

Vance Early Draft - Dolphin Desperados

The symposium was expected to be no different from any of the other 50 talks that day. A raft of scientists lined up along a bland meeting room in the San Diego Convention Center on a bright February day to discuss their recent findings. In the sterile audience, students and scientists sat in rows ready to listen and take notes on the proceedings. Since the talk was on dolphin intelligence, there were a few more members of the press than in most rooms, but it was hardly a news event.

Even so, the docket was good. Among the speakers were Diana Reiss and Lori Marino, two of the most well known scientists in the field of dolphin intelligence. Reiss was famous for doing some of the first work with dolphins and underwater keyboards and Marino made a name for herself in the neuroanatomy of cetaceans. But even more than that, they were known throughout the world for their famous mirror experiment, which would undoubtedly be the thrust of this talk.

First Marino got up and talked about the intricacies of dolphins grey matter. Then Reiss got and added to it the history of dolphin behavioral research. It was the usual cast of characters, stretching back over the last three decades of investigation into these clever animals. Then something happened that no one expected. Somewhat unceremoniously, they started a video on the overhead projector. The screen began displaying gruesome images of dolphins being hacked to pieces and dragged, still thrashing in their death throws, onto tiny Japanese skiffs.

The staid audience shifted uncomfortably in its chairs while a couple journalists perked up as if just tuning in. This was the annual meeting of the American Association for the Advancement of Science, not some kind Greenpeace rally, for God's sake. And yet here were these women using phrases like "our duty as scientists" and "moral imperative."

The video stopped and Reiss said, "I think we have time for a few questions." Later, reclined in a nearby hotel bar lounge, Reiss and Marino laughed and reminisced over cocktails about their 25-year friendship and the work that had brought them to this moment. From mirrors to brains to wayward whales in the San Francisco Bay, the pair has been a tour de force in the ever-shrinking niche field of dolphin research. Their work, and especially their seminal article on dolphin mirror recognition, has been swept up not only by generations of scientists but also by a public that can't get enough of everything dolphin. Recently however, that work has taken a turn that seems to have become a natural extension of behavior research. Like Jane Goodall and Dian Fosse before them, Reiss and Marino have wandered from pure research into the murky world of advocacy, pleading for the rights of animals caught between human greed and politics.

Near the end of the evening Reiss leaned back and caught a conspiratorial look from Marino. "And of course you've heard about the lawsuit," she said. "Oh, yes, Lori and I are being sued for 100 million dollars. Did you know that?"

Break

In many ways Marino and Reiss's story traces back to a bizarre researcher

Lori Marino and Diana Reiss first met in the summer of _____ in at a series of pools located in the golden hills of Northern California.

How many times a day do you contemplate the animal mind? When a squirrel runs out in front of your car, darts back and forth twice, and then breaks for cover, do you wonder what it's thinking? When that beloved pet begs for scraps at the table do you momentarily wonder what might be crossing its primitive little mind? When a chimpanzee wanders onto your television screen selling E-Trade investment services or Arby's sandwiches do you wonder what's really motivating him?

Most people don't really care. If they do, perhaps they look down at a beloved pet begging for scraps at the table and wonder momentarily what might be crossing its primitive little mind.

But a few – those who can scrape together the money and can find research subjects – have dedicated their lives to pondering the thoughts of

Comparative psychology, philosophy of mind, ethology – whatever you want to call it – is a labor of passion. Whether they study apes, parrots, or rats in a maze, its purveyors are driven by intense curiosity for curiosity's sake alone. It's a fundamental, almost existential question on par with the search for new planets or exotic subatomic particles.

But unlike these others, studying the animal mind is a mostly solitary pursuit. There is no giant animal behavior facility in Switzerland or a special government agency where geniuses from across the world gather. Its members are mostly passionate lone scientists able to claw together funds and find humble research facilities on the edges of zoos and aquariums or deep in psychology department.

Nowhere is this truer than in dolphin intelligence work. And perhaps no two researchers reflect this passion quite as well as Lori Marino and Diana Reiss.

Reiss and Marino are something like the ying and the yang. Reiss, with her jet black hair and intense pace is matched by Marino with her softer edges and warm demeanor

I am sitting in the corner of a small dark room, perhaps the size of a walk-in closet surrounded on all sides by deep pools of aqua blue water.

