

UCSC
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Dolphins and all that jazz

Gentle mammals do seem to 'talk'

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SANTA CRUZ — Talking dolphins. The concept came to popular attention in the late 1960s, with researchers continuing to spread the word into the '70s, as posters of the gentle marine mammals cavorting in an idyllic aquaworld became a necessity for college-dorm and pre-yuppie walls.

Part of the thinking seemed to be, in those down-with-the-establishment days, that something higher was in order than mere humankind.

"I think I've seen most everything, when I've seen an elephant fly." Can dolphins really talk?

The answer in 1986, as research continues, is that, yes, dolphins seem to understand language and seem to possess at least a precursor of language — using two different modes of perception to recognize an object.

And that's not all, according to Ken Norris, director of UC Santa Cruz' cetacean research program, dolphins have fretted out another abstract art as well. Call it animal jazz. Norris does.

Standing above the gleaming three-outdoor-tank complex at UCSC's Long Marine Laboratory, Norris bid good morning to Josephine and Gwendolyn, "these two ladies" as Norris calls them, two bottlenose dolphins who are the first residents of the new tanks.

Norris, who has spent the last 14 years working to build the marine mammal center at Long Marine Lab, explained that dolphins can take human symbols — hand signals for instance — use them like syntax, combine them into something like sentences, into nouns and verbs, even pronouns.

All of which leads Norris to pose two questions: Where have the dolphins used this before?

And,

Why should they even know how to structure communication?



Dan Coyro/Sentinel

SANTA CRUZ — Can dolphins communicate? The answer in 1986 is that they seem to understand language and possess at least a precursor of language — using two modes of perception to recognize an object. Trainer

Kathy Krieger is among those at UCSC's Long Marine Lab who are studying dolphins' ability to communicate and find objects using sound. For story, see today's Health/Science section, Page B5.

REFERENCE

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AND, dol-fans, that is not all that jazz either — Norris said dolphins can rhythmically pattern the sounds they make.

We're talking about intra-dolphin communication now, not dolphin-human.

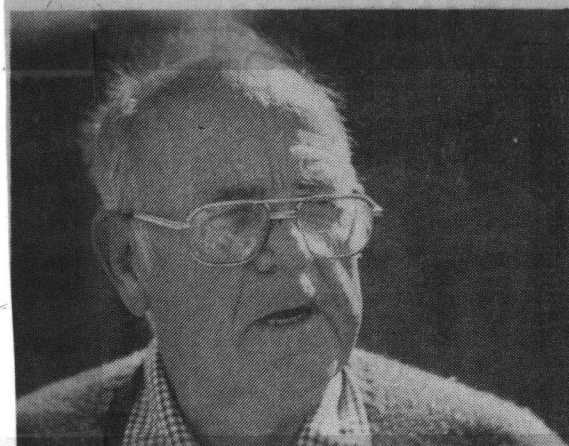
An example: Dolphins might put out a sound that means "courtship" to other dolphins. Then, by one of several methods dolphins have of varying the rhythm of their sounds, the signal might change slightly and the dolphins would understand it to mean they should ignore the courtship signal.

"Think about jazz music," said Norris. "Some musicians lose the beat, noodle around and jam around with one another ..."

And dolphins swim around each other, tails beating, heads moving. The dolphin sound comes out in a narrow, nine-degree-wide "flashlight beam," said Norris. When the beam returns to the dolphins, it comes back rhythmically, because they are swimming.

Norris returned to those puzzling questions, again: "How could they respond to a complex situation like language unless they had some need for it in their lives?"

This response is something beyond, far beyond, domesticated house pets, for as Norris noted, "Did you ever try to teach a cat a sentence?" Dolphins can mimic not only human speech — with poor frequency but excellent timing — but other dolphins as well.



UCSC's Dr. Ken Norris

BEYOND syntax and understanding of sentence complications, dolphins use "echolocation" to bounce sounds off objects. In 1983, Norris and a colleague hypothesized that dolphins use the peculiar-sounding "clicks" of echolocation for something further — "debilitating their lunch," Norris said. Catching fish.

We left the dolphin tanks for a moment and walked back to the bioacoustic lab where scientist Ken Marten played a tape of a killer whale approaching a school of fish.

The tape was recorded by a Swedish biologist. On it, a series of clicking sounds made by the killer whale increases in intensity to an almost maddening frequency until it ends with an explosive sound something like a rifle shot.

The entire process might give dolphins the extra edge they need to capture prey, Norris said.

Back outside, a researcher fed fish to Josephine and Gwendolyn, all the while attaching and removing a suction cup on the dolphins' heads. Eventually, explained Norris, the suction cup will cover the dolphins' eyes, letting the scientists experiment with whether a blindfolded animal can find an object acoustically.

If dolphins can indeed use both sight and sound to perceive, categorize and identify the world outside, they may have one of several precursors of language, since language also requires abstracting from an object to an idea.

Norris came up with another concept about dolphins as well — that they can hear through their throat and jaws. Current experiments are being done to test this theory, using an acoustic prism over dolphins' jaws.

Josephine and Gwendolyn are being trained to point their snouts in the direction of a sound. The prisms, placed over the dolphins' jaws, will distort that sound. If the dolphins respond to the mis-

directed sound, this would indicate they do indeed hear through their jaws and throat.

NORRIS plans to import local dolphins into the tanks, to set up a society of Pacific white-sided dolphins, the species that is concentrated in Monterey Bay. Norris has the use of what he calls his "third generation seasick machine," a research vessel outfitted with what looks like a diving chamber, through which Long scientists can view marine mammal societies in the wild.

