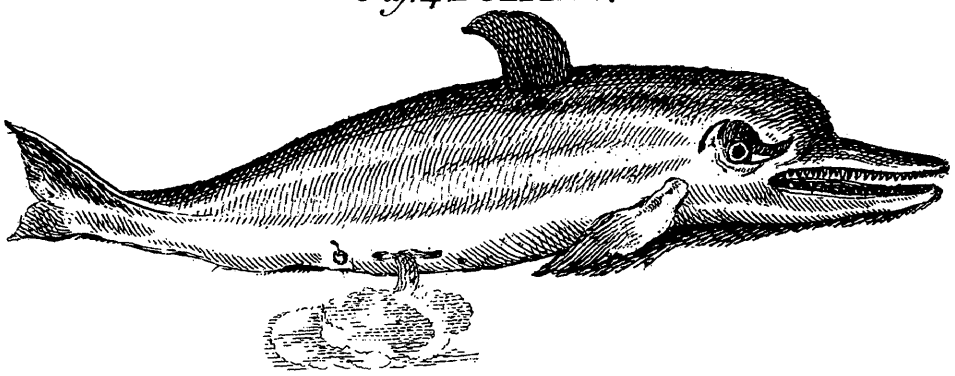
THE DARK SIDE OF DOLPHINS

Fig. 4 DOLPHIN.



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The Dark Side of Dolphins

By

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This book is submitted in fulfillment of the final project requirements for the University of Southern California, Master of Professional Writing Program.

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To my mother and father,
who thought I could do anything,
and supported me through trying to do it.

Acknowledgments

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This thesis couldn't have been completed without each and every one of you.

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Introduction

> *The butterfly's attractiveness derives not only from colors and symmetry: deeper motives contribute to it. We would not think them so beautiful if they did not fly, or if they flew straight and briskly like bees, or if they stung...*
>
> - Primo Levi, author & chemist

> *A dolphin is a healthy social mammal, and it behaves like one, including doing things that we don't find particularly charming.*
>
> - Karen Pryor, author & biologist

December 2005, and I was at the 16th Biennial Conference on the Biology of Marine Mammals. It was "video night" at the conference, an impromptu event with research footage of marine mammals around the globe; usually a pleasurable contrast to the intense scientific talks. But not tonight.

When the speaker, a woman stepped to the podium, I didn't catch her name. But I did catch the word "infanticide." I vaguely remembered hearing the hypothesis that bottlenose dolphins sometimes kill baby bottlenose. I'd dismissed it - Flipper would never hurt a baby, let alone kill it. When she said she had, perhaps, the first footage of infanticidal behavior in dolphins, I watched with skepticism. I knew some animals killed babies of their species. But <u>not</u> dolphins.

The high-def footage was taken from directly overhead, from a blimp - the latest vehicle of favor for observing whales. High

above the surface of the sea, researchers would float and videotape the behaviors of animals at the surface, using telephoto lenses and digital processing to remove any blur caused by the blimp's movement. The researchers were looking for endangered right whales - but what they saw instead was an "endangered" baby bottlenose.

The film started with an six adult dolphins (probably the mother) and a baby or calf dolphin, about half the length of an adult, swimming together. Suddenly a group of six or seven large dolphins (a gang?) approaches on an intersecting course. At least two dolphins from the new group join the dolphins with the baby - the others swim off. It's not til five minutes later that we realize that these two dolphins are trouble.

Suddenly five dolphins turn their heads toward the calf. It's as though "everyone" is staring at the baby. Three of them ram him - the impact flipping him into the air. It might look like play - but a baby getting hit that hard will have cracked ribs, not to mention internal bleeding.

It's a free for all after that - one dolphin rams the calf again, flipping it on its side. Another pushes it under water. Yet another rams it repeatedly. Finally, the calf is held under water by two adults. Are they trying to drown it? The savage attacks continue off and on for 40 minutes. The calf did not die on camera, the scientist points out from the podium, so this is

not conclusive evidence of infanticide. But with cracked ribs and internal bleeding, the baby very likely died soon after.

Was this baby the equivalent of the devil's spawn - the "Damien" of dolphins - to merit such treatment? Could any baby dolphin do something that justified adults torturing and killing it?

Was this a one-time thing?

Do all dolphins do it?

Why hadn't scientists discovered this before?

How dolphins do such a thing?

These weren't the dolphins I'd studied for the seven years. These were another animal entirely. I'd worked with Atlantic White-sided dolphins at the Steinhart Aquarium in San Francisco. They weren't angels - they did fight with each other, and sometimes left deep rake marks as they scraped their teeth on each other's skin. But this was child'splay compared to what I'd seen today.

Like many people, I like to look for the good in others, even in animals. But I determine to re-read everything about dolphins with an eye to the dark side. If dolphins could kill a baby of their own kind, what else might they be doing, that I'd somehow screened out of my consciousness?

I expanded my search for nefarious activities to include all dolphins - not just the ubiquitous bottlenose, but dolphins of all shapes and sizes. The bottlenose dolphin is just one of many species of toothed whales - the largest in its family the killer whale or orca, the smallest the four foot long harbor porpoise.

Orcas didn't start out with such a squeaky clean reputation as dolphins. These animals, also known as killer whales, are known to kill and eat other species of marine mammals (cannibalism?). They kill not only smaller marine mammals, but will even attack a blue whale (though usually a calf). Wastefully, the black and white marine park stars don't usually eat all of a blue whale kill - they eat only the tongue. These giant dolphins certainly earned the name "killers."

From my research I knew dolphins were considered to be a hypersexual animal. It did surprise me when I read about research which purported to be about male dolphin "alliances," and it turned out these alliances were focused on kidnapping females and forcing them to have sex.

Still, dolphins have never hurt people - in fact, they saved them, right? Thousands of people pay to swim with the smiling, well-meaning dolphin each year. Nothing bad ever happened to them, right? It turns out that indeed dolphins may

intentionally injure humans, sometimes even kill. Not to mention sexual harassment.

Dolphins continue to catch the imagination of the general public and scientists alike. In May 2010, a group of scientists and activists convened in Helsinki to discuss the rights of whales and dolphins. As part of their meeting, they published a Declaration of the Rights of Cetaceans (the text for this declaration can be found in the last chapter of this book), including "… cetaceans as persons have the right to life, liberty and wellbeing."[1] Do dolphins really exhibit that characteristics and behaviors that persuade us they deserve rights to be declared non-human persons? For some reason, dolphins and whales seem to be unusually important to humans.

Can the popular idea of "Flipper" be reconciled with the sexual, potentially dangerous animals that science is revealing dolphins to be? Carefully. Dolphins may not who we expected them to be. They indulge in infanticide, are highly sexual, aren't always safe to swim with, can't speak English, may have killed the enemies of the U.S., and may not be as smart as people think they are. Read on, and discover the real animal, the dolphin behind the myth and under the sea.

References

1. *Declaration of Rights for Cetaceans: Whales and Dolphins*, in *Cetacean Rights (www.cetaceanrights.org)*. 2010: Helsinki, Finland.