"One, two, three, testing," says Diana Reiss, as she tinkers with a video camera.

"We're going to stop talking in a minute."

Reiss and I are squeezed into this tiny room in the middle of the National Aquarium's dolphin stadium. I can't help but wonder who is in the cage, the dolphins or me. There are three tanks in all, surrounding us like pinwheels on a hub. Each houses dolphins that periodically swim by and glance in. Reiss is here to build on a landmark study that she did with her partner Lori Marino in 2001 that entered the animals into a select club of creatures that can recognize their own image. The plan is to turn out the lights and put a reflective sheet against the window, transforming it into a one-way mirror.

When the mirror goes up, the dolphins are immediately interested in the new toy. A mother/calf pair named Nani and Beau squeeze in to study the mirror, Beau regularly opening and closing his mouth. Beau's half sister Spirit takes a few long looks, making wide, slow circles with her rostrum.

A young male named Foster is clearly the most enthusiastic. Every time he passes, he stops for a long while. He rubs his face and makes quick, jerky motions I can't help associating with a boxer jabbing at a mirror. Then he spins like a corkscrew while keeping his eyes fixed on the mirror.

It's a queer sensation staring through a mirror at an animal staring at itself. Yet it's not clear to me that they recognize themselves. Reiss suggests I stop looking and start listening. Nothing. Dolphins are notorious chatterboxes, especially when they meet new dolphins. Yet, when all the dolphins come to the mirror, they are silent. This, she says, suggest that at the very least the dolphin isn't like a parakeet, which will confront its own reflection.

I turn back to Foster, who is now shaking his head and blowing short bubble bursts. He does it again, this time upside down. I first learned of Marino and Reiss in the winter of 1997, working at Marine World in Vallejo, California. I was there to study the behavior and communication of show dolphins that weren't currently performing. Although I never actually met either women, they were legends at the facility.

Both were stars in dolphin behavior. Reiss had set up the theme park's research arm in the early 80's and had been integral in helping "Humphrey," a wayward whale in the San Francisco Delta, find his way back to sea. She had also done the first work using an underwater keyboard with dolphins. Marino was making a name for herself understanding the dolphin gray matter, comparing brains of cetaceans to those of primates and other animals.

They were paragons of science – clear eyed and incisive. So I was shocked years later when the pair got embroiled with an animal rights campaign alongside an Oscar-winning documentary and some of the most outspoken advocates in America. And I was even more shocked when this advocacy landed them in a lawsuit for hundreds of millions of dollars.

Break

Man has long been infatuated with the dolphin. Greek mythology is littered with references to the animals as sacred messengers for the sea god Poseidon or as rescuers of heroes at sea. Fishermen from the Britain to the Amazon have said dolphins bring good luck and killing them brings a curse.

The study of dolphin cognition, however, is relatively young. Until the mid 20th Century the dolphin brain, while big, was considered little more than a bloated cow brain. I consider this as I standing next to a deep pool about the size of a basketball court. The wall of the pool doubles as a window so I can peer eye-to-eye with the cetaceans as they swim. They seem uninterested in me, but like so many visitors, I am almost hypnotized by their rhythmic circling.

"Watch out, sometimes they can splash you down there. They do it to watch your reaction," Reiss calls out from a higher vantage where she is talking to a trainer.

Sure enough, one dolphin soon surfaces 20 feet away and gently slaps the surface with her tail fluke. After a few splashes, she sidled up to the window, gently crests, and on the way down expertly thumps the surface with an explosion of water that nearly douses me. She immediately spins and watches me duck to the right.

“That one is Maya. She’s feisty. She’s the equivalent of a pimply faced teenager right now,” Reiss laughs.

Reiss is small, with jet black hair and a penchant for black, stylish clothing. A blur of activity, she moves fast and talks forcefully with a slight New York accent that she swears doesn’t exist. While she has a passion for animals, she exudes no-nonsense businesswoman. She is instantly charming and cordial but also stubborn to a fault. (It’s worth noting that Reiss has been married three times. To the same guy. Even there she refuses to budge and insists it was technically twice.)

She is also one of the country’s foremost dolphin behavior experts. She has studied and published in communication, language, consciousness, and intelligence. Her career goes back to the 1970’s when she got a break from John Lilly, the man who first brought dolphin intelligence into academic study.

