Birds go buggy by sharing success

Contrary to the teaching of recent textbooks on animal behavior, humans and social insects aren't the only creatures that establish information centers – permanent places to which individuals return to exchange information about the location of food.

Charles Brown, a Yale University biologist, reports that cliff swallows living in colonies of two to 3,000 nests watch each other for behavior indicating the availability of food.

Brown and a team of field assistants studied colonies of cliff swallows on the plains of Nebraska for five consecutive summers. They noticed that swallows returning from a successful search for food arrived at their gourd-shaped mud nests with beaks and throats bulging with bugs, rocked back and forth at the opening of the nest while feeding their young and then flew away to get more food. Unsuccessful bug-hunters simply clung to the nest opening, but almost always followed a successful forager away from the colony. Birds returning to the nest empty-mouthed were unlikely to be followed by other swallows on subsequent trips.

These behaviors, says Brown, indicate that a swallow's neighbors perceive a bug-filled beak, rocking motions and rapid flight away from the nest as cues transmitting the message "food available."

Like humans, the swallows also tended to pay more attention to their mates' and neighbors' feeding activity, usually following successful foragers whose nests hung fewer than 10 nests away from their own. "It's easier to see if the bird next door to you has food than one 30 nests away," explains Brown.

Furthermore, Brown's observations indicate that all birds benefit equally from the information exchange made possible by nesting in colonies: Each bird was equally likely to follow, be followed or forage alone. Each bird was likely to have followers about 40 percent of the time. No bird tried to discourage followers or disguise its mission – perhaps, Brown suggests, because of a plentiful supply of bugs.

Brown, reporting in the Oct. 3 SCIENCE, says his research marks the first clear observation of a nonhuman vertebrate information center. An information center differs from what animal behaviorists call "local enhancement," in which an animal directly observes another animal feeding and stops by to partake. Gulls, for example, converge on a school of fish when they see another gull take a dive. Sharing information about foraging sites is useless to animals that can see where their next meal is coming from.

However, says Brown, "animals that utilize a very unpredictable source [of food] would be the ones you'd expect to develop an information center." Such is the case of the cliff swallows, which feed on crowds of insects gathered in diverse locations by wind currents lasting only 20 to 30 minutes. Like honeybees in a hive, cliff swallows in a nesting colony efficiently locate and exploit these short-lived feasts by observing a gluttonous neighbor and interpreting that bird's behavior to make predictions about food they cannot see.

This finding, Brown says, suggests that information centers can evolve without sophisticated communication techniques such as dance patterns, vocalization or scent, so long as a species relies on food sources of unpredictable endurance and location. – *T. Kleist*

Mary Bomberger Brown

Sparrow-like cliff swallows use their summertime nesting colonies as centers for sharing information about where to find food. The birds – one of which is shown below feeding its nestlings – are the first nonhuman vertebrates found to do so. Evidence for such centers among nonhuman primates is "anecdotal or equivocal," says Yale biologist Charles Brown.

Mt. St. Helens adds to its dome

Since mid-September, Mt. St. Helens in southwestern Washington had been advertising its presence. As its grumblings and gas emissions headed for a crescendo, an early-October internal avalanche belched ash over the landscape for as far as 45 miles. By Oct. 16, scientists from the U.S. Geological Survey (USGS) in Vancouver, Wash., and the University of Washington in Seattle issued a volcano advisory warning that they expected "an episode of rapid lava dome growth" within three weeks.

On the 21st, seismic levels were rated as "very high," just one notch below the maximum classification of "extreme." And geologists observed deformations in the lava dome, a sure signal that a lot was going on underneath. A day later, the advisory was updated: The episode of dome growth was expected to occur in three to five days. Finally, on the 23rd, lava broke through the dome, and a 100-by-200-meter front of slow-moving lava was seen on the dome's west side, where it has since stopped and settled. By early this week it was clear the dome-building eruption had ended. The mountain had regained its calm and USGS officials lifted the volcano advisory.

The seismic activity, gaseous emissions and deformation in the lava dome that previewed the eruption, says USGS geologist Patrick Pringle, mostly fit the pattern observed in the 16 or so earlier dome-building eruptions. He says the dome gained 82 feet during this latest eruption, rising to a height of 918 feet. Christine Jonientz-Trisler, a University of Washington seismic analyst, says she agrees for the most part but was surprised by a sudden disappearance of seismic activity on Oct. 7. "It was peculiar that the earthquakes just shut off," she says. During the last few eruptions, it has taken increasing amounts of energy to push the magma, or molten rock, through the dome, according to Pringle and Jonientz-Trisler. Scientists are still uncertain, they say, just why this is the case. – *I. Amato*