1. Violence in Virginia

> In many [animal] populations, infanticide is a normal and individually adaptive behavior.
> - Glenn Hausfater and Sarah Hrdy (biologists).[1]

> God forbid that any book should be banned. The practice is as indefensible as infanticide.
> - Rebecca West (author and journalist)[2]

Twenty miles south of Chesapeake Bay, we drove slowly down the beach a large white pickup with "POLICE" stenciled boldly across the driver's door. We watched the GPS for the readout to arrive at 36 degrees, 35.6 minutes north; 75 degrees, 52.1 minutes west. Closer. Closer. Officer Swain stopped the truck. Smooth blue sparkled to the left; white dunes sprouted beach grass and sea oats to the right. Such a paradise was hard to imagine as setting for violent death. Check the coordinates again, I urged.

Christine Trapani pulled a portable GPS from her bag, and double-checked. This, she assured me, was definitely the place. She knows how to use GPS - as a member of the Stranding Response Team, finding the bodies of dead or injured marine mammals and sea turtles from the beaches is part of her job.

I jumped from the vehicle onto firm white sand. From the other side of the truck I heard a splash. I ran to the water's edge. Not fifteen feet from where I stood on shore, a bottlenose dolphin slapped its tail -- bang -- against the surface. *The dolphins were waiting for us.* Was this the irritable kind of tail slap directed toward us, the kind of dolphin behavior that might be interpreted as "get away, can't you see we're fishing here?" Or was this a special tail slap, the kind a guilty dolphin might use to grab the attention of nearby associates to warn "Hey! The Feds are here. Everybody look casual."

The beach off False Cape State Park, where these dolphins now swam, had been dangerous for wayfarers in the past. Assistant Park Manager, Cameron Swain, driving the truck, told me the park received its name because 19th century mariners often mistook this area for a safe port. The actual port, Cape Henry, was 20 miles to the north. Thinking they had arrived at their destination, the mouth of the Chesapeake Bay, ships turned to shore and grounded on the sandy shoals just off the beach. It wouldn't have been out of the ordinary for beachcombers then to encounter a dead body, maybe several dead bodies, lying on the sand. The 2000-plus recorded shipwrecks along this coast earned

the perilous waters the nickname "Graveyard of the Atlantic."[3]

There were no bodies on the beach today, but it was a different story eleven years ago - May 6, 1996.[4] On this date, a three-and-a-half-foot body had been discovered. The corpse of a baby bottlenose dolphin. Not the victim of a shipwreck, but a victim, all the same. The first in a series of deaths.

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The dead dolphin had been reported to Virginia Aquarium's Stranding Response Program. Dolphins, seals, sea lions, turtles and even whales wash up on beachs frequently enough that recovery teams called stranding networks exist around the world. These teams answer the call when people find marine mammals or sea turtles on the beach. Sometimes they're alive; most of the time they're dead (95% of the time, according to the Virginia Aquariums's official volunteer requirements).[5]* If they're alive, the team

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* Stranding team work is demanding. From the Virginia Aquarium stranding team requirements: "Must be able to lift and carry 25 pounds and assist with lifting and moving larger loads(re: lifting a 700 pound dolphin into the back of a pickup truck)."

must assess and make the call as to whether a stranded animal is well enough to ever be returned to the wild. The lucky animals -- usually turtles and seals -- are driven back to the stranding center to convalesce in tanks until they're well enough to return to the wild. But most of the time the stranding team's calls lead them to the bodies of dead animals. Much of the team's job is examining carcasses to determine cause of death, then reporting findings to government agencies and scientific researchers.

Before I braved the stranding center's nauseating aroma, I met Susan Barco, the program's director, for breakfast. We chatted amicably over omelettes at her favorite local hangout. I would have pegged her for a primary school teacher: an open, friendly woman, with curly brown hair, who obviously enjoyed her work. Much of her satisfaction, she told me, came from knowing that her team's efforts were contributed to improving the welfare of sea turtles and marine mammals around the world. I realized I had somehow expected someone who worked with dead animals the majority of the time to dress and sound more gothic. How could someone who loved animals go to work every day, knowing their job was to take calls about dead and dying animals. While many of the turtles can be rehabilitated, Barco said, marine mammals, specifically whales and

dolphins, are not likely to survive a stranding on the beach. With these animals, the duty of the stranding team is to recover the body and, like coroners, determine the cause of death. Does this sound cheerful to you?

After breakfast, I followed Barco by car from the restaurant to her office. The Stranding Response Program offices are several miles away from the Virginia Aquarium and Marine Science Center. The Stranding Response building is set well back from any nearby houses and busy roads. And it's a good thing. When you get out of your car, the first thing that strikes you is the smell. Flies are everywhere. I've smelled worse, but to judge from behavior of the visiting teenagers I saw with t-shirts pulled up to cover their noses and mouths, most people haven't.

The smell of decomposing flesh is unmistakeable. One can see why it might be evolutionarily advantageous for our ancestors to instinctively avoid this smell. Decomposing bodies do not usually bode well for those around.

In this case, however, the decomposing flesh was of less dangerous origins: it came from the remains of dead bodies of dolphins, seals and turtles in nearby trash dumpsters. After dissecting the body of an animal to find out why it died, one had to do something with the leftover parts. When you dissect a dead human body to determine the

cause and circumstances of death, it's called an autopsy; when an animal is the subject, it's a necropsy. Each of the animals collected by the Stranding Response Team was necropsied for cause of death. Following the necropsy, some body parts are packaged and sent off to scientists and research institutions around the world, from a scientist "wish list." The team checks the list of wanted parts and remove and ships those pieces off. unwanted remains are then deposited into a trash container next to the necropsy area, to await the nose-holding arrival of (probably unhappy) city waste disposal workers.

Not all bodies are dissected immediately, however. Some may be put aside, and frozen whole for later examination. That's what had happened to the baby dolphin I was interested in. His death hadn't seemed unusual enough at the time to merit immediate necropsy - it wasn't until later that the body was removed from cold storage and the cause of death identified.

After a tour of the facilities, I turned the conversation to the main reason I was there - to discuss the deaths of a series of baby dolphins. Barco and I had just started talk when another staff member waved the two of us to her desk. "You're interested in the baby dolphins? Have you seen the photos yet?" she asked. She handed over a

photo album and Barco opened it to an 8 x 10 glossy of a dead three-foot long dolphin. The animal's skin had been slit lengthwise across the midsection, and the skin and underlying fat was pulled back exposing the pink and red tissues and white bone. It reminded me of a real-life version of a stuffed bear I had that started falling apart when a seam came unravelled.

Barco got very scientific. "This one," Susan explained, "showed subcutaneous bruising and multiple fractures." Dark red blotches. Broken ribs. The photo was full color: grey and white and red. Too much red. Yet the dolphin still sported a "joyful" grin.

The first dolphin with these kinds of wounds had washed up on the Virginia shore in 1996. It wasn't until a year later when someone became suspicious: Dr. William McLellan. McLellan presided over the necropsy of a "pristine" baby dolphin, the surface of its skin smooth and unmarred. McLellan described the massive damage he found beneath the skin in 2004 documentary The Dolphin Murders:

> "… complete massive fractures of all the ribs on one side. So it looked like the ribs had just been imploded into the lung. Then when you look at the lung, and the lung had this massive fracture. You could actually fracture soft tissue also. And there'd be a tear all the way across the surface of the lung. You'd take the lung out,

> and then you'd see actually another fracture, through the liver."[6]

The wounding pattern was so striking, he called in fellow professor and dolphin research Dr. Ann Pabst in to see them. "Some of the injuries were really quite astounding," said Pabst. "Fractured skulls, fractured vertebrae, a fractured ear bone - which is really one of the densest bones on the surface of the planet."[6]

Pabst called Stranding Response Team Director Susan Barco for help. Did the Team have the bodies of any other baby dolphins that had washed up in the past several years? Indeed, they had. Barco did a quick necropsy of her own, on a small dolphin that had just washed up. Immediately upon opening up the body she knew she was seeing something unusual - and mysterious. "I emailed him [McLellan] before I finished the whole necropsy and said 'you need to tell me if this is what you saw,' " Barco told me. "…I think we need some help here. We're seeing something that we don't know how to interpret." 'Send more bodies' came the call from McLellan. Bodies were sent. The hunt was on.