In the 1960’s Lilly was a psychologist at the National Institute of Mental Health interested in how behavior and communication intertwine. It was a heady time for behaviorists. Until then, a thick line had been drawn between sentient humans and the rest of Earth’s mindless rabble. Yet people like Jane Goodall and Dian Fossey were breaking these lines with shocking observations of wild primates while lab studies showed that apes were capable of highly complicated behavior. Slowly, the notion of “thinking” animals was emerging and Lilly decided dolphins deserved similar attention.

“[Lilly] exposed to the world the large brain of the dolphin,” says Marino. “That was the good thing that he did. The bad thing he did was go way beyond the data – he went to la-la land.”

Sadly, Lilly’s most enduring contribution may be what Marino calls the “giggle factor” around dolphins. His ideas were alternatively brilliant and insane. Scientists of his day were obsessed with making animals more humanlike – living with chimpanzees as if humanness was some kind of contagious disease. Lilly tried a similar experiment by flooding the bottom floor of a house and having a human and dolphin live together in domestic bliss (the male dolphin did not become more humanlike, but did attempt some domestic bliss with the female scientist, eventually ending the experiment).

This was just one of Lilly’s catastrophic experiments. Enamored with spiritualism and the US counter-culture movement, he thought dolphins were enlightened beings and led grisly experiments with dolphins and LSD (and also made several ketamine-fueled predictions about the end of the world).

“[Lilly] sort of elevated these dolphins to a status of almost angels that were coming to save us,” says Reiss. “It was almost like a cult.”

This new-age notion of dolphins is still around today, but the next generation of researchers was more serious. The centerpiece of this generation was Lou Herman’s Kewalo Basin Marine

Mammal Laboratory in Hawaii. It was Herman and Reiss's generation that added scientific rigor to Lilly's observations.

"The thesis that I started with was to show whether it's necessary to be a primate to have the kind of intelligence that we honor with the word 'intelligence,'" says Herman. "There is more than one path to intelligence."

Lilly once tried to teach dolphins to imitate English. Herman took that idea, but used tones that sounded dolphin-like and recorded the responses in a way that could be analyzed. He found the animals learned new sounds blisteringly fast and if they couldn't copy it, they harmonized.

The work inspired Reiss, then a young researcher who had recently convinced Hewlett Packard to fund a research center in the pools behind a California marine park. She began playing tones and matching them with rewards, like fish or a belly rub, eventually allowing the dolphins to choose which they wanted with an underwater keyboard.

What people like Reiss and Herman were finding was that dolphins were not humanlike, but they did have an amazing ability to imitate what they saw and heard. For instance, Herman found that dolphins could not only understand what pointing meant, but they could understand it on a television screen. Chimpanzees can do the same, but not nearly as fast as dolphins. He also found that dolphins were quicker at separating things like *take the hoop to the ball* from *take the ball to the hoop*. When they weren't imitating human, dolphins could also improvise new behaviors on command – often in perfect unison.

At the same time Herman was teaching dolphins to point and watch TV, Reiss was setting up her California lab. In 1988 she met Marino, a young researcher from the legendary Gordon Gallup's lab. Gallup was famous for work with chimpanzees and mirrors. Now, this wasn't new – Darwin himself experimented with orangutans and mirrors. But using a clever ploy, he demonstrated that apes actually recognize themselves. Briefly, an unconscious chimp was marked with paint and then put in front of the mirror. When it woke, it looked in the mirror and touched its own forehead, thus proving it was self-aware.

Self-awareness has since become a hallmark of consciousness, due partly to this work and Marino and Reiss wanted to try bottlenose dolphins. But as with so much in dolphin research, execution was harder than conception. First, you can't anaesthetize an animal that has to be awake to breathe. Second, an animal with no hands can't touch its forehead. Last, dolphins rely heavily on echolocation, and who knows how that influences what they see in a flat mirror? In the end, the pair had to admit defeat. While the dolphins certainly reacted to mirrors, it was impossible to define what they were doing. It would be more than a decade before the pair would be able to try again.

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To get to her brain collection, Lori Marino has to walk across the Emory University campus and through a labyrinth of tight corridors to a small windowless room with a fume hood and a few storage boxes. Under the fume hood are perhaps a dozen bulbous brains sit suspended in plastic bins of fluid. Marino takes out one from a common dolphin and holds it.

