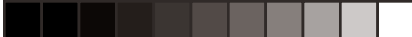


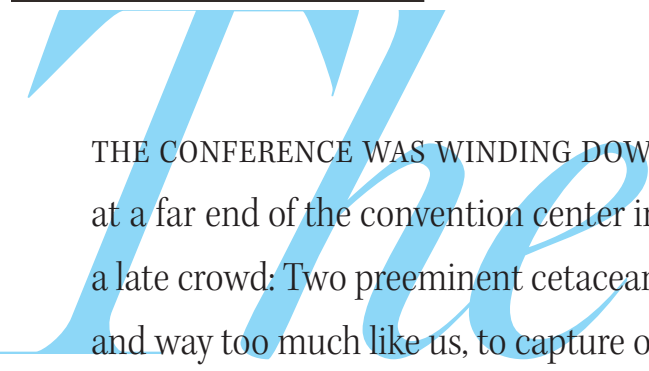


DOLPHIN
DESPERADOES

In the escalating war over dolphin rights,
two pioneers in the study of cetacean
consciousness have sacrificed their
decades-old friendship for their beliefs.

by ERIK VANCE





THE CONFERENCE WAS WINDING DOWN, AND MOST ATTENDEES WERE HEADING HOME. BUT at a far end of the convention center in downtown San Diego last year, one room had drawn a late crowd: Two preeminent cetacean scientists were arguing that dolphins were too smart, and way too much like us, to capture or kill. At the high-profile annual meeting of the American Association for the Advancement of Science, conferring what amounted to personhood on dolphins was a professionally risky act. ¶ Lori Marino, a neuroscientist and cetacean expert at Emory University, kicked things off, her soft features belying her outsize thesis: Pound for pound, dolphins are better endowed with gray matter than most primates, falling just short of humans, and the neocortex of their brain is just as complex as our own. Marino's former mentor and close friend, Diana Reiss, a dolphin researcher at Hunter College in New York City,

spoke next. Kinetic where Marino was calm, her jet-black hair contrasting sharply with Marino's gentle brown, Reiss spoke in more urgent tones. She described her seminal work, conducted with Marino, showing that dolphins could recognize themselves in a mirror, evidence of self-awareness seen until then only in primates and elephants. Treating such creatures as little more than seafood with blowholes was no longer acceptable, in her view. "We face an ethical impasse," Marino said.

Much of the audience arrived already receptive to the message. A shocking documentary called *The Cove*, which would win an Oscar two weeks hence, had already alerted the world to the practice of rounding up dolphins by the thousands and hacking them to death, preventing them from competing with fishermen in the Japanese town of Taiji. At the end of the talks, Reiss dimmed the lights and amped up the mood with an even grittier sequence shot by the German advocacy group Atlantic Blue: Dolphins were dragged behind a big blue tarp in bundles held together at the tail, like bananas. Japanese fishermen shoved three-foot poles through the backs of their heads and then pushed wooden dowels into the wounds. The

dolphins were already dying, but the dowels stanching the telltale blood that would otherwise drench the lagoon.

After the clip ran, one scientist stood and declared in a huff that activism had no place in science. But others lingered for hours, discussing the concept that dolphins were people—not quite like us, but people all the same.

Later that evening, Marino and Reiss met for drinks at a local hotel. For 20 years they had worked together, turning the study of dolphin cognition into a legitimate branch of science. As part of a tight community of serious marine biologists, they had helped rescue their fledgling field from New Age ignominy, fiercely imposing rigor where pseudoscience once reigned and proving that dolphins possess a complex intelligence comparable to our own. But as with some of their predecessors—researchers long since rejected by the broad scientific community—Marino and Reiss risked being branded as extremists or flakes. By 2010 the dolphins, too, had been their friends for decades. As the night wore on, the two scientists returned to the topic of the Japanese drives. The science had led them here, they said, and advocating for the dolphins was their only moral choice.