McLellan and Pabst contacted veterinary pathologist Dale Dunn, of the Armed Forces Institute of Pathology. His response after examining a body - "It looks like someone has taken a baseball bat and just literally beaten these

animals to death." Pabst asked Barco for more dolphin bodies. No one had noticed anything suspicious when these bodies had washed up in 1996 and 1997, but Pabst's necropsies revealed that nine of the dolphin calves had died from blunt force trauma† - that they had died from multiple impacts with a large dull object.

To recap: over several years, more than the usual number of dead dolphin calves had washed up on the beaches of Virginia. Many of the bodies were very young, dolphins less than three months old. Necropsies showed an unusual pattern of injuries in nine of the bodies.[4]

Who or what could have done this? Who would have both the motive and the means? Or just the means? The team considered a number of possibilities: sharks, boat collisions, angry fishermen, wave damage, and even underwater blasts by the military or construction. None of the suspects fit all the facts.

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† Blunt force trauma here refers to the blunt force trauma, the medical classification, not Blunt Force Trauma the hardcore punk/thrash band from Austin, Texas, although sounds that are too loud can indeed kill whales and dolphins, which rely on their sensitive hearing for survival.

If sharks or other large animals had been the cause of death, pieces of flesh - shark bites - should show up on the bodies of the baby dolphins; the bodies had few external wounds. One did have a bite mark - it had been bitten in the jaw, but the wound was not the jagged, tearing kind that could have been left by a shark.

The nets of fishermen leave signature criss-cross stripes on a trapped dolphin's skin; the skin of these bodies was smooth, with the exception of a few rake marks. Rake marks are white, parallel indentations left on a dolphin's skin by a set of teeth scraped hard enough against the skin to peel away the top layer.

As surfers know, getting caught inside a waves can indeed kill. If the wave-roll occurred on hard rocks, the hapless surfer's body would most probably suffer bruises and broken ribs, sounding comparatively close to the injuries found on the calves. Even on sand, wave rolls could cause drowning and death. But the calves showed no sign of the scraped skin that would accompany such an event. Other than the rake marks (and a bite on one calf) mentioned above, the skin of the calves was unscathed.

That left underwater construction, or military sonar blasts, as the potential culprit. While blast injuries might explain broken bones, this type of injury would not

injure in selective areas. The part of the dolphin closest to the blast would certainly be more traumatized, but any bones on that side of the dolphins' bodies would be broken. The mysterious baby dolphins had fractures to the bones around their midsections only. The blows they suffered seemed to have been intended to kill - injuries were focused on the calves' hearts, lungs and liver. This specificity pointed to a grim possibility -- that the baby dolphins had been killed intentionally.

Unbeknownst to the Virginia team, the key to these dolphin deaths had already washed up on a beach in Scotland. Between 1992 and 1996, the bodies of five baby dolphins had been found on the beaches of Moray Firth, a long narrow indentation in the eastern seacoast of Scotland that opens onto the North Sea. It wasn't the dead baby dolphins on which Scottish researchers focused: they were more concerned with the bodies of ninety harbour porpoises that had washed ashore during the same period of time. These porpoises had few external injuries, but *multiple skeletal injuries (lots of broken bones) and contusions (bruises)*. Harbor porpoises, often found in the same parts of the world as bottlenose dolphins, are significantly smaller. They look like dolphins, but adult harbor porpoises are smaller, an average of five feet in length.

This means adult harbor porpoises are in the same size range as three-month-old baby bottlenose dolphins.

So, in the U.S. they had baby dolphins washing up on shore with numerous internal injuries; In Scotland they had lots of adult harbour porpoises and a few baby dolphins washing up on shore with the same type of injuries. Lots of bodies. Lots of evidence. So who was the culprit? A few of the deceased porpoises and dolphins had similar wounds -- parallel, rake-like lacerations - when seen in adult dolphins these types of skin lesions are caused by one dolphin scraping its open mouth and teeth against another dolphin. What species of dolphin, they wondered, would be attacking harbor porpoises? The shape, size and spacing of the teeth marks was a definitive way to track down the offending species.

Ben Wilson [check on this] took a plaster cast of the rake marks and matched them to existing skeletons they had archived at [find out where]. The tooth marks were an exact match for only one dolphin species -- *Tursiops truncatus*, the beloved bottlenose dolphin. Dr. Wilson himself was shocked at his discovery: "It was, 'Oh my God, the animals I've been studying for the last 10 years are killing these porpoises.' "[7]

With this new information in mind, Scottish researchers realized they might have actually seen murders in progress - and misinterpreted the attacks on the porpoises as play. In 1995, a Scottish citizen caught a violent dolphin-porpoise interaction on video: "At first I thought the two dolphins were playing with a salmon," said Mike Hancox, "But when I looked more closely I could see them flipping up a porpoise with their beaks and battering it when it landed on its back in the water."[8]

The video of dolphins had been killing porpoises gave the researchers in Scotland a new perspective. They took a second look at the bodies of the baby bottlenose that had washed up on their shores. Their conclusion: adult bottlenose dolphins were killing not only harbour porpoises - they were also responsible for the deaths of many of the baby dolphins. The Scottish researchers were on the verge of publishing their findings when U.S. researchers called to discuss the mysterious injuries to the baby dolphins they've found. Did the Scots have any ideas to explain the mysterious injuries see in the Virginia Beach corpses? They suddenly realized that dolphin infanticide was not confined to Moray Firth.

All sorts of animals commit infanticide, not just dolphins. Lions do it. Meerkats do it. Warthogs do it. In

fact, pretty much every species of animal seen in the Lion King is known to kill the young of its species under certain circumstances. So dolphins aren't alone in this dark practice. But why kill babies?

Why do animals kill infants of their own kind? Scientist believe that behaviors like infanticide that are seen in large numbers of animals are a result of evolutionary pressures. Inheritance can determine not only anatomical features, like blue or green eyes, but can also determine an animal's behavioral tendencies. As humans, we tend to dismiss this idea - we like to think that our personalities and lifestyles are our choices -- completely independent of our genes. Most scientists, however, believe that genes are associated with behavior, and that behaviors that lead to more living offspring (children, grandchildren, etc.) for animals will, over time, become more and more common. In short - if you have more children than your neighbors, and they have more children, then more and more individuals in your neighborhood will share some of your genes (and in this case, behavior). If killing babies of its own species means that the baby killer will have more grandchildren to dandle on its knees, then at least some individuals in that species will be genetically predisposed to, well, kill babies.

When food is hard to get, and infants are around, you often get infanticide. Some animal mothers react particularly badly when stranger wants to share their milk: this is euphemistically termed "adoption avoidance." For example, when seal babies get lost from their mothers, suckling at the wrong nipple is risky - female seals bite the stranger, even though it's just a baby, sometimes leading to the desperate pup's death. Hunger (the "predation hypothesis") can drive animals to consider their own species as food: male and female chimpanzees sometimes hunt chimp babies (not their own!) to eat.

