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U.S.

Peter Marler, Graphic Decoder of Birdsong, Dies at 86

By PAUL VITELLO JULY 27, 2014

The conventional wisdom among animal scientists in the 1950s was that birds were genetically programmed to sing, that monkeys made noise to vent their emotions, and that animal communication, in general, was less like human conversation than like a bodily function.

Then Peter Marler, a British-born animal behaviorist, showed that certain songbirds not only learned their songs, but also learned to sing in a dialect peculiar to the region in which they were born. And that a vervet monkey made one noise to warn its troop of an approaching leopard, another to report the sighting of an eagle, and a third to alert the group to a python on the forest floor.

These and other discoveries by Dr. Marler, who died July 5 in Winters, Calif., at 86, heralded a sea change in the study of animal intelligence. At a time when animal behavior was seen as a set of instinctive, almost robotic responses to environmental stimuli, he was one of the first scientists to embrace the possibility that some animals, like humans, were capable of learning and transmitting their knowledge to other members of their species.

His hypothesis attracted a legion of new researchers in ethology, as animal behavior research is also known, and continues to influence thinking about cognition.

Dr. Marler, who made his most enduring contributions in the field of

birdsong, wrote more than a hundred papers during a long career that began at Cambridge University, where he received his Ph.D. in zoology in 1954 (the second of his two Ph.D.s.), and that took him around the world conducting field research while teaching at a succession of American universities.

Dr. Marler taught at the University of California, Berkeley, from 1957 to 1966; at Rockefeller University in New York from 1966 to 1989; and at the University of California, Davis, where he led animal behavior research, from 1989 to 1994. He was an emeritus professor there at his death.

Two technological breakthroughs were central to his field research — the portable tape recorder and the sonic spectrograph, a device developed in World War II for recording and graphing the signature sounds of enemy ships' propellers.

Using both, Dr. Marler was one of the first ethologists to produce graphic snapshots of birdsong — streaks of ink on paper, like an electrocardiogram, showing the wave-frequency, modulation and pitch of various calls and songs.

From that data, Dr. Marler and his colleagues discovered that some species had repertoires of only a few songs while others had as many as 100. They found they could analyze and differentiate calls within the same species — calls for roosting, seeking food, mating, territory-marking, warning of danger and summoning help, known as mobbing, to ward off an intruder.

Spectrographic mapping made it possible, as well, to identify dialects in birdsong. ("Dialects are so well marked that if you really know your white-crowned sparrows, you'll know where you are in California," he told The Sacramento Bee in 1997.) And that study led to his interest in the process of language-learning in birds and to several seminal discoveries.

Young white-crowned sparrows (and many other species) go through a babbling phase, he found, just like humans — imitating the sounds of their elders. They then go through an experimentation stage, improvising birdsong riffs that they will later discard.

“What made him such a rare scientist was that he combined great scientific knowledge with the curiosity of a naturalist,” said Fernando Nottebohm, a pioneer in the neurobiology of birds’ song-learning and head of the animal behavior laboratory at Rockefeller University.

Among animal behavior scientists, Dr. Marler is best known for his efforts to end what he described as a false dichotomy in the nature-versus-nurture debate. In a seminal 1987 paper, written with James L. Gould, he proposed that the drive to learn new things was an adaptive trait — and that animals and humans both had it in their genes. Once triggered, individuals’ capacity to fulfill those drives depended on nurturing and other environmental factors.

It was a conjecture at the time. Genetic biologists, including Dr. Nottebohm, later proved him largely correct.

Peter Robert Marler was born Feb. 24, 1928, in Slough, a town near London, to Gertrude and Robert Marler, a factory tool maker.

At age 8, he befriended a rook and had been a devoted bird watcher ever since, said his wife, Judith Marler, who confirmed his death. But instead of ornithology, he studied botany at the University of London, earning a Ph.D. in the field in 1952, doubting that his interest in birds would lead to gainful employment.

A postgraduate fellowship at Cambridge under the noted bird ethologist William Thorpe convinced him otherwise, he said. He earned his second Ph.D. in two years.

Dr. Marler, who had a stroke in 2008, was bedridden with pneumonia, Ms. Marler said, when wildfire near their home forced them to evacuate on July 5. He died that day at a local nursing home.

Besides his wife, Dr. Marler is survived by a son, Christopher; two daughters, Catherine and Marianne Marler; a brother, Colin; a sister, Pauline Parsons; and two grandchildren.

On sabbatical in the early 1960s, Dr. Marler went to Uganda in hopes of detecting language-learning patterns in primates, as he had in birds. But he was disappointed: vervets, the long-tailed monkeys he studied for

months on end, did not learn calls from their elders. But they did communicate, he found, with a precision no one had chronicled before.

His spectrographic records showed vervets voicing a consistent series of barks and snorts when a leopard was nearby, sending their fellow primates higher into the trees; and making a precisely articulated, low-pitched series of staccato grunts when threatened by an eagle, signaling others to find cover near the ground.

Tape recordings of the calls played for monkeys (with no predators about) reproduced the same escape strategies. Dr. Marler cited that as proof of monkeys' ability to transmit knowledge to other members of the species in a distinctly unrobotic way — and suggested that such calls were almost certainly ancestors of human speech.

Vervets also used "a high-pitched chutter with staccato hissing" to warn of the approach of a python — the same sound they made, he often pointed out, to warn of the approach of unfamiliar humans.

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