The meeting in San Diego may have

seemed like the beginning of a new era in the battle for dolphin rights, but for two close friends it marked an end. By the time the year was out, the relationship was fractured, with Reiss insisting that science often required working with captive dolphins, regardless of their intelligence, and Marino calling that viewpoint morally wrong. Marino was so offended by Reiss's stance that she wrote a letter to *The New York Times* calling her a hypocrite. For Reiss and Marino the break has been personal, but for science it forces out into the open a deep professional question: How close can a scientist get to her experimental subjects or her fellow researchers before objectivity itself disappears?

REISS AND MARINO GRUDGINGLY SAY that their story starts with John Lilly, the self-professed father of "dolphinology," an iconoclastic voice of the New Age and a notorious crosser of lines in science himself. Back in the 1950s, Lilly was a National Institute of Mental Health neuroscientist who dabbled in isolation tanks, darkened chambers of lukewarm water in which a test subject—often Lilly himself—could float serenely, completely cut off from the outside world. It was Lilly's isolation experiences that led



to his obsession with bottlenose dolphins, animals he assumed must live in a permanent floating state. Lilly did some of the first work in dolphin intelligence. He insisted that “interspecies communication” was possible and hoped to teach the animals English. To that end, he relentlessly recorded their whistles, clicks, and piercing screams, which he incorrectly compared to rapid human speech. In 1961 Lilly published *Man and Dolphin*, the first of his many popular books holding that dolphins were not just intelligent but nearly human.

To achieve human-dolphin discourse, Lilly believed, *Homo sapiens* and *Tursiops truncatus* had to share their lives. By 1965 he had sealed a house in the Virgin Islands so that the bottom few feet of several rooms and a balcony overlooking the ocean resembled a huge bathtub. Then he pumped in 22 inches of seawater, enough to provide a shared abode for his human assistant, Margaret Howe, and a dolphin named Peter. Howe grew increasingly isolated and depressed while Peter tried to knock her down and mate with her, and the experiment ended after 10 unsanitary weeks.

By 1967 Lilly was giving experimental dolphins LSD, which he took liberally himself. The animals made frightened noises, and several died from mysterious causes. His reputation in the scientific community already strained, he received no public money for research after that.

Despite his questionable experiments, Lilly’s spellbinding lectures and books spawned a generation of dolphin enthusiasts. “These cetacea[ns] with huge brains are more intelligent than any man or woman,” he declared. Once we learned to talk to dolphins, we would discover “ideas, philosophies, ways and means not previously conceived by the minds of men.”

One huge Lilly fan was a young New York set designer and stage performer named Diana Reiss, who read everything he wrote. “His stuff was so way-out,” she says today. “I’m reading this stuff, and I’m thinking,

John Lilly urged Reiss to visit a woman who fed dolphins off her dock in the Florida Keys. That summer she sat in a quiet, reedy cove next to the water, eavesdropping on dolphin communications. A dolphin wasn’t human, but it was a someone, Reiss decided. What was the nature of that mind?

‘Oh my God, he flooded a house?’ From the perspective of someone who knew nothing about dolphins, the whole thing was very cool.”

By 1977 Reiss had enrolled in a Temple University Ph.D. program in bioacoustics and speech science, with an eye toward cetacean studies. Still not working with dolphins, she cold-called scientists for some suggestions. One of them, John Lilly, urged her to visit Betty Brothers, who fed dolphins off her dock in the Florida Keys. That summer, supported by a \$2,000 grant from the National Institutes of Health, Reiss sat in a quiet, reedy cove near the water, setting up recording gear to eavesdrop

on dolphin communications.

Her data were never published, but Reiss developed a conviction that would become the underpinning of her life’s work. It came as the dolphins repeatedly threw bits of seaweed onto the beach for her to throw back. “There is someone in there. It’s not a human, but it is a someone,” she says. “I felt that very strongly in Florida in my first foray into working with dolphins. I felt that someone. Much of my work since then has been informed by that feeling, trying to find out more about that kind of someone. What is that mind like?”