The need for things other than food can also drive infanticide. The dominant female in a wolf pack often kills the infants of the less powerful wolf females to give her offspring a better chance at life. If a wolf mother wants to make sure her daughter has a "date to the prom," she can ensure this much better than human mothers can - by wiping out any other young female that might someday pose competition.

Even the need to reproduce can lead to killing babies. In the "sexual selection hypothesis." I'm not sure where the selection part comes in, but "sexual" refers to males who want to have sex, and are willing to kill to get it. When a group of male lions takes over a pride by running

out or killing the previous males, they don't stop there. Like the Bible's King Herod, the ruling males' next step is to kill all the nursing cubs. As a result, scientists calculate, cubs are born to the usurping males eight months sooner than otherwise. This means that lionesses whose young have just been killed soon mate with the males that just killed them. What? Why? Evolutionary theorists are quick to point out that, for a female, mating with the male that just killed your baby is more likely to lead to the survival of the next child. Unlike humans, female lions don't appear to have issues about what sort of father such a lion would be, or that by encouraging this bad behavior they're contributing to lawlessness in society …

Could any of these hypotheses explain dolphin infanticide? If dolphins were the baby killers, was it a one-time thing, or something that occurs in dolphins throughout the world? Scientists have been assiduously studying bottlenose dolphins since the late 1950s; why did it take them until 1998 to discover what the dolphins were really up to? Perhaps this episode of baby-killing a one-time thing, brought on by strange circumstances. If so, what could have triggered it?

Barco has a pet theory about why dolphins might have suddenly started killing. In 1995, several years before the

small corpse showed up on the Virginia shore, a virus killed or weakened many dolphins in the local population. Susan speculates infection by the virus - morbillivirus--may have caused currently pregnant females to lose their babies, and that nursing dolphins were also vulnerable to the virus. All of a sudden the local dolphin females were single and available: they were all fertile at the same time. The following year, all the females would have been pregnant. The following summer, during mating season, it would have been slim pickings for the males.

Perhaps these sexually frustrated males were the source of the killings - unless they killed a few babies, there was no one to mate with. That's not entirely true - there were plenty of females to mate with, but no fertile females. Perhaps it's not enough for the dolphin males to mate - they may have an overwhelming drive to mate specifically with females with whom the mating could lead to offspring. An event-triggered case of the sexual selection hypothesis (see above) could explain these infanticides.

If epidemic-inspired infanticide were the case, Barco reasoned, there would be a pattern to the dolphin deaths. Babies with apparently dolphin-caused injuries washed up almost exclusively during the summer months: June, July,

and August. What were the ages of the ones that died, she wondered. From their body lengths, the animals that wash up during the summer indicate that they're about three months of age. If the virus was the trigger that started sexually-deprived male dolphins killing babies, then the number of deceased baby dolphins should decrease over time. The numbers sometimes decrease year to year, but also show spikes - perhaps coinciding with other epidemics?

Although Barco's research on this point is not conclusive, it is heartening to think that perhaps the dolphin infanticides were indeed an aberration, a result of a disease that caused an unusual change to the dolphin's social environment. Maybe fewer and fewer dolphin babies will wash ashore, until dolphin infanticide is just a faint memory. Until it happens again, however, it is nearly impossible to get any closer to the truth about the cause behind the infants' deaths.

Why did it take so long for the scientists to realize that dolphins were the killers they sought? Even dolphin biologists have trouble believing that dolphins could do anything so despised by human standards, or at least by Western Civilization standards. It's not just dolphin biologists either. Many of the biologists who study a particular mammal, after having been confronted with the

evidence of infanticide, still find ways to avoid believing such a thing about the animals with which they've spent their lives, and want to tell the public about it even less.[‡]

When it was first reported in the 1960s that langurs had been seen to kill their young, scientists hypothesized that the death of lemur babies had been brought on by stresses from human occupation of langurs' habitat by man. It was not seen as a "natural" behavior, but pathological. Jane Goodall saw infanticide in the chimps she studied, but again explained it away as an atypical behavior, brought on by stress.

Are infanticidal dolphins overly stressed, or guilty of murder? Guilt would imply that dolphins could be held to

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[‡] "The founding fathers of classical ethology -- Nikolas Tinbergen, Karl Ritter von Frisch, and Konrad Lorenz -- did not offend the public with gory stories about a brute natural world. Non-human animals, if anything, were the better humans: they acted for the good of the group and did not kill each other with the ease that humans exhibit."from Schaik, C.v., C.H. Janson, and ebrary Inc., *Infanticide by males and its implications*. 2000, Cambridge University Press: Cambridge, UK ; New York. p. xiv, 569 p.

a code of conduct that tells them that killing babies is "bad," a code of conduct that dolphin researchers have yet to uncover. In court, guilt requires not only the perpetrator's awareness that society had judged an act to be wrong.

Putting aside that we don't know what dolphin society's code of conduct is, are dolphins "aware" of what they do? That is, are they conscious? Scientists as well as philosophers differ on what abilities would demonstrate consciousness in an animal (or in humans, for that matter). One such test for awareness that dolphins *have* passed is known as the "mirror test." In the mirror test, an animal is anesthetized and while asleep, a mark is applied to its head or body that can't be seen directly by the animal, but only by looking in the mirror. For example, for a human, a good place to apply the mark would be on the forehead, since you can't directly see your own forehead. On waking up near a mirror, an animal that is self-aware will not only look at the mark on the animal in the mirror, but will try to touch the mark on itself. In early studies, only great apes appeared able to recognize themselves in the mirror.

Dolphin researchers didn't want to follow the protocol exactly. First, they didn't want to put dolphins to sleep

while they marked them, since dolphins are voluntary breathers: if you put a dolphin to sleep, it stops breathing and dies of suffocation. Instead, dolphins were trained to come to a position in their tank and wait until they got the signal that they could go. While a dolphin was at their station, they were marked with an "X" - either with a black (non-toxic) marker or with a marker filled with water. This was so changes in behavior of the dolphins with black X's could be sure to be due only to the dolphin seeing the X in the mirror, not to feeling the marks as they were put on. After the dolphins got their X's, they were released back to the part of the tank that contained an underwater mirror.

Faced (so to speak) with marks on their bodies in the mirrors, dolphins couldn't reach out a hand to touch the mark like gorillas or chimps could. Instead, the dolphins appeared to carefully examine their bodies, turning this way and that to more closely examine the exact spot where the X had been applied. It appeared they were orienting their bodies just to get a better view of the X in the mirror - which would seem, as much as touching your hand to a mark, to require knowing that what one is looking at in the mirror is indeed one's self. For primates, simply orienting themselves to look at a mark in their forehead in

the mirror would be considered a failing grade in self-awareness, but dolphin researchers concluded (as do I) that the amount of time dolphins spent looking at the mark on their bodies, and the way they turned themselves back and forth while looking, means that dolphins do indeed "recognize" themselves in the mirror. Still, it's a long jump from that to concluding that dolphins are capable of more complex forms of self-awareness, such as introspection, thinking about one's self and one's actions. Without more extensive research, it's difficult to support the idea that an adult dolphin understands the pain it inflicts when attacking a baby dolphin.