“You can see the level of convolutions in the neocortex, here,” she says, pointing to a maze of tight wrinkles. “You can see all the wrinkles. What that does is increase the surface area for the neo cortex. We’re talking about a very different brain from humans.”

Marino is in many ways similar to Reiss, but with softer edges. She has long brown hair and deep, soulful eyes. She embraces her New York accent, but takes time as she talks, more like her adopted Georgia neighbors. Gallop says that she was a smart and careful student who did top level science. At the same time, he always sensed that she was deeply emotionally connected to her subjects.

Almost as amazing as this bizarre brain lab is the fact there are so few like it. This humble collection of mostly bottlenose dolphin may be the third largest cetacean brain collection in the country. At least in the top five.

“There are just not enough people studying dolphin brains. Period,” she says.

“We don’t have that many brains available,” says Patrick Hof, a frequent collaborator with

Marino who’s New York brain collection may be the most diverse in the world. “The problem is really access. These are not easy species to work with. If you want them, you have to go get them.”

In addition to a dearth of dolphin brains, there are few people studying them and thus we know shockingly little about them. Marino has spent most of her career just constructing what she calls a “lay of the land” around the dolphin brain, creating the first MRI images of the dolphin brain and making very simple measurements using brain weights.

“The limbic system in mammals is there for memory, processing of emotions, those kinds of things. [The dolphin limbic system] is really crazy elaborate. And then they have this other lobe adjacent to it,” Marino says. “What does that do? We have no idea.”

Traditional brain research requires either a patient you can talk to, a brain you can tinker with, or both. To understand how parts of the brain work, scientists a) find a person with brain lesions and determine what is missing, b) drill electrodes into the brain, or c) use brain scanners.

None of this is possible with a dolphin brain, nor is it easy to presume that the brain is laid out similarly to primates. What we do know can be traced back to the 1960s. Again, Lilly is the starting point but not the best example. Prior to Lilly cetacean brains were presumed to be homogenous blobs. Lilly pioneered methods using electrodes drilled into a living dolphin’s skull to look for electrical activity. He used his electrode to identify several pain centers, among other observations. His conclusion was that dolphin brains are more complicated than previously thought (however, in true Lilly style, he presumed this size correlated to exceptional “gentleness” of the animal).

In 1972 the Marine Mammal Protection Act made drilling holes in dolphin brains taboo and most of the world turned to brains from dead animals. In the 1980’s work by Ilya Glazier and Peter Morgane led to something called the “initial brain” hypothesis, which essentially claimed that a dolphin brain was just a supersized primitive brain – a sort of return to pre-Lilly ideas.

However, the Russians – led by Lev Mukhametov and Alexander Supin – persisted on, doing some of the most illustrative work to date on cetacean brains. Using electrodes, they mapped the auditory and visual centers in the brain. In humans, the auditory region is on either side of the brain, just above the ears, while the visual cortex is all the way in the back. Mukhametov and Supin found those areas side by side at the top of the dolphin brain. This pairing makes sense since echolocation would require close teamwork between the visual and auditory parts of the brain. But it also means that if you want to guess how a dolphin brain is organized, human brains won't be much help. In other words, the dolphin brain is like a map with no names.

“The cetacean neocortex does not have ‘neocortex’ written on it,” Marino says. “We’re talking about a very different brain from humans. You can infer something from anatomy, but it only takes you so far.”

This is clear from just looking unaided at the brains in Marino's lab. A human brain looks tight and slightly longer than wide. The bottlenose dolphin brain is nearly spherical with bulging sides split by a deep groove through the middle that almost makes it look like two brains stapled together at the bottom.

A simple dissection shows that dolphin brain has a thinner cortex than a human's. The cortex is the outermost layer, the most advanced part of the brain involved in higher reasoning processes. For scientists studying behavior and intelligence, the neo-cortex is really the only part of the brain that matters. In humans the cortex layer is itself layered, like a jawbreaker, into six tiny layers. Layer four, near the middle, is sort of the switchboard of the cortex, relaying all cortex activity. For some reason, dolphins don't have a layer four or anything resembling it.

A thinner cortex missing a layer would suggest less intelligence. Yet, as Marino pointed out, their cortex also has deep wrinkles – far deeper than humans – meaning more surface area and a better brain.