Reiss left Florida with an idea for an invention: an underwater key-



Diana Reiss plays with Presley, one of the first dolphins to show the ability for mirror self-recognition, at the New York Aquarium in Coney Island, Brooklyn.



A pod of spotted dolphins swim in rays of underwater sunlight off the coast of Hawaii.

board that she could use to decode dolphin communication and understand their vocal learning ability by giving them as much control over the experiment as the humans. Hoping to gain insight into how to build such a device, she spent two years at the Laboratory of Physiological Acoustics in France, studying alongside Rene-Guy Busnel, an expert in bioacoustics, especially dolphin whistles and human whistle-based languages.

Reiss returned to Temple in 1980 to finish her Ph.D. and implement her keyboard, but she had neither animals to study nor the money to begin. So she tried cold-calling again, this time reaching Barney

Oliver, founding director of Hewlett-Packard Laboratories and a scientist involved in SETI (the Search for Extraterrestrial Intelligence). If he wanted to communicate with intelligent aliens, Reiss told him, dolphins were the place to start. By the end of the conversation, Oliver agreed to a meeting at HP headquarters in Palo Alto, California. By 1982 he had helped fund a research facility at nearby Marine World in Redwood City, meant to house “reject” dolphins that could not perform in Marine World’s shows. Those rejects—Circe, a female too timid to perform, and Gordo, a fat male with a hormone problem—had been allo-

cated to dolphin petting pools, environments Reiss saw as intrusive and inhumane. She was more than happy to rescue them, pamper them, and provide them with better, less stressful lives while she observed their behavior in larger pools of her own.

A year later, Reiss had a neighbor. Using money partly provided by actor Burgess Meredith (who played Rocky Balboa’s grizzled trainer), John Lilly had acquired a set of smaller pools not far away, where he was still trying to teach dolphins English—an effort that most researchers branded futile. Mostly, camp Reiss and camp Lilly went their separate ways, with Reiss established in a small office and Lilly working out of a van, though occasionally bursting into Reiss’s space. Once, he crept up behind her while she was near a pool and spun her around. “He pressed his thumb to my forehead, like where your third eye is supposed to be, and said, ‘You are going to be the one to break the code,’” Reiss recalls. “He meant it in the nicest possible way.”

Lilly was short on results but had one asset that Reiss would later cherish for years: a dolphin named Terry, labeled aggressive by Lilly but cooperative under Reiss’s gentle care. Terry joined Circe and Gordo, and Reiss set out to win her dolphins’ trust. “I would sit by the side of the pool until they invited me in,” Reiss explains. “Then I would go in and stay at the side.”

Over the next decade, Reiss spent most of her working hours with Terry, Circe, and their calves. They became something more than research subjects—something akin to family. Many years later, when Reiss was on maternity leave, Circe’s calf, Delphi, was sold without Reiss’s consent to a facility in the Florida Keys. There, she was killed by falling debris during a hurricane, and Reiss went into deep mourning. “I don’t think I could have felt any worse if one of my closest family members had died,” she says. “I’m still not over it. You have a long-term relationship that you establish over time. Babies were born in the facility; I watched them grow up.”

BILL CURTIS/INGENIER/NATIONAL GEOGRAPHIC STOCK





Lori Marino questions the value of dolphin-assisted therapy.

Terry's and Circe's calves participated in Reiss's first big experiment: her long-planned underwater keyboard, a panel with several keys that yielded distinct computer-generated whistles and rewards when touched. The rewards were a toy, a fish, or an affectionate rub.

Reiss used the keyboard to understand how dolphin communication worked, following her charges from birth. At first a baby dolphin would hit a key and imitate the noise. A couple of years later, the dolphins were associating the sound with the reward or even using it to call an object by name. Delphi, for instance, would hit the ball key, whistle the ball sound, and start playing with the ball. The dolphins

incorporated the keyboard sounds so thoroughly, in fact, that they even tweaked them to make them more their own. Along with researchers like Louis Herman, a University of Hawaii scientist who found that dolphins can quickly recognize human gestures like pointing, even when a person is on TV, Reiss was shepherding dolphin science into the modern age.

