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How Far Will Dolphins Go to Relate to Humans?



By ERIK OLSEN

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OFF THE BAHAMAS — In a remote patch of turquoise sea, Denise L. Herzing splashes into the water with a pod of 15 Atlantic spotted dolphins. For the next 45 minutes, she engages the curious creatures in a game of keep-away, using a piece of Sargassum seaweed like a dog’s chew toy.

Dr. Herzing is no tourist cavorting with marine mammals. As the world’s leading authority on the species, she has been studying the dolphins for 25 years as part of the Wild Dolphin Project, the longest-running underwater study of its kind.

“I’m kind of an old-school naturalist,” she said. “I really believe in immersing yourself in the environment of the animal.”

Immerse herself she has. Based in Jupiter, Fla., she has tracked three generations of dolphins in this area. She knows every animal by name, along with individual personalities and life histories. She has captured much of their lives on video, which she is using to build a growing database.

And next year Dr. Herzing plans to begin a new phase of her research, something she says has been a lifetime goal: real-time two-way communication, in which dolphins take the initiative to interact with humans.

Up to now, dolphins have shown themselves to be adept at responding to human prompts, with food as a reward for performing a task. “It’s rare that we ask dolphins to seek something from us,” Dr. Herzing said.

But if she is right, the dolphins will seek to communicate with humans, and the reward will be social interaction itself, with dolphins and humans perhaps developing a crude vocabulary for objects and actions.

Other scientists are excited by the project. “ ‘Mind-blowing’ doesn’t do justice to the possibilities out there,” said Adam Pack, a cetacean researcher at the University of Hawaii at Hilo and an occasional collaborator with Dr. Herzing. “You’ve got crystal-clear warm water, no land in sight and an interest by this community of dolphins of engaging with humans.”

How far will dolphins go to engage?

“The key is going to be coming up with a system in which the dolphins want to communicate,” said Stan Kuczaj, director of the Marine Mammal Behavior and Cognition Laboratory at the University of Southern Mississippi. “If they don’t care, it won’t work.”

Dr. Kuczaj developed an early two-way communication system while working at a captive lab in Orlando in the late 1980s. The system relied on visual symbols, not sound, and used a large stationary keyboard that proved to be too cumbersome.

But he says that the effort gave him confidence that such a system could work and that Dr. Herzing is “definitely the closest to getting there.”

“If it works,” he said, “it’ll be a huge step forward.”

Dr. Herzing’s work has been compared to that of Jane Goodall, whose studies of chimpanzees also entailed decades of observational fieldwork.

Born in 1957 in St. Cloud, Minn., Dr. Herzing first encountered dolphins while poring through books as a child, and she realized that the animals would be her life’s work. Her mother died when she was young; her father, a security guard, encouraged her early to explore the natural world.

After graduating from Oregon State, she earned a master’s degree from San Francisco State and a doctorate in behavioral biology and environmental studies from the Union Institute Graduate School, based in Cincinnati.

In 1985, as a researcher with the Oceanic Society, she found this spot in the Bahamas, where the conditions seemed perfect for dolphin observation. That year she started the Wild Dolphin Project, and began using video to document dolphin society.

“In the early days, it was hard to get the animals comfortable with us,” she said. “I often worked in the water by myself. As my eye developed, I was able to say, ‘O.K., here’s a good sequence.’ And I became able to shoot and keep an eye on what else is going on around.”

The project is largely financed by foundations, including the Annenberg Foundation. In 2008, Dr. Herzing was awarded a Guggenheim fellowship.

Back on her research vessel, a 62-foot catamaran called the *Stenella* (the Atlantic spotted dolphin is *Stenella frontalis*), Dr. Herzing reviews video from the day and logs moments of foraging, courtship and play into a growing database. With a few keystrokes she (and other researchers) can summon 25 years of video on a specific behavior — say, a mother foraging with a calf, which can lend great insight to how dolphins teach their children to find food.

“It’s incredibly valuable,” said Laela Sayigh, a research specialist in dolphin communication at the Woods Hole Oceanographic Institute.

Dolphins are known to make three types of sounds: whistles, clicks and burst pulses. Whistles are thought to be identification sounds, like names, while clicks are used to navigate and to find prey with echolocation.

Burst pulses, which can sound like quarreling cartoon chipmunks, are a muddy mixture of the two, and Dr. Herzing believes that much information may be encoded in these sounds, as well as in dolphins’ ultra-high frequencies, which humans cannot hear.

The two-way system she will test next year is being developed with artificial intelligence scientists at Georgia Tech. It consists of a wearable underwater computer that can make dolphin sounds, but also record and differentiate them in real time. It must also distinguish which dolphin is making the sound, a common challenge since dolphins rarely open their mouths.

In the new system, two human divers interact in front of dolphins: First they play a synthesized whistle sound, then one hands the other a scarf or a piece of seaweed. The idea is to establish an association between sound and object. Dolphins are excellent mimics, and the hope is that they will imitate the whistle to request an object or initiate play.

“I think if they pick up on it,” Dr. Herzing said, “they’re going to be excited and say, ‘Oh, my gosh, now I have the power to get what I want in real time.’ ”

Still, she is quick to play down expectations, noting that the system is still in development.

“We’re not talking to dolphins,” she said, adding, “We’ll keep it simple and then we can potentially expand it.”

And while other researchers praise her work, they point out that of dolphin-human communication has often fallen short of expectations.

“It depends on what you mean by communicate,” Dr. Kuczaj said. “I can communicate with my dog, too. But do I have conversations with my dog? Well, if I do they’re very one-sided.”