For many, it's difficult to believe that the peaceful, playful dolphin would ever hurt anything, let alone one of its own. But, because some dolphins don't appear to have the same values as those of Western society, does it mean dolphins should be considered less than human? Maybe. Dr. Thomas White, author of In Defense of Dolphins, used his book to make an argument that philosophically dolphins are as much persons as we are, and should legally be considered persons by the law. But in the light of dolphin infanticide, White undermines his own argument: "The most basic sign that we recognize someone else as a person is that we treat that individual as 'some one,' not 'some

thing.' We appreciate their intrinsic worth, and act accordingly." It's hard to imagine that infanticidal adult dolphins could qualify for personhood under this criteria - they are certainly treating the babies they attack as "some things" not "some ones."

So, dolphins aren't persons by the "treat persons as some one" criteria. Do humans qualify as persons either? Certainly some people (by definition sociopaths) treat other people simply as means to an end. And when it comes to infanticide, we'd like to think it never happens in human society, but a quick Google search uncovers countless articles on infanticide going on in today's world - in rural parts of India and China babies, usually girl babies, are still left out to die. If we deny personhood to dolphins because some individuals treat other individuals as a means to an end, wouldn't we deny personhood to humans as well. The dolphins' reasons behind infanticide remain a mystery, but infanticidal behavior has now been witnessed in two different species, the bottlenose and the Tucuxi, a dolphin found in the Amazon river. The video footage, described in the introduction of this book, is hard to watch - it seems to reflect the type of behavior seen in human mob violence. Forty minutes of a crowd of adults pummelling and suffocating an infant dolphin, half their

size. How can anyone explain it? Researchers continue to try. The leading theory continues to be that it's really about sex.

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2. Sex in the Sea

I don't want to belong to any club that will accept people like me as a member.
- Groucho Marx [1]

[When trying to have sex underwater] … it helps to have a third person around to push them at the right times with the proper vectors. Just like dolphins.
- G. Harry Stine, author & NASA consultant[2]

When NASA needed to train people to work in low gravity situations, they used the earthbound environment closest to outer space – a swimming pool, aka the Neutral Buoyancy Lab.[3] It was here, wearing weight belts that rendered them virtually weightless underwater, that randy astronauts in training are rumored to have done their unauthorized initial research on the physics of sex in zero gravity. These pioneering "scientists" found that, at least scuba-clad in a pool, Newton's third law – for every action there is an equal and opposite reaction – made weightless sex between humans tricky. They tended to "fly apart" without the aid of another person -- a facilitator. This third person, they thought would be an essential factor for successful sex in outer space.

Thus was born the Three Dolphin Club, so-named by the late Harry Stine, author and former NASA consultant, because, he said, that's how dolphins do it -- "a third

dolphin is always present during the mating process."[4] By 1996, Stine claimed to have heard from at least seven fully-qualified members, space shuttle astronauts. Not a single dolphin was among them.

According to NASA, Stine was wrong, at least about their astronauts: no U.S. astronauts, they said, had ever joined this outer space Mile High Club – these men and women were too conscious of their duties to the American people to have sex "on the job." Mary Roach researched the Three Dolphin Club eagerly for her book Packing for Mars, only to find a lack of evidence and much grounds for reasonable doubt, including the fact that dolphins don't need a third dolphin at all – they're quite capable of having sex as a twosome, thank you very much. More on this later.

So, despite the fact that millions of moviegoers saw James Bond accomplish zero-G sex in Moonraker, such outer space shenanigans by U.S. astronauts seem unlikely. On the con side, Roach argues that 1) having sex in outer space would put an astronaut's job in jeopardy; 2) even practicing in the Neutral Buoyancy lab, as Stine reported, would risk one's job; and 3) as pointed out to her by astronaut Roger Crouch, arms, legs, and, when all else

fails, even duct tape could easily be used to counteract Newton's third law.

So, Mary Roach says the evidence isn't there, Snopes says no one has had sex in space, and Cecil Adams of the Straight Dope can't find any evidence for it either. Just when one might start to despair, Roach brings up some strong points on the opposite side. Not only have co-ed teams of astronauts been in space together, married U.S. astronauts have been in space together. And refused to comment on their sex lives while in space. And know even less (if that's possible) about the spacebound sex lives of Russian cosmonauts - as Roach points out, Mir and the International Space Station both have modularized, slightly more private spaces in them than the space shuttle.

So, to summarize, Stine says he talked to several astronauts who reported having sex in space. No one will admit to having sex in space. But they probably wouldn't, even if they had, for fear of losing their jobs. NASA may avoid the question of sex in space altogether by having astronauts freeze their eggs and sperm before long, colonizing space flights - while no one knows if humans can get pregnant in space, a fetus would potentially be exposed to radiation. The levels of radiation experienced by

astronauts are dangerous to adults over long periods, but would likely be fatal to a developing fetus.

Dolphins don't need a third dolphin. Perhaps NASA should launch a study of their sexual techniques to see which might be transferable for humans in zero-G. Because duct tape can be quite painful when it's time to take it off.

In reality, there's probably little to transfer. Dolphins have, well, anatomical adaptations, that humans would find impossible to mimic (never say never). And the way dolphins actually have sex would not qualify, for most humans, as an optimal approach. Details on dolphin anatomy and sexual behavior are definitely in order.

Unlike astronauts, dolphins don't float and bounce about in the water - dolphins use their tails and flippers to gain an amazing amount of traction in the water. During my time working with two Pacific White-Sided dolphins at the Steinhart Aquarium, I learned firsthand about dolphins and their strength in water.

In the research we did, dolphins could push a "button" to indicate their interest in getting touched - "receiving tactile stimulation" was the way it got recorded in our behavior logs. One of the dolphins' favorite games to play

while getting "tactile stimulation" was tug-of-war. There was no rope involved; a dolphin interested in tug-of-war would swim to where you were on the side of the tank, then turn 180 degrees and present its tail.* You, the human, were expected to grab the tail, then pull as though you were going to drag the dolphin out of the water. Fat chance of that happening! With adults ranging in size from five to eight feet, Pacific white-sided dolphins are relatively small dolphins. At most, they weigh in at 400 pound or so. The dolphins at Steinhart were small - females - in human terms, Hulk Hogan-sized, about six and half-feet long and weighing about 300 pounds. Sheer weight along would have made it impossible for me to haul the dolphin (or Hulk Hogan) from the tank. But it was more than that, in this game, when I tried to move the dolphin's tail toward me, it not only wouldn't come further toward me, it was pulling strongly in the opposite direction! Even with its tail out of the water, the forward pull generated the fins of one of

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*Sticklers would feel compelled to point out that dolphins don't have tails - that thing at the end of their body is more properly known as a "caudal peduncle." (Try and say <u>that</u> five times fast!)

these "small" dolphins was amazing. Pulling on the dolphins' tale was a bit like yanking on a rope attached to an intractable Clydesdale - you could pull all you want, the horse wasn't going nowhere, no-how, unless it wanted to. In the next step of the game, the dolphin would pull away harder and harder. At the last second, when I knew I couldn't hold it any longer, I'd stop pulling and push the dolphin's tale up and away, and the dolphin would flip over backwards, its tail smacking the water and making a big splash. The dolphin would then resurface and swim over smiling that permanent dolphin smile. I swear they were someone grinning bigger after winning the tug-of-war! That was enough to convince me that in the water dolphins need nothing more than their finely honed physiques to push, pull and move whatever and wherever they so please.