“What does that mean? What does it mean to have more surface area than thickness?” Marino says, shrugging her shoulders. “Nobody knows.”

So which is better: our thicker cortex with less wrinkles, or their thinner cortex with more surface area? This kind of work is fascinating, but tends to create more questions than it answers. Mostly these questions just sort of hang out there with no one to follow them up. After the failed mirror test, Marino decided to try and help build a better starting point using very simple measurements of overall brain weight to compare dolphins to other clever animals.

In the 1990s she used a blunt tool called the encephalization quotient to figure out how big a brain *should* be, given an animal's size. Without some understanding of what parts of the brain do which tasks, all she could do is compare large structures against one another. The fact that researchers like Marino have to rely on a crude measurement like overall brain weight is a testament to just how little we know about dolphin intelligence.

However, her results are interesting. Using just brain size versus expected brain size, humans far outstrip our ape cousins. Chimpanzees are the closest, which matches what we see in genetics and behavior. However, four species of dolphin – tucuxi, white-sided, common, and bottlenose

– are smack in the middle of humans and apes. Using this as a rough guide, dolphins are not as clever as humans, but substantially smarter than chimps.

But what about complexity? After all, what good is a big computer if the parts are outdated? In 1999, a team including Hof found that an obscure brain cell discovered 100 years prior that only seemed to exist in apes and humans. They were long spindly and appeared to play a role in social behavior. Finally, the source of primate supremacy over lesser creatures was found. Until Hof, using new staining methods that separated types of brain tissue, found them in whales. And then dolphins. And elephants. This was shocking because the nearest land relative to dolphins are hippos, which are certainly “spindle” neuron free.

Other work has reinforce this, though scientists are no closer to understanding names on the map than they were before. That may soon change. Sam Ridgeway, who himself keeps an impressive collection of brains at his Navy-funded facility in San Diego has recently managed to scan a living dolphin in an fMRI machine, the first in history to do so.

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By the late 1990’s Marino and Reiss finally got their opportunity to repeat the mirror experiment. At the New York Aquarium there would be a short window where two dolphins could be studied without outside distractions. Older and wiser now, the pair set about constructing an elaborate set of controls that would help filter out behavior that had confused them. Rather than on the face, they placed the marks in out-of-the-way places that the animal would have to contort to see in the mirror.

To ensure they didn’t misinterpret the results, some dolphins got real marks and others got fakes that left no trace. This helped counter the fact that the animals were awake when they got their marks. All the while a video camera filmed the whole thing and the scientists agreed that if what they saw failed to meet even one of a list of criteria, they would disqualify the animal.

It worked. In 2001, the pair reported in Proceeding of the National Academies of Science that two dolphins had reacted to the (nontoxic) paint as one would expect from a self-aware creature. The response was tremendous. Although some were skeptical (Gordon Gallup himself thinks the evidence is tenuous), it quickly became accepted theory.

The mirror test is just one of many metrics to understand one facet of how animals might think (self awareness). Others include memory, communication, social behavior, and a nascent field that some are calling “personality” for want of a better word.

But for some reason, the idea of dolphins recognizing themselves in the mirror resonated with people. Perhaps it was the personal nature of a mirror. Or else maybe it was that old Lilly-esque desire to elevate dolphins, but the study was almost immediately ubiquitous on websites for dolphin enthusiasts everywhere.

It also became a lightning rod for activists concerned about their treatment in the wild. Groups like the Earth Island Institute, which was behind much of the dolphin safe tuna and “Free Willy” campaigns, immediately seized on the idea. Not long after publication, Diana was approached by friend and activist, Hardy Jones.

Jones is a filmmaker and crusader for dolphins. Reiss was no stranger to crusades (she was active in dolphin-safe tuna) but, like most scientists was hesitant to lend her name to causes.

“He said, ‘You know it would make a big difference if you came out and spoke about the dolphin drive,’” she says. “I said, what dolphin drive?”

Jones showed her a grainy video of a Japanese dolphin slaughter that nearly made her ill. Believing that dolphins were competing for fish, local fishermen in the small village of Taiji, Japan, would round up thousands of the animals and hang them by their tails or hack them to death.

