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Who Is the Walrus?

By NATALIE ANGIER

I was about to meet a walrus for the first time in my life, and I felt fabulous. After all, Ronald J. Schusterman of the University of California, Santa Cruz, who has studied them for years, had assured me over the phone that to meet a walrus was to fall in love with walruses — the mammals were that smart, friendly and playful. “They’re pussycats!” he said.

Just as we were entering the walrus house at Six Flags Discovery Kingdom in Vallejo, Calif., however, Dr. Schusterman tossed out a bit of advice. “The first thing the walruses will do when they come over is start pushing at you, pressing their heads right into your stomach,” he said. “Don’t let them get away with that. No matter how hard they push, you have to stand your ground.”

I stopped short, confused.

“If you don’t stand your ground, you’ll be knocked over or backed against a wall in no time,” Dr. Schusterman said.

But but ... I sputtered. How was I supposed to stand my ground against an animal the size of a Honda Civic? This sounded less like “friendly and playful” than “aggressive and possibly dangerous.”

“Just push back on the snout with the palm of your hand and blow in its face,” Dr. Schusterman instructed. “A walrus really likes to be blown in the face.”

But suddenly there I was in the pen, time expanding as I watched Sivuqaq, a 2,200-pound adult male, roll toward me like a gelatinous, mustachioed boulder and head straight for my solar plexus. Somehow, either out of professional pride or rigid terror, I managed to stay standing and stuck out my palm; when Sivuqaq nuzzled against it, all my fears fell away. I stroked his splendid vibrissae, the stiff, sensitive whiskers that a walrus uses to search for bivalves through the seabed’s dark murk, and that feel like slender tubes of bamboo. Then I blew in his face, and he half-closed his eyes, and I huffed and puffed harder and he leaned into my breath, all the while bleating and grunting and snorting for more.

In the public pantheon of marine mammaldom, dolphins are adored, whales revered, and seal

pups make old Bond girls swoon. But walruses remain perversely, lumpishly obscure, known mostly for their sing-song linkage with a carpenter, an eggman and goo goo goo joob. To which Dr. Schusterman and his colleagues might well respond with a blast of a Bronx kazoo. Odobenus rosmarus is a magnificent creature, they say, behaviorally, anatomically, acoustically and taxonomically in a category all its own. The walrus belongs to the pinniped suborder, the group of blubbery, fin-footed carnivores that includes seals and sea lions.

But whereas there are 19 species in the family of so-called true seals, and 14 in the family of fur seals and sea lions, the walrus is the only living representative of the family Odobenidae, those that walk with their teeth. And though the walrus is an Arctic species and thus much harder to study in the wild than the elephant seals and sea lions that flop onto the beaches of Northern California, scientists are gathering evidence that Odobenus is the most cognitively and socially sophisticated of all pinnipeds.

“I’ve worked with marine mammals for a long time, and with many different species of pinniped, but I’ve never experienced anything like walruses,” said Colleen Reichmuth of the Long Marine Laboratory at the University of California, Santa Cruz. “They are fantastic.”

Yet she and her colleagues despair for the walrus’s future. Like the polar bear, which last week was granted protection under the Endangered Species Act, the walrus depends on the seasonal rhythms of the polar ice cap for every phase of its life, which means it is particularly vulnerable to the warming of the earth’s climate and the retreat of the ice.

The walrus might well be a match for any famously eggheaded animal of any nonhuman order: for Flipper, for Willy, for Alex the gray parrot, for Kanzi the bonobo chimpanzee. As researchers have lately determined, the walrus shares with other big-brained species an unusually extended childhood. Walrus calves remain with their mothers for several years, compared with several weeks or months for the young of other pinnipeds, and that sustained dependency “could very well provide an opportunity for learning,” said Dr. Reichmuth, particularly about walrus civics.

Evidence suggests that the bonds between walruses are exceptionally strong: the animals share food, come to one another’s aid when under attack and nurse one another’s young, a particularly noteworthy behavior given the cost in energy of synthesizing a pinniped’s calorically rich, fatty milk.

“Walruses are very gregarious, and they like to be near other walruses,” said Chad Jay, who heads the walrus research program for the United States Geological Survey’s Alaska Science Center in Anchorage. “They like hanging out together, touching each other, socializing. Even when it’s hot and they have plenty of space, they prefer to clamber on top of each other and huddle together.”

Walruses want so much to be with other walruses that if there are no other walruses around, they will make do with the next available large object.

Lee Cooper of the University of Maryland Center for Environmental Science recounted his 2004 expedition aboard a research vessel in the Bering Strait, when the crew came upon a number of calves that had somehow gotten separated from their mothers, and, oh, how excited the calves were to spot the ship and its staff, and how desperately they sought to climb aboard.