It's easy to tell a boy dolphin from a girl dolphin once they roll over, but you've got to know what to look for. It's not as easy as sorting out puppies; the smooth underside of both male and female dolphins might throw the untrained observer for a loop. But it's easy to tell the belly of a female dolphin from that of a male, if you get a good look. In both sexes, you'll see a long slit in the

center of the lower "belly" of the dolphin. This is where the genitals are hidden away. Females have two extra, smaller slits, one on each side of the longer slit. That's where the female dolphin keeps its nipples. Keeping their sexual organs tucked away not only keeps the organs warm in cold water, but by eliminating drag allows the dolphin to swim faster than it could if it weren't so streamlined.

The most interesting changes in the female anatomy are probably in the nipples, which have the ability to squirt milk under pressure into a baby's mouth. It's the dolphin male's sexual organ that usually surprises those of our species most. Not because it's particularly big, but because it's under the dolphin's voluntary muscle control, and because it's prehensile.

Prehensile? Like a monkey's tail? Well, not quite. The Oxford English Dictionary defines prehensile as meaning "capable of prehension; (Zool., of a tail, limb, etc.) capable of grasping or holding."[5] A dolphin's penis can be extended at will and used to carry things around. Not heavy things - things like a rope or a piece of sea weed. Perhaps even to wrap around and pull on a human swimmer's leg. Some have pointed out that lacking hands, a male dolphin using his penis to carry items may just be using

the most hand-like (well, finger-like) appendage he has available.

If you're not sure you've ever seen a dolphin penis, then you haven't seen one - they're early impossible to miss. The average bottlenose dolphin penis is pink, pointed with a slight "S" curve, and 10" long. It shows up quite starkly against the grey of the bottlenose skin. As though the dolphin has acquired a pink worm as an abdominal parasite.

Male dolphins aren't subtle. When a male wants to have sex he rolls over, pulls out big pink and swims next to her pointing it toward the sky. "Want some of this, baby?" his behavior seems to say. If the female doesn't swim away immediately, the male swim in a circle, then, like a WWI fighter plane he comes up behind and under her, flips upside down again and glides toward her belly. If she's interested, she keeps swimming upright, straight ahead, and he inserts his penis quickly into her genital slit. There is little repeated thrusting like you might see in some mammals - sometimes just a one-time insertion and (presumably) ejaculation of sperm. For this reason alone, dolphins probably wouldn't have logistical problems mating

in space, presuming they could get up there and get close enough to give mating a try.

Continuing our previous saga of courtship, if the female isn't ready to have sex with a particular male, she rolls over on her back as he approaches. The message seems clear, but a persistent dolphin male won't take this as a "no," but more as a maybe later. It turns out that dolphin males might be able to tell if a "no" really means "yes." Dolphin researchers have long speculated that dolphins may use their ability to see with sound to sense physiological changes inside the body of another dolphin. A male dolphin might be able to use his own version of a sonagram to tell if a female dolphin is excited or actually disgusted by his amorous approaches.

While dolphins don't take their time with the intercourse part of sex - dolphin foreplay may occur over hours. The time two dolphin bodies are linked together in sex per se ranges from two to thirty seconds.[6] Not minutes - seconds! As Tim Cahill joked regarding the short duration of dolphin sex, male dolphins might easily be called "the most inconsiderate mammal."[3] Did I mention the dolphin penis is tapered on the end - almost pointy? Makes sense when you think they have to find an opening and

slide in even as the female continues swimming. And get done in a second or two.

If bottlenose dolphins, when it comes to the duration of sex, fall far behind humans, they make up for "lack of quality" with quantity: male dolphins have been observed to have sex eight times an hour. Bottlenose dolphins are described as highly sexual animals - so are spinner dolphins.

At the end of a long day, hundreds of spinner dolphins may meet up together whistling, leaping into the air, and, most of all, having sex. Not just a hundred-dolphin orgy - the technical term is a "wuzzle."*[7]

Dolphins have sex. A lot. "Around here almost every time we see socializing we also see what appears to be sexual behavior," blogged Adrian, a graduate student observing behavior of dolphins off the coast of Texas. "In our behavior log we don't distinguish between just plain socializing and sexual play." She went on to say, "[Today w]e saw a group of 12 or so having what can only be called

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*The word "wuzzle' is attributed to the late dolphin researcher W.E. Schevill who, when asked to describe this behavior, said "It looks like a wuzzle to me."

a dolphin orgy. Want to talk about one track minds. It did not matter what was going on around them (big boats drove by, small boat nearly drove over them) they just kept at it." [8]

If dolphins are so interested in sex, then why don't they spend more time with it? It turns out that the speed with which they complete the sex act is strikingly similar to that of their land-bound evolutionary "cousins." Both fossil and molecular studies have led to the same conclusion - dolphins are part of the same evolutionary group that includes camels, cows, and hippopotami. In this group of animals, known as artiodactyls, males don't have to "warm up" to get an erection - they can erect their fibro-elastic penises on demand.[9]

As discussed in Chapter X, Murder on the High Seas, dolphins are not monogamous. In contrast to many other mammals' situations, it's more advantageous for female dolphins to mate with any male dolphin they see in hopes of persuading him he might be the father of their current or next baby. Lest one think of dolphins as totally unromantic, it should be noted that the time leading up to sex can be long and involve lots of touching of fins, tails and pretty much everything else. Indeed, the pink Amazon

river dolphin takes romance even further - in this species, the male often carries an object in its mouth -- a clump of weeds, a stick, or (most romantic of all!) a lump of clay - as part of courting a female.[10] Researchers Tony Martin and Vera da Silva concluded dolphins were carrying things in the interest of romance when they noticed that males carried them only in the presence of females - and that object-laden males were 40 times more likely to get in fights with other males. Forty times! "It's like a guy showing off," Martin told National Geographic. "The equivalent of having a Ferrari." The other way male river dolphins have of impressing a female? By being pink. In the Amazon river dolphin, pinkness appears to correlate with scar tissue - more fights survived. And apparently female Amazon river dolphins find bad boy dolphins most attractive.

Dolphins don't only practice heterosexual mating. In fact, their anatomy makes male-to-male sex almost indistinguishable, for the outside observer, from male-to-female sex. The situation of the male's penis within a "pouch" means that male-to-male intromission can be genital-to-genital sex ("My god, they're the perfect gays!" one of my friends exclaimed upon hearing this.) It turns

out that in bottlenose dolphins, male dolphins have lifetime relationships with one or two other male dolphins. These are known as male alliances.

Does the fact that male dolphins mate with other males and have long-term relationships with them mean that dolphins are homosexual? Some think so, although to my mind while the behavior might be termed homosexual, it seems the more proper term would be "bisexual" - since they have sex with both genders apparently indiscriminately. Is this unusual among animals? Apparently not -- researcher Bruce Bagemihl, author of Biological Exuberance, a study of homosexual behavior in animals, says same-sex sexual behavior has been seen in 1500 species. [11] Homosexuality, says Bagemihl, is well documented in 500 species; the bottlenose dolphin is just one of the many.

Perhaps, particularly with an intelligent species like the dolphin that lives in a complex social structure, we should expect to observe homosexuality. In her book, Evolution's Rainbow, biologist Joan Roughgarden concludes "the more complex and sophisticated a social system is, the more likely it is to have homosexuality intermixed with heterosexuality. Any animal in a complex society has to manage both within- and between-sex relationships. Both

types of relationships are mediated through physical contact, including embracing grooming, and genital contact, as well as through vocalizations, bodily symbolism, and behaviors like food-sharing and warning calls."