Reiss lost it. She immediately started showing the film to anyone who would see it. It’s unusual for a serious scientist to become the standard bearer for an animal rights campaign (usually the domain of Hollywood actors), but she was determined. One of the first people she called was Paul Boyle, head of the New York Aquarium and on the board of the Association of Zoos and Aquariums (AZA).

“This is the most inhumane thing I’ve ever seen. You’ve seen the pictures of them picking up the dolphins two or three at a time? Those animals are 12-1500 pounds,” says Boyle. “When you pick an animal like that up by its tail fluke it basically disarticulates all the vertebrae in its spine.”

This reaction was echoed throughout a normally passive research community. Herman, Ridgeway, Boyle and 439 other scientists to date have joined Marino and Reiss on a document voicing disapproval. Even the AZA, which patently avoids such activism, took stand against the practice. At the head of this were Marino and Reiss, who represented the scientific perspective and even organized a lunch for the National Press Club in Washington.

The pair began working with Earth Island Institute and activists like Ric O’Barry (featured in the Oscar-winning film *The Cove*), who are often portrayed as the green movement’s lunatic fringe. It was through these contacts that the pair learned of a dolphin sale in the Dominican Republic. A German businessman named Stefan Meister was building a sprawling casino/marine park in the coastal town of Puerto Plata. It was a giant amusement park and casino whose website boasted videos of spectacular shows and people swimming with happy dolphins.

However, it turns out that 12 of these dolphins were taken from the Japanese drive. The deal was waiting for government confirmation, and animal advocates had lined up to block the sale. The environment minister, a respected bureaucrat known for opposing corporate land abuse, invited Reiss and Ric O’Barry for a cordial discussion about dolphin intelligence and the Japanese drives. With her she brought a signed petition with Marino’s name at the top of a long list of names.

“When I got there, it seemed as though he had already made up his mind not to allow the sale,” Reiss says. “I’m not sure that we even had much effect.”

The minister was concerned about the country’s green reputation and eventually blocked the sale (though not future sales and the casino eventually bought Cuban dolphins). Reiss returned

home to her research at the aquarium. She soon got a phone call from Meister and his lawyer, Alex Penalta.

Meister and Reiss were calm and collected. It seemed that Meister had already paid for the dolphins and now had no place to put them (the Japanese aquarium apparently had no return policy). As a peacemaking gesture that she would later regret, Reiss suggested perhaps activists might raise the money to set them free (exact numbers are fuzzy, but probably \$25-75,000 apiece). At the end of the conversation Reiss hung up saying she would be in touch. "Stefan was very cordial, even charming," says Michael Brown, a New York businessman asked to act as arbiter for the conversation. "I assumed they were very close to coming to an agreement."

That did not happen. Earth Island Institute refused to raise money to support the drive and Reiss certainly had no such funds herself. She beat the bushes but couldn't find a buyer for the proverbial white elephants. Not long after, she got another call.

"It was Dave Phillips from Earth Island Institute. He said, 'so, did you get the notification that you are getting sued for \$300 million by Stefan Meister?'" she says. "I think I saw a flashing white light. I swear to God. It was the most bizarre sensation."

In fact, she and O'Barry were being sued for \$100 million each in lost revenues by Ocean World, Meister's casino. It wasn't long before Marino got a letter of her own. She was equally flabbergasted, especially since she hadn't even gone to the DR.

"They're suing us for \$100 million. Something that I would never have in a million years," Marino says.

The lawsuit came out of Brower County, Florida, Penalta's home state. Neither Marino nor Reiss lived or worked in Florida, but Penalta claimed that Emory's and Columbia's alumni associations in the state were enough to put the scientists under its jurisdiction. Needless to say, Marino and Reiss both panicked when they read the suit.

"This was very scary," says Reiss. "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. [Phillips] said, 'This is a SLAPP suit. This is being done just to shut us up.'"

A SLAPP suit (Strategic Lawsuit Against Public Participation) is a suit brought intentionally to censor critics or bury them under legal fees. Many states, like New York, have anti-SLAPP laws that allow a defendant to collect legal costs from the plaintiff if a suit is decided to be SLAPP. Florida does not. Ironically, according to Esther L. Aristy, a Dominican lawyer who accompanied Reiss to meet the minister, a lawsuit like this is actually harder to file in the DR thanks to stringent free speech laws than it is in Florida.