BY 1988 LILLY HAD RELEASED HIS dolphins to the wild to focus on books about spirituality. And Reiss was moving on in an opposite way, trading in her keyboard for more concrete means of exploring the dolphin mind. That is when Reiss got

her own cold call from Lori Marino, a promising student of evolutionary psychology under Gordon Gallup at the University at Albany. Gallup was famous for demonstrating that chimpanzees can recognize themselves in mirrors—unlike, say, a parakeet, which acts as if its image is another bird.

In Gallup's elegant experiments, a chimp was introduced to a mirror until the animal seemed comfortable with it. Then the chimp was anesthetized and its forehead marked with paint. When it woke, Gallup found, it looked in the mirror and touched its own forehead, recognizing the nature of the reflection and thus proving it was self-aware. This behavior quickly became a hallmark of consciousness to animal researchers, partly because it was so testable.

Marino approached Reiss with the idea of trying a similar experiment with dolphins. "Lori was everything you would hope for in a good scientist," Gallup says. "An excellent student. Very bright, highly motivated, very methodologically rigorous." But she also bonded with her subjects and could not bear invasive research. That presented a problem for someone hoping to unravel intelligence by studying the brain.

Gallup's mirror tests gave her a means of understanding intelligence without killing or harming her charges. But mirror-testing a 700-pound sea mammal is not exactly straightforward. You cannot anesthetize an animal that has to be awake to breathe, and an animal without hands cannot touch its forehead. Beyond all that, dolphins do not rely on their eyes alone for sight; they also bounce sonar clicks off their surroundings to see the world, probably explaining why the auditory and visual regions of their brains are so close.

Marino and Reiss grasped the difficulties, but with Terry's and Circe's adolescent calves in tow, they planned the experiment for Marino's summer break, just three months long. First the researchers let the dolphins play in front of the mirror to get used to it. The animals were instantly intrigued and did many of

Public response to the dolphin consciousness study was immediate, intense, and ecstatic.

Reiss and Marino became media stars. They also found themselves drawn increasingly into the world of dolphin activism.

Diana Reiss, off camera, studies mirror self-recognition at the Baltimore National Aquarium, where a young dolphin looks at its reflection.

the things humans and chimps do, like opening their mouths and showing off their genitals. Also, like other self-aware species, they seemed to progress through stages of surprise, wary acceptance, and then self-regard. The next step was marking the animals with dots of zinc oxide when they beached at poolside, much as Gallup had marked his chimps. But when the calves got back into the water, it was clear they did not like the marks. They swam in frenetic circles, signaling anger and panic. “If you look at the videotape, you’ll see this dolphin zooming by, around and around,” Marino recalls.

After halting the mirror study, Marino and Reiss continued on

parallel paths. Reiss moved to New York, teaching at Columbia and Rutgers and setting up a lab at the New York Aquarium, off the boardwalk in Coney Island, Brooklyn. There, she collected recordings as she had in Florida, though with more sophisticated tools. Marino took a teaching job at Emory University, becoming an expert in dolphin and whale brain anatomy along with a technique called encephalization: calculating the ratio of an animal’s brain size to its body size and correlating that with its intelligence. Higher ratios, indicating larger brains relative to body mass, hint at greater cognitive ability as well. The measurement is too rough to tell anything about intelligence within a species but is surprisingly useful when comparing vastly different brains. Humans have the highest encephalization quotient (EQ) on the planet. Among nonhuman primates, chimpanzees have the highest, followed by orangutans and then gorillas and some monkeys. Marino’s work demonstrated that dolphins fall roughly halfway between humans and chimpanzees.