The wild blue ocean. Norris seemed to get excited as he talked about some of the greater implications of dolphin behavior. "The animals are remarkable when you think about it," he said, describing how dolphins evolved some 50 million years ago from an order relating to modern deer and ungulates. "Now they've evolved into a high order. But why in the ocean?"

Josephine answered his question. Norris pointed to the shark scars running down the dolphin's head, and said dolphins developed by cooperative learning, in a complex ocean filled with sharks and other scary things.

Cooperative learning, done in social schools of the mammals. Social scientist Gregory Bateson once said that larger brains come about in creatures involved in the complex business of relationships.

Dolphins have both — relationships and a large brain that is only slightly smaller proportionally than humans'. Dolphins, said Norris, can hear sounds 10 times as high-pitched as humans and more than 10 times as quickly — remember the fish-wiching clicks?

While the dolphins' cortex might be simpler than humans', their brains are quite convoluted, and these convolutions, said Norris, are probably devoted to sound and time analysis.

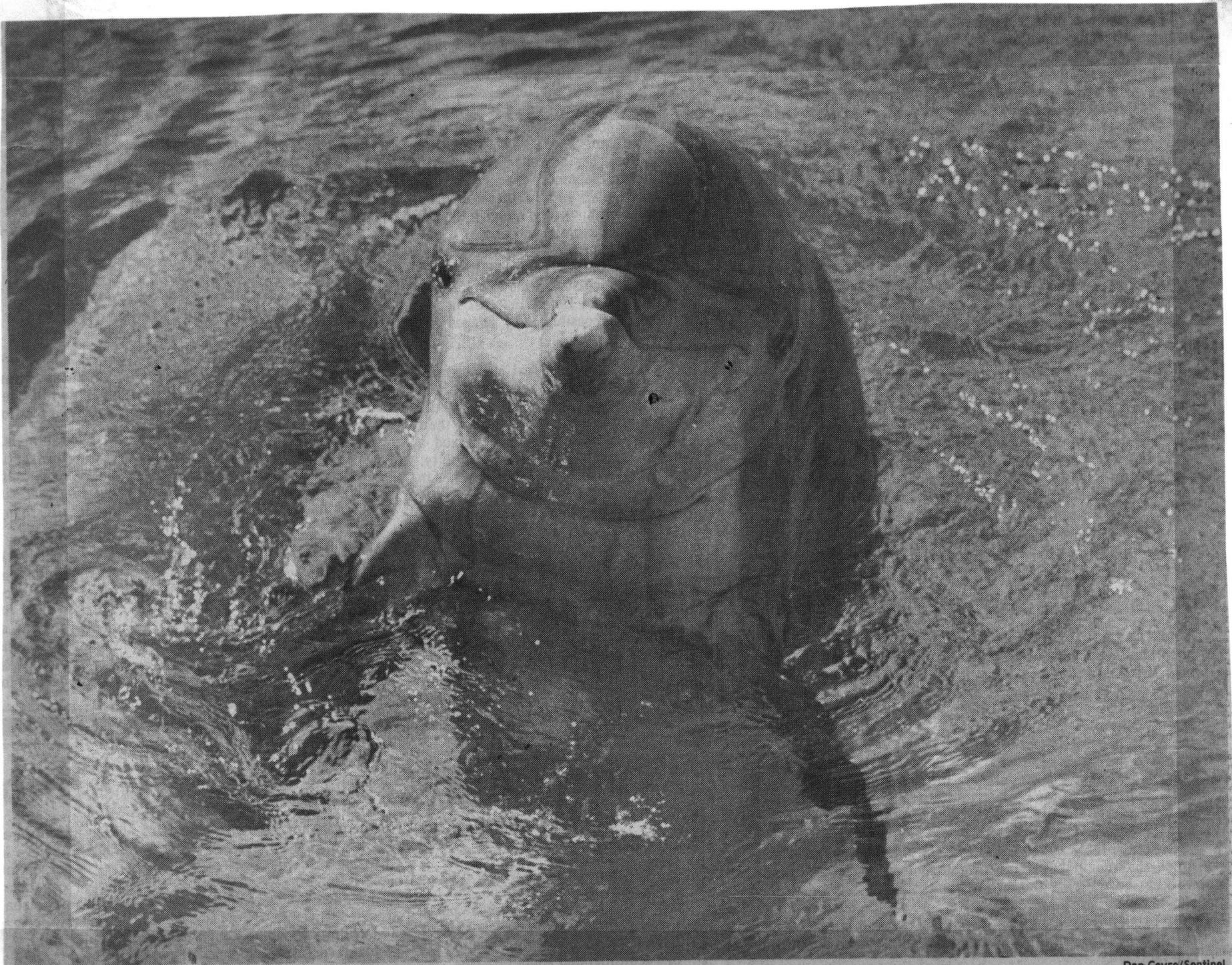
So does he expect dolphins to demand representation in the United Nations? Bring an end to poverty, racism and violence? Open a school for advanced studies?

"I don't expect them to be people," Norris said, with a slight smile.

But ...

He described "wild dolphin societies at sea" where dolphins take care of other animals in distress, where "the school, the society is everything ..."

What if ... what if... Norris cannot help but reveal his bias. "It is fascinating," he said, as the dolphins came nuzzling to the side of the tank, "to learn what a society of large-brained, remarkably non-aggressive animals can be."



Dan Coyro/Sentinel

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