“They see this big red and white ship, they must assume it’s a big iceberg and the people moving around on it are something like walruses,” Dr. Cooper said. Unfortunately, the ship was far from shore and lacked the means to serve as a rescue vessel, Dr. Cooper said, and the staff had no choice but to leave the young walruses behind.

Calves might also need time to learn how to play — music, that is. It turns out that Odobenus is an acoustic genius, its body an all-in-one band. Males woo females with lengthy compositions that have been compared in the complexity of their structure and phrasing to the songs of nightingales and humpback whales, but that use a greater number of body parts.

Walruses sing with their fleshy and muscular lips, tongues, muzzles and noses. They sing by striking their flippers against their chests to hit their pharyngeal pouches, balloon-like extensions of the trachea that are unique to Odobenus and that also serve as flotation devices.

In full breeding tilt, the bulls sound like a circus, a construction site, a Road Runner cartoon. They whistle, beep, rasp, strum, bark and knock. They make bell tones, jackhammer drills, train-track clatters and the rubber-band boing! of Wile E. Coyote getting bonked on the head. They mix and match their boings, bells and knocks, they speed up and slow down, they vocalize underwater, in the air, at the bubbly border between. They sing nonstop for days at a time, and their songs can be heard up to 10 miles away. They listen to one another, take tips from one another and change their tune as time and taste require.

Nobody yet knows what a female listens for while she hears one or more suitors singing, but listen she apparently does, for she eventually dives from her icy perch and into the water to mate with a well-tempered male, and evidence suggests she will shun anyone who can’t carry a tune. And though females in the wild do not sing as the males do, they have the anatomical chops to make music and will happily perform the entire walrus Billboard chart if given the right incentive — like the promise of food or affection from Leah Coombs, one of the masterly trainers at Six Flags.

Reporting in the December issue of the journal Animal Cognition, Dr. Schusterman and Dr. Reichmuth described their efforts to explore the extent of the walrus’s vocal talents, its capacity to invent acoustical sequences when given the cue.

Experienced trainers worked with two 12-year-old walruses, Sivuqaq the male and a female named Siku (both names are Inuit), reinforcing the mammals' behaviors by dispensing or withholding food rewards and demanding that the walruses strive ever harder to generate innovative sounds and sound combinations.

The breadth of the walruses' creativity exceeded all expectations, not only during training sessions but also during downtime. Dr. Reichmuth said one walrus figured out how to use a rubber toy in the pool as an instrument by pressing it against a window and blasting air through it until it sounded like a bugle. Soon two other walruses in the pool had learned to do the same thing.

"To use a tool to produce an innovative sound, and to learn about that behavior socially," Dr. Reichmuth said, "now that is impressive."

As impressive as such musical talents may be, and as indispensable as they are to a male walrus's reproductive prospects, the elaborate infrastructure behind them probably evolved for alimentary rather than artistic reasons. Pinnipeds are thought to be descendants of bear-like terrestrial ancestors that, around 30 million years ago, turned amphibious to better exploit marine prey.

Walruses focused on a particular segment of the seafood market: bivalves like oysters and clams and other invertebrates that live in the benthic zone, the muddy floor below the shallow waters of the continental shelf.

They eat huge numbers of bivalves, maybe 7,000 a day. They creep along the seabed, their whiskery vibrissae probing the surface to feel for the telltale tubes of buried mollusks. They dislodge their prey with a scoop of their flippers, or by sucking in water and blasting it back out in targeted jets. They are able to locate, excavate and extract the meat from an oyster in some six seconds, said Nette Levermann of the University of Copenhagen, "and all this without the help of hands and in total darkness."

They have such incredible muscular control over their entire snout area, Dr. Reichmuth said, "that if you drop a little piece of fish on the whiskers away from the mouth, they can walk it along the whiskers, across the muzzle and into the mouth." That precision feeding equipment eventually was recruited to do double duty singing walrus love songs and enabling walrus schmoozes. The walrus's menu plan helps explain its Arctic range and its ice-based life. Benthic feeders fare best where waters are cold, said Jacqueline M. Grebmeier of the marine biogeochemistry and ecology group at the University of Tennessee, Knoxville. In cold waters, organic matter like algae tends to fall straight to the bottom to nourish the clams and worms below, rather than getting grazed off the top as it does in more tropical seas. The more trickle-down bounty for bivalves, the more bivalves for walruses.

Ice sheets above these happy hunting grounds in turn offer the walruses a handy platform on which to rest and rear young. The ice also serves as transportation, for as it retreats and advances with the seasons, the walruses above are conveniently delivered to fresh benthic fields.

A walrus is beautifully suited for life on the rink. Its three-inch-thick hide of blubber and skin keeps it warm, while with its elongated pair of canine teeth, its hallmark tusks, the walrus can heave itself from water and onto slippery ice. Through the machinery of eating, then, Odobenus rises: talking the talk, and walking the walk.