Studying cetacean neuroanatomy played to Marino’s strengths. A network of volunteers collected and dissected the brains of dolphins that had died after washing ashore. That allowed Marino to conduct the kind of research she wanted without being nagged by her conscience. But since dolphin brains must be rushed to the lab within hours for scientific use, specimens are sparse. Marino’s dozen or so dolphin brains constitute one of the largest collec-

tions in the United States.

The two friends spoke often, and in 1998 Marino and Reiss decided to tweak the mirror experiment and try it again. They replaced zinc oxide with child-safe marking pens. Then they set up controls to filter out misleading behavior. For instance, some dolphins would receive real marks while others were swiped with a pen containing water instead of ink, to see whether the dolphins were reacting to the marking process and not the mark itself. And without a three-month limit, the researchers could give the animals as much time as needed to acclimate to a bizarre new game.

The two researchers marked the animals in a variety of places on their bodies, sometimes so obscurely that the dolphins would have to contort to see what had been done. A video camera recorded the whole thing so other lab members could classify each behavior, judging whether the dolphins were self-conscious or not.

This time the experiment worked. The videotapes showed that marked animals immediately went to the mirror to look at themselves. If a mark was hidden, they positioned their bodies to expose it. In a 2001 issue of *Proceedings of the National Academy of Sciences*, Reiss and Marino reported their success, proclaiming that dolphins were the first nonprimates proven to be self-aware.

Lou Herman and some other dolphin scientists quickly embraced the idea. Others, including Gordon Gallup, were doubtful. “I have some serious reservations,” Gallup says. “The evidence for mirror self-recognition in dolphins is tenuous.” Because the work has never been replicated, he feels, “the jury is still out.”

PUBLIC RESPONSE TO THE STUDY had no such nuance; it was immediate, intense, and ecstatic. Reiss and Marino became media stars. They also found themselves increasingly drawn into the world of dolphin activism. For Reiss, who had long worked with groups like Greenpeace and the Earth Island Institute to keep the



tuna industry from using dolphins to round up their catch, it was a comfortable fit. But Marino, whose mentor, Gallup, held that any public activism tainted a scientist's reputation, felt equivocal at best. "In order for us to be taken seriously, we had to stick with the data," Marino says.

Yet once the mirror paper was out there, it became harder to maintain that sense of intellectual detachment. Just a month after it was published, Reiss was approached by filmmaker and activist Hardy Jones at a marine mammal conference. Jones showed her grainy footage of dolphins in Japan being corralled into a small inlet and methodically hacked to pieces. "It's hard not to have images of that in your head," Reiss says. Within a year she was front and center in the protest against the Taiji drives.

After seeing the footage, Marino, too, was overwhelmed. "I called Diana immediately," she says. "It went to the front of my priorities. This was the most important thing for me to do."

In 2005 Marino and Reiss, along with Paul Boyle, director of the New York Aquarium, started Act for Dolphins, tasked with pressuring the Japanese government to end the hunting drives and getting other marine mammal researchers to speak out. The normally reticent scientific community quickly fell in line against the slaughter. Signers of the Act letter to the Japanese government included Lou Herman, Sam Ridgway (a renowned marine mammal veterinarian from the Navy), and over 300 other marine researchers. Reiss pressed her personal network of scientists, journalists, and aquarium managers for support.

Still, it was slow going. The Japanese government responded that dolphin hunting is a traditional practice (indeed, it goes back centuries) and not subject to foreign indignation. Marino and Reiss raised money for a conference at the National Press Club in 2006—but then got little media attention because of a stem cell story that broke the same day.

That same year, a German businessman named Stefan Meister, the owner

of Ocean World, a sprawling casino and amusement park in the coastal town of Puerto Plata in the Dominican Republic, went shopping for dolphins in Taiji, which made a profit by selling off a small percentage of its dolphins to dolphinariums and theme parks. While the deal was waiting for government approval, animal advocates lined up to block the importation of "the Taiji Twelve."

In the end, the Dominican environment minister, Maximiliano Puig, invited Diana Reiss and others to a meeting. Reiss brought the Act letter with Marino's name near the top of the list of signers. After landing in the Dominican Republic, she met with Puig, she reports, "but it was clear he already planned to block the transaction." He did just that soon after she went home, leaving Ocean World with the tab but without dolphins.