Then Phillips dropped insult on injury. "He said, 'You have to read the whole thing. They are actually accusing you of being a dolphin broker,'" Reiss says. "I've never heard of a broker for dolphins."

Emory University defended Marino, but since Reiss wasn't actually working for Columbia, she had to find a lawyer, who ended up being her reluctant brother-in-law, Howard Finkelstein. What followed was a bizarre lawsuit, even by Brower County standards. For two and a half years, lawyers shuttled to Florida to get the case dismissed. The judge eventually refused. The appellate court disagreed and ordered the case dismissed based on a lack of evidence that the scientists had any connection to Florida. The Brower judge, however, decided to give the plaintiff one last chance to come up with evidence, but left an open time window, essentially leaving the suit endlessly in limbo, where it sits today.

"The purpose of this lawsuit had nothing to do with forcing Diana to pay \$300 million, or Ric O'Barry or Lori Marino," says Finkelstein "The purpose of the lawsuit was to send a message."

Finkelstein estimates that the suit would have cost Reiss more than \$200,000 in legal fees if he had charged her (as is, she's paid perhaps \$20,000). Marino's lawyers probably amassed the same. He says what started as a favor has become a passionate crusade and that he secretly wishes Meister would move the suit to New York where he could argue for a jury.

The suit took its toll. For Marino, the hardest part was court disclosure.

"All of a sudden my life is an open book. They subpoenaed all of my emails and my phone records," she says, including messages to her ex-husband. "It was like someone was going through my underwear drawer."

The hardest part for Reiss was the claim she was a dolphin broker. Neither Meister nor Penalta responded to repeated requests for comment, but hints in court documents suggest it came from Reiss offering to raise money to free the dolphins. This visibly grates on Reiss, who actually helped persuade the New York Aquarium to end their dolphin exhibit.

If the Ocean World suit was meant to silence Marino or Reiss, it appears to have failed. Both Reiss and Marino have redoubled their advocacy efforts, despite raising eyebrows of their colleagues.

This is especially true for Marino, who was later to embrace advocacy but has jumped even deeper in. Like Jane Goodall, Marino has soured on captivity altogether. She now works closely with Earth Island Institute and is acting as expert witness for the legal team suing the Los Angeles Zoo. She is also promoting a sort of Cetacean Bill of Rights that would give dolphins and whales basic rights and is creating a think tank called The Aurelia Center for Animals and Cultural Change that she hopes to build into an academic program.

Her lab full of dolphin brains, however, lays empty where once it was crammed with students. She admits she doesn't have time for research but believes her work in advocacy is even more important. When asked, she reluctantly concedes her biggest papers might be behind her. "I don't think that means my biggest contributions are behind me, though," she says. "I actually think that my biggest contributions are ahead of me."

Reiss, on the other hand, is back to research (among other things, analyzing distress calls of dying dolphins) and is active in a master's program on behavior and conservation at City University of New York. She is also working frenetically to bring attention to the Japanese

slaughter, including using satellites to watch and trying to bring lawmakers and Hollywood stars on board.

Neither is afraid of the title “activist,” which may hurt their reputations in the long run. Scientists like Herman and Ridgeway say the Taiji situation is so egregious, it doesn’t count as advocacy. Gallup, Marino’s old mentor, disagrees.

“Once you become less than impartial there is the possibility that you may begin to confuse the evidence with your objectives and your goals,” says Gallup, who patently avoids any offer to work in chimpanzee advocacy. Perhaps it’s a artifact of John Lilly, but dolphin researchers must work especially hard to avoid seeming too close to their subjects. As such, activism, which claims dolphin slaughter is egregious because dolphins are so intelligent, can be dangerous. Some scientists worry this may blind them to evidence to the contrary.

For instance, recently a paper out of South Africa suggested that dolphin brain size is a result of the need to stay warm in cold water. Marino led a massive effort to refute the paper, which appeared to overlook most behavioral evidence. But Gallup and other worry that next time, Reiss and Marino could be vulnerable to personal attack.

In response, Reiss points to work she did in the 1990’s that refuted the theory that dolphins have individual “signature” whistles. Although it painted dolphins as less intelligent, she says the data simply wasn’t there to support it and she followed the data.

When I put this to Marino she sits back for a second and thinks then she simply asks, “If not scientists, then who?”