

SCIENCE NEWS®

The Weekly Newsmagazine of Science

A Science Service Publication
Volume 137, No. 2, January 13, 1990

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Subscription Department
231 West Center Street, Marion, Ohio 43305

Subscription rate: 1 yr., \$34.50; 2 yrs., \$58.00.
(Foreign postage \$6.00 additional per year.) Change of
address: Four to six weeks' notice is required. Please
state exactly how magazine is to be addressed.
Include zip code. For new subscriptions only call
(1) 800-247-2160. Printed in U.S.A. POSTMASTER:
Send address changes to SCIENCE NEWS, 231 West
Center Street, Marion, OH 43305. Second class
postage paid at Washington, D.C., and additional
mailing offices. Title registered as trademark U.S. and
Canadian Patent Offices. Published every Saturday by
Science Service, Inc., 1719 N St., NW, Washington, DC
20036. (202-785-2255)
ISSN 0036-8423

Letters

Quirky bird

Ornithologist Stuart D. Strahl's description of a quirky bird ("Alimentary, My Dear Hoatzin," SN: 10/21/89, p.269) may partially answer the question: Where have the dinosaurs gone? In this remarkable jungle discovery we seem to have the feathered remnants of those huge, lumbering beasts that ate, digested, nested, clawed, swam and hissed like hoatzins but were, in fact, plain old dinosaurs.

John Heinerman
Director, Anthropological Research Center
Salt Lake City, Utah

Even though the hoatzin's sedentary nature, poor flying ability and wing claws suggest a primitive stage of avian evolution, Strahl believes the bird is actually highly specialized, having adapted its entire lifestyle to a low-energy diet of leaves. The young hoatzin's slow growth rate, long flightless periods and habit of swimming to escape predators most likely evolved because of its diet rather than repre-

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Cover: For some scientists, the Alpine landscape offers insights into biological evolution and may even suggest ways to harness the process. In their analogy, treks up and down the slopes correspond to mutations leading to adaptive or maladaptive traits. By mathematically charting mountainous landscapes whose points signify proteins of varying levels of capability, researchers hope to discern which of a protein's many possible evolutionary paths would lead to a useful improvement, such as speedier binding of target molecules. (Photo: Courtesy Swiss National Tourist Office)



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senting a case of arrested development, Strahl contends.

He and others do note some striking similarities between the hoatzin and Archaeopteryx, the oldest known bird, which lived about 140 million years ago. This creature had three claws on each wing and apparently used them when climbing in trees. Artists, in fancifully depicting Archaeopteryx with the same coloration as the hoatzin and even the same spiky crest, may have biased ornithologists in hinting that the hoatzin is the missing link between birds and reptiles, Strahl suggests. Nonetheless, he says, the hoatzin is no closer relative of Archaeopteryx than any other member of the cuckoo family. — R. Cowen

Signals, symbols and scent

I cannot let your designation of honeybee signaling as "symbolic" communication go unchallenged ("New Dancer in the Hive," SN: 10/28/89, p.282). Denotation is not sufficient criterion to label a signal a symbol. The relationship between the signal's form and what it denotes must be noniconic.

Honeybee signaling, however complex, still exhibits a necessary identity between the activity constituting the signal (body wagging and orientation) and what it denotes (food-source distance and direction). Therefore, it can only be considered an iconic, or nonsymbolic, form of communication.

John Rhoades
Associate Professor of Anthropology
St. John Fisher College
Rochester, N.Y.

Do bees have a language? "New Dancer in the Hive" provides only one more episode in this centuries-old puzzle.

Proponents of Karl von Frisch's dance language hypothesis have largely focused on supportive evidence, with several executing experiments over the past two decades in further attempts to "prove" the hypothesis true. Curiously, each new attempt was claimed as "finally conclusive," and only then did these researchers concede that earlier

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The COMPASS in Your NOSE

and Other ASTONISHING FACTS about HUMANS



Marc McCutcheon

■ All humans have a trace amount of iron in their noses, a rudimentary compass found in the ethmoid bone (between the eyes) to help in directional finding relative to the earth's magnetic field. Many people have the ability to use these magnetic deposits to orient themselves — even when blindfolded and removed from such external clues as sunlight — exactly as a compass does.

■ The muscles of the eye get the greatest day-to-day workout, moving some 100,000 times in any 24-hour period. You would have to walk about 50 miles to give your legs the same degree of exercise.

■ Nostrils switch on and off every three to four hours — one nostril is smelling and breathing while the other closes down and rests.

■ Bone tissue is constantly being destroyed and replaced. About every seven years the body grows the equivalent of an entirely new skeleton.

■ One-fifth of our daily caloric intake is used by the brain.

■ Chocolate contains the same chemical — phenylethylamine — that the brain produces when people fall in love. By stepping up heart rate and the body's energy levels, the chemical causes a happy, slightly dreamy feeling.

— from the publisher

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attempts had been inadequate.

The "robot bee" experiments are only one more subcycle in a much longer one: When recruited to search for food, do bees use odor or do they use "language" in their search? By ignoring the alternative interpretation that odor could dictate their results, Michelson and his co-workers concluded that their "robot bee" did nearly as well as real bees, since 46 percent of the recruits had arrived at the "correct" site out of four during three runs of the experiment.

The researchers failed to recognize that the placement of their stations in the field could be responsible for the results they obtained. The numbers of recruits arriving at each of the four stations did not differ statistically from those predicted by our odor-search model, based not on the notion of "language" but only on geometric arrangement of test stations.

Adrian M. Wenner
Professor of Natural History
University of California
Santa Barbara, Calif.

According to Roger Morse, who has followed the controversy as chairman of Cornell University's entomology department, the theory that honeybees use only odor and not dance to direct hivemates toward new food sources is "a dead horse." While expressing respect for Wenner's important contributions to entomology, including his investigations into the role of sound in bee communication, Morse cites "overwhelming" evidence from decades of research that the bee dance constitutes an important form of communication.

— R. Weiss

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