A few months later, while driving home from work, Reiss got a call from colleagues of Ric O'Barry, another outspoken activist who had met with Puig. They told her she and Columbia University (where she was then an adjunct) were about to be served with a \$100 million lawsuit for interfering with Meister's business dealings. "I saw a flashing white light, I swear to God. It was the most bizarre sensation," Reiss says. "Immediately I thought, 'They're going to take my apartment, they're going to take my car, they're going to take my kid's education.'"

A year later, Marino got her own notification of a \$100 million lawsuit just for signing the document. To date, Reiss, O'Barry, and Marino, along with Columbia and Emory University, are the only parties to be sued over the deal. Howard Finkelstein, Reiss's brother-in-law, took her case pro bono. He estimates that the suit would have cost her more than \$200,000 in legal fees if he had charged her; as it is, she has paid perhaps \$20,000 for legal paperwork done before Finkelstein came on board. Marino's lawyers, whose fees were covered by Emory, probably amassed similar totals.

For two and a half years, lawyers shuttled to Florida, where the suit was filed, just to get a hearing. The judge refused, giving the plaintiff more time to come up with evidence and leaving the suit in limbo.

THE LAWSUIT MAY HAVE BEEN AIMED at silencing its targets, but it has done just the opposite. Both Marino and Reiss say it has just infuriated them and strengthened their resolve to fight on, yet their lives and beliefs have diverged.

Sitting in the corner of a dark room the size of a walk-in closet at the Baltimore National Aquarium, where her latest experiments take place, Reiss checks her equipment, surrounded by three giant tanks encircling the small space. "One, two, three, testing," she says as she tinkers with a video camera. She focuses on one dolphin, a juvenile. "Is that Foster? That's Foster." Outside, behind thick glass windows, bottlenose dolphins are swimming by. Aqua light from the pool is the only illumination. Reiss commutes to the aquarium from New York City, where she is now a full professor of cognitive psychology and biopsychology at Hunter College. Working across these institutions, she has continued to study mirror recognition along with the developmental and acoustic variables that impact her research and results. Plans for a new, more sophisticated underwater keyboard are under way.

According to Reiss, self-awareness is not a unitary thing but rather "a continuum in which some animals are more proficient and others less. Even when an animal doesn't bump into a table, it is aware of itself. Mirror self-recognition suggests that animals aside from us can understand something external to themselves. It's this idea that we're not alone in realizing self."

Her new plan is to turn out the lights and put a reflective sheet against the window, transforming it into a one-way mirror. The dolphins

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are immediately interested in this new toy and pause to look. A mother and calf named Nani and Beau squeeze in to study themselves. Beau stares intently, opening and closing his mouth. Beau's half-sister Spirit takes a few long looks, making wide, slow circles. Foster is the most enthusiastic. Every time he passes the mirror, he stops, rubs his face against it, and makes quick, jerky motions, looking very much like a boxer jabbing at his own reflection. Then he spins like a corkscrew, keeping his eyes fixed on the mirror and the image he forms.

Today's run was just a preliminary trial. Reiss plans to mark the dolphins and explore subtleties in their mirror self-recognition, such as how early they can do it and whether there is variability within a group. During a short break, she points out that all the dolphins were silent when in front of the mirror. Dolphins are notorious chatterboxes, especially when they meet new dolphins. The silence indicates that they do not confront their reflections as they would a stranger, she notes. Moments later, Foster is back at the mirror, shaking his head and blowing short bubble bursts.

Despite the lingering lawsuit, Reiss also remains active in the campaign against dolphin drives. She meets with rock stars and politicians to talk about strategy. She is even using some of the recordings of the Taiji drives to study dolphin distress whistles. Reiss's advocacy concerns a few of her colleagues, who worry that involvement in activism indicates a loss of scientific objectivity.