Although a third dolphin is not required for either heterosexual or homosexual dolphin sex, there just might be an another dolphin around when two dolphins have sex. From behavior observed in a group of bottlenose dolphins that live in Shark Bay, Australia, male-male lifelong associations have a practical value - a dolphin's "best friend" will fight by his side against other dolphins to kidnap and coerce a fertile female dolphin. Indeed, a group of two or three male dolphins will often ally with other group(s) to fight against a similar "gang" of dolphins (one side has been seen to have up to 14 allied individuals) to win the "favors" of a female.

These male dolphins aren't gentle with the object of their desire. In a 1992 scientific paper, males were described as "…chasing, hitting with the tail, head-jerks (sharp lateral or vertical movements of the head), charging, biting, or slamming bodily into the female."[12] Biologist Rachel Smolker, in her book, To Touch a Wild dolphin, euphemistically calls this behavior "herding."[13] Two

males have to work together to get an otherwise unwilling female. "Among dolphins," Smolker points out, "a lone male would be hard-pressed to mate with an unwilling female." After about two weeks the female dolphin manages to escape and return to her podmates. It wouldn't work for just one male - as soon as he tried to feed, the female would escape, and he'd be alone once again.

"Despicable, yes, but not inexplicable," was the title of a review by primatologist Craig Stanford for a book about sexual coercion in humans and primates - it could also be a fitting comment regarding the coercive behavior seen in bottlenose dolphins.[14]

Smolker describes the coercive behavior of male bottlenose in perhaps the mildest terms possible: "Female dolphins, as in most mammals species, probably have some opinions about whom they would prefer to mate with." She concludes, "Faced with at least two or more males working together, however, a female dolphin probably has little opportunity to put her preferences into practice. Male dolphins can be so aggressive in their herding of a female that she can even be forced to mate against her will."

Smolker writes as objectively and avoids the use of the negative-connotation-loaded phrase "rape" when

describing the coercive behavior of male dolphins. In her book she does, however, lament the lack of defensive teamwork among female dolphins - "… there is no denying it. Although it seems they could benefit from helping each other, female dolphins just don't do it. I want to stand up and yell out 'Get together, sisters, and take a stand!'"* Even dolphin scientists can find the aggressive behavior of dolphin males and the passive response of dolphin females both surprising and upsetting.

The phrase "Three dolphins" crops up often in descriptions of the herding behavior of Shark Bay Dolphins. Many times three male dolphins will hang out together more than with other dolphins. Two male dolphins often work together to capture a single female dolphin, making a group of three. In this respect, it could be said that Shark Bay bottlenose dolphins could lay a better claim than humans to a bona fide Three Dolphin Club.

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*It may be comforting to know that females do team up to defend themselves against male sexual coercion in at lesat one mammal species - female alliances against coercion have been observed in the bonobo, also known as the pygmy chimpanzee.

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3. Swim At Your Own Risk

He's Opo the friendy dolphin
He's friendly as can be
If you should want to learn to swim
You couldn't do better than learn from him
He'll very soon get you into trim
And he's giving instruction free
Down at good old Opononi by the sea

- lyrics from "Opo the Friendly Dolphin" (Crombie Murdoch, 1956)[1]

In the mid-1970s, hippie drug-guru Timothy Leary scored an invite for Susan Sarandon to swim with dolphins. It all started innocently, Amy Reiter of Salon.com reported, with Sarandon taking a dip with two of John Lilly's dolphins, Joe and Rosie.[2]

"First, they had the dolphin just swim past my feet in the wading area," Sarandon said, "and then I went into the deeper area, and I stroked the dolphin they called Joe each time it went by. After he trusted me more than I took hold of Joe's fin and we glided around the tank together." Sounds like just about every captive swim with the dolphin "experience" you've heard before. Then Joe got a little more intense. "… Joe stopped swimming horizontally and pushed up against me," said Sarandon. "I thought the whole experience was just groovy until I felt this horrible pain

on my wrist, which was holding Joe's fin." Sarandon had been bitten by a dolphin.

Researchers jumped into the pool and rushed to Sarandon's aid. "I could hear them shouting, 'No, Rosie! Don't!' I looked over and Joe's mate, this huge dolphin I hadn't even noticed before, was virtually standing up right out of the water, towering over me on its rear fins," said Sarandon. "She seemed to be 12 feet tall, emitting this loud, high-pitched noise. The attendants were screaming, 'We've got to get you out!' I was afraid I was going to get my other arm broken." If Rosie had attacked her seriously, Sarandon later said, "I would have been killed instantly, as surely as if Rosie had been a shark. Apparently an enraged dolphin is incredibly dangerous." (Sarandon sounds reasonably afraid of swimming with dolphins.) Sarandon might have been able to give Jessica Alba a bit of helpful advice before she got a starring role in the Flipper movie. But Jessica figured things out for herself.

"I don't know if anybody knows this, but dolphins get excited, even when you are a human being," explained Jessica Alba, describing her experiences with dolphins on the 1996 Flipper movie. [3] "I didn't know this until I was being poked by a few of them, which was very rude." These dolphins weren't just poking her with their "noses." Alba

asked to have all male dolphins removed from the cast of Flipper - because she didn't like being "poked" as only a male dolphin could do.

Some have commented, perhaps joking, that the male dolphins' visible attraction to Alba simply demonstrates the strength of Alba's sexiness - so intense that it transcends species boundaries, in the way Captain Kirk was drawn to the creepy/sexy salt monster on Star Trek (an episode appropriately entitled "The Man Trap"!) despite the fact the alien was green and had suckers (Wired magazine called the alien "a cross between a lamprey and troll doll.").[4] Regarding hormones crossing species, there is possibly some truth to the idea -- some hormones that play a part in sexual attractiveness can be found in more than one mammalian species. So, Alba could, indeed, be that sexy. Maybe actress Jennifer Garner, too?

More recently, on The Late Show with David Letterman,[5] Garner recounted a less traumatic, but more graphic experience than Alba's. Garner was researching her role for a 1998 role for TV's Fantasy Island, in which she played a dolphin who turned into a girl. "I spent the day with that very dolphin [from the show]," Garner paused to clear her throat here, "who was a he, it turned out." As Garner sat on the side of the tank chatting with the

dolphin's trainer, the dolphin swam close to her. She reached out to feel its skin. "I had my feet dangling in the water," she continued, "and the dolphin came and swam right over my foot. I thought that was so cool!" The dolphin started swimming faster and faster around her foot. "I thought, this dolphins is really into me," said Garner. "Then," she clapped her hands together for emphasis, "the dolphin does something. And I said to the trainer, oh, I think the dolphin just peed." "No, ma'am, no," the trainer replied. "The dolphin did something," insisted Garner. "He was just saying "Mahalo," the trainer replied. "Mahalo," Garner explained to Letterman, means "Thank you" in Hawaiian.

There is an alternative to the "so-sexy females bring out the animal in dolphins" theory. Which is too bad, because then, if you weren't a human femme fatale, the hormone theory would seem to make it safe for you to swim with dolphins. And human males would definitely be safe from the attentions of male dolphins. But it's not that clear cut. Another possible reason that dolphins "come on" to humans is that dolphins are not all that discriminating when it comes to who or what they have sex with. If you've seen the King of the Hill episode in which Hank Hill has a close encounter with a dolphin,[6] you probably haved the

impression that dolphins, at least cartoon dolphins, use slightly different criteria than humans do in assessing the sexual attractiveness of partners.

