is the first evidence of lopsidedness in processing of visual stimuli for an amphibian, according to Andrew Robins and Lesley J. Rogers of University of New England in Armidale, Australia. With Giorgio Vallortigara of the University of Udine in Italy and his colleagues, they report their findings in the October Animal Behavior.

Rogers adds that prey get zapped more often when on the toad's right. Toads may miss some food and foes that happen to be on the wrong side, but long-term benefits seem to outweigh these losses, she argues. "By having a brain that doesn't duplicate one side's processing on the other, you may get a better brain."

Other animal groups show visual lateralization, she notes. In her earlier work, testosterone-dosed chicks attacked or started copulating behaviors with what they saw with the left eye but not with the right. Also, other researchers find that adult *Anolis* lizards bite more often when approached from the left. —*S.M.*

Use-it-and-lose-it genitals for birds

Among songbirds, the males of an unusually well-endowed species don't waste energy lugging around something not likely to be used.

Young males of the bearded tit grow hardly any so-called cloacal protuberance when isolated from females, report Andreas Sax and Herbert Hoi of the Konrad Lorenz Institute for Comparative Ethology in Vienna in the October Auk. When researchers added females, however, the protuberance began to develop. A male's organ size peaked when his mate produced the first egg and then shrank until it was time to start on the next nest. Bearded tits can lay three clutches a season.

In the same issue of Auk, James V. Briskie of the University of Canterbury in Christchurch, New Zealand, observes that reproductive anatomy is finally catching up with other avian research. The field's lag may have originated from Victorian sensibilities, says Briskie. "Perhaps 100 years from now, our century will be judged as overly obsessed by sex, but then, we, too, are the product of our time." —*S.M.*

Earth Science

From Toronto, Canada, at the annual meeting of the Geological Society of America.

Squeezing oil from ancient rocks

When oil companies probe the globe for new hydrocarbon fields, they don't bother looking at Earth's early rocks, which are thought to be too aged and well cooked to hold any petroleum. Australian geologists, however, have doused the conventional wisdom by finding tiny drops of oil trapped in 3-billion-year-old rocks, nearly twice the age of the oldest known oil.

The geologists examined microscopic bubbles, called fluid inclusions, in rocks from Canada, Australia, and South Africa. When they placed the rocks under ultraviolet light, the liquid in the inclusions glowed in a manner characteristic of oil. Analysis of the light's wavelength indicates that the liquid contains the same hydrocarbons present in oil.

According to theory, oil forms within sediments chock full of plant and bacterial remains. As more sediments pile up, the biological debris gets gently heated, a process that cracks the long organic molecules into petroleum. Add too much heat, say the textbooks, and the oil will break down.

The rocks in the Australian study had long ago reached temperatures of 200°C to 300°C, enough to degrade the oil, in theory. "But it seems that fluid inclusions acted as a protected microenvironment that allowed the oil to survive," says Roger Buick of the University of Sydney. He and his colleagues reported their discovery at the Toronto meeting and in the Oct. 29 Nature.

They hypothesize that the oil survived because, soon after forming, it worked its way into cracked sand grains. As pressure on the grains increased over time, the cracks healed, sealing in the oil and shielding it from chemicals that could degrade it.

The discovery of oil in inclusions one-fifth the diameter of a human hair won't stave off the coming oil crisis. "It's a very small quantity. We have something like a nanobarrel," says Buick. Nonetheless, he suggests that some oil may reside in deep formations that oil companies usually bypass because of their heat.

More important scientifically, researchers hope to mine the inclusions for biological information. Buick and his colleagues are trying to determine whether the preserved oil retains remnants of bacterial cell walls and other markers that could reveal what organisms populated the early planet. —*R.M.*

Hairy clues to the Iceman's diet

The neolithic man discovered in an Italian glacier in 1991 carried a bow and a quiver of arrows, leading archaeologists to label him a hunter. Chemical analysis of his hair now indicates that the Iceman was a strict vegetarian, at least just before his death.

"Hair is a really powerful tool as a record for human diet, and it is apparently intensely well-preserved," says Stephen Macko of the University of Virginia in Charlottesville. "The hair that's 5,000 years old [on the Iceman] was identical to the hair on my own head," showing no chemical deterioration, he says.

Macko measured the ratios of forms of carbon and nitrogen atoms preserved within the Iceman's hair. Both carbon and nitrogen come in light and heavy forms, or isotopes. Plants contain relatively little of the heavy isotopes, so the hair of herbivores has lighter isotopic ratios than does the hair of carnivores.

Researchers have previously studied ancient diets by analyzing the isotopic ratios in the bones and teeth of mammoths and other extinct species. This technique, however, requires large samples, and the molecules can degrade quickly, says Macko. With only a few millimeters of the Iceman's coarse hair, however, he found very low isotopic ratios, indicating no meat consumption as these strands were growing.

Macko has also studied other ancient hair samples. The isotopic ratios found in eight Egyptian mummies suggest that they had a relatively restricted carnivorous diet, whereas Egyptian Coptics had a much more varied one. "They [Coptics] had a huge variation in foodstuffs, equivalent to the modern grocery-store population," he says. —*R.M.*