But they are more disturbed by Marino, now fighting dolphin captivity on a global scale. Marino has many indisputable points, including her concern over the growing number of "dolphin-assisted therapy" (DAT) centers worldwide. Playing off the public fascination with the dolphin mind, these facilities offer scientifically dubious treatments

using dolphins as healers. In a throwback to the New Age theories of John Lilly, the centers claim that mere contact with dolphins, perhaps through sonar, can somehow treat diseases like cancer and especially autism. Generally, \$2,000 buys four or five pool sessions with a dolphin in a holding tank in the United States.

Marino has attacked the practice with gusto. There is "no compelling evidence that DAT is a legitimate therapy or that it affords any more than fleeting improvements in mood.... Swimming with dolphins is just an elaborate placebo," she recently wrote in the peer-reviewed journal *Anthrozoös*. But in her role as dolphin advocate, Marino has attacked not just the Taiji drives and dolphin-assisted therapy, but those involved in dolphin captivity of any sort. And this sometimes includes her long-time friend Diana Reiss.

"No matter how big an aquarium, you can say 'too small' because you are comparing it with the wild," responds Reiss, who endorsed shuttering the New York Aquarium exhibits while she was there—but not the National Aquarium, where she works now.

TO REISS, THE REAL FIGHT OVER CAPTIVITY hinges on subtleties often misunderstood. Indeed, she herself has come out unequivocally against the act of capturing new dolphins for any reason, including research. And even Marino would agree that releasing dolphins bred in captivity would be signing their death warrant; dolphins need social groups to survive, and captive dolphins are not used to dealing with predators or getting food. "The real question is whether we should *breed* dolphins in captivity," perpetuating the situation, Reiss explains. Reiss apparently thinks so. "Lori and I have differing priorities. I want to use aquariums to get the message out. I want to get as much information as I can about these animals so that we can protect them. The more we understand, the better stewards we can be."

But Marino calls her former collaborator's attitude hypocrisy, a contradiction she can no longer reconcile with the fight for dolphin rights. "You can't have it both ways. You can't claim to speak for the rights of dolphins and then use them at the same time," she says. Marino—a rigorous scientist through and through—has channeled some parts of the

Lilly of long ago. "The day that communication is established, the particular other species becomes a legal, ethical, moral, and social problem," Lilly wrote in 1961. In April 2010, a couple of months after the AAAS meeting in San Diego, Marino criticized what she calls the "captivity industry" before the House Committee on Natural Resources. Even the information put near dolphin tanks in aquariums is often inaccurate, Marino said, geared to put these facilities in the best possible light.

In late September, after *The New York Times* ran an article praising Reiss for her activism, Marino shot off a response. "Many of us who are scientist-advocates for dolphins and whales were surprised to find Dr. Reiss's activities defined as activism," Marino's published letter reads. "The mirror self-recognition study with Dr. Reiss was the last I ever did with captive dolphins. Dr. Reiss, however, continues to work with captive dolphins despite her own findings that they are self-aware."

The two now seem permanently estranged. "It makes me sad," Reiss says over the din of a bustling New York diner near her office. "And I can't talk to her about it. I don't know what to do. I think her science is great, but I think her work would be more powerful if she were just a little more careful about not alienating people."

In a quiet vegetarian café near Emory, Marino strikes a similar chord. "I've known Diana for a thousand years. She gave me my first break working with dolphins, and I'll always be grateful to her for that," she says. "I'm just more disappointed than anything else."

Earlier that day Marino had taken me to see her collection of brains. She continues to study the dolphin cortex, but advocacy takes up most of her time. Given the shift in focus, her biggest science papers may be behind her, but as far as she is concerned, her greatest work still lies ahead. She firmly believes that no dolphin should be born in captivity, fully aware that many of her colleagues consider her position extreme and even unscientific.

Marino is quiet for a while, and I suggest that perhaps advocacy is better kept separate from scientific endeavor. Finally she looks up and simply asks, "If not scientists, then who?"