The behavior of dolphins in swim-with-the-dolphin programs is unpredictable at best. Some places appear to be much safer than others, however. Until I met Dr. Amy Samuels, it had never occurred to that swimming with a dolphin could be hazardous to your health. Maybe they should come with a warning label. When Samuels, a Woods Hole Oceanographic Institute research, told me about the 1995 study on the safety of swim-with-the-dolphins programs in the U.S., I found the list of behaviors she and Trevor Spradlin had used in the study particularly worrisome … along with the more expected "kiss," the list included aggressive behaviors such as "body-slam" and "ram," then progressed to the more suggestive "erection," "mount," and "beak-to-genital propulsion" (please tell me this only happened between dolphins!).[7]

The safety study of five swim-with-the-dolphin programs found that while little "risky" behavior was seen between dolphins and swimmers at the three more highly structured swim programs, the other two, where dolphins could improvise what they did during their social time, had quite different results. At one program, almost ten percent

of the time dolphins interacted with humans, they were being submissive - that is, dolphins were flinching or fleeing in response to the approach of humans. This is risky, because a scared animal can quickly become an aggressive animal. The fifth swim-with-the-dolphins program, however, had the most frightening statistics. In this program, 60 percent of the social interactions were classified as risky. Eight percent of the time humans were in the water, dolphins were exhibiting aggressive behavior. Aggressive behaviors, as defined in the research, included bite, body-slam, and dolphin-initiated rams. Dolphins in that same program were seen to exhibited sexual behaviors toward other dolphins or human swimmers, 50 percent of the time.

Don't think you're safe from dolphin attentions because you're a man. Male dolphins are not selectively heterosexual in their interests. For example, in 1999 a male surfer reported a too-friendly dolphin had tried to "rape" him.[8] Apparently, he survived the aggressive friendliness with his honor intact. The victim now strongly recommends surfers wear a wetsuit while surfing.

Did the dolphin realize the surfer was male? Rest assured, not only can dolphins detect physical differences using sonar. (Some swim-with-the-dolphin programs

discourage pregnant women from swimming with dolphins, probably because the dolphins often become fascinated with the woman's distended abdomen, gathering and echolocating on her stomach, executing their own version of a fetal sonagram.)

Wild dolphins are often the friendly, benign marine mammals we read about, but too often, the dolphins that hang out with humans become trouble.

In March 2008, Moko, a solitary dolphin seen regularly off the coast of New Zealand, piloted two stranded pygmy sperm whales away from the beach and out to sea. He received nothing but kudos from his adoring public. If a dolphin is thoughtful enough to do something like that, you'd think it would be safe for you to swim with it. It was, until a year later, Moko started kidnapping people. Things would seem fine, a woman (usually) would be swimming with Moko, next thing she knew he'd start pushing her out to sea. Moko stranded one woman on a buoy a mile from shore, and she had to be rescued from hypothermia.[9]

Similar stories abound: Jotsa, a female dolphin in then Yugoslavia attacked women who tried in her interactions with men. Donald (aka Beaky) liked to take swimmers for tows on his dorsal fin. Unfortunately, he usually took them out to sea. Georges, a dolphin seen

anywhere from the coast of Ireland to the coast of Holland, is incredibly amorous toward women, and has earned the nickname "Randy."[10] The World Society for the Protection of Animals wanted to relocate Randy to France - not because of his skill with *l'amour*, but because French law prohibits swimming with wild dolphins.[11]

There's a progression to the ways lone, sociable dolphins behave. They start out like the dolphins in books and stories, but once they get used to humans, they become the dolphins of news flashes and scary movies.

1. **All Alone**. First a dolphin starts "hanging out" by itself in a new area; this in itself is unusual for dolphins who are highly social and rarely sighted far from their pod. In this stage, the lone dolphin may follow boats from time to time, but will not directly approach humans.
2. **Curious About Humans**. Next, the dolphin starts following boats regularly. Although people begin to approach the dolphin, the dolphin keeps its distance. The dolphin appears curious about humans and their associated objects.
3. **Fun for Humans**. In the third stage, a dolphin begins to associate closely with a few humans in the area,

allowing these humans to touch it, sometimes even towing them in the water.

4. **Danger to Humans.** If the dolphin becomes famous - at least among humans the fourth and most dangerous stage will likely ensue: a number of strange humans start approaching the dolphin; rather than the "friendly" ways it interacted with people before, it now interacts in aggressive, dominant, or even sexual ways. It may bump, bite, or even try to have sex with swimmers. It should be noted that some solitary dolphins never get to this stage.(Summarized from "Managing Human Interactions with Solitary Dolphins"[12])

Are these dolphins attracted to humans because they're so smart? This would be a difficult proposition to support. Male bottlenose dolphins, in particular, are highly sexual and have few boundaries when it comes to sex with animals other than dolphins -- having been seen to try to mate not only with humans, but with smaller dolphins of either gender, boats and turtles. Yes, turtles. Not giant turtles - and not the right end of the turtle either. Imagine the poor turtle pulling his head back into his shell, only to find a part of the dolphin following him in!

Interspecies sexual activity is initiated by bottlenose dolphins not only in captivity, but in the wild. Male bottlenose have been seen to "gang up" on juvenile spinner males and attempt to have sex with them. The smaller, put-upon dolphin doesn't appear to be a willing participant.

In addition, wild dolphins that appear to prefer human companionship to that of their dolphin cohorts, often become not just sexually affectionate, but sexually aggressive with humans.

If one still finds it difficult to believe that Flipper would force unwanted attentions on a woman. YouTube can show you otherwise. No, not the joke video of a dolphin out of the water, looking for all the world like a dog humping someone's leg: this video begins with a pastoral scene, a shapely 20-something bathing beauty giggling as a dolphin swims nearby.[13] At first, the woman laughs with embarassment as the dolphin moves its beak toward her crotch, the way one might when a dog tries to get too friendly with your leg. Her embarassment quickly turns to anxiety when she can't get the dolphin to stop.

Despite her frantic efforts to ward him off, the dolphin continues to nose and rub up against the woman. She turns her body back and forth, trying to avoid its touch. A

nearby man, noticing her distress, swims to her aid. He gathers her up in his arms, and uses his body to block the dolphin. The dolphin, of course, can swim much faster than the man can turn. The video ends as man and the woman work together trying to thwart the dolphin's repeated attempts. One assumes that nothing worse happened.

Can you be sure you'll be safe if you swim with dolphins? One 1996 survey found that 96% of swim-with-the-dolphin tourists "enjoyed the program."[14] The survey supplied no information as to why the other 4% didn't have a good time. It seems that the odds are pretty good that you'll have safe. Is there a way you can improve the chances of a good experience?

There are a few questions to ask about any swim-with-the-dolphin program:

1. How many participants are in each session? Fewer is better.
2. How much dolphin/human contact is offered? What kind of contact is involved?
3. Is there a free, unscripted social session (according to Samuels' research, these sessions are the most dangerous). Or will there be a professional animal trainer present and actively involved in all interactive sessions? (better)

4. Will there be an orientation before the program starts?
5. Have you spoken to anyone else who's experienced a swim at this program? Can the program provide you with references?

Finding a program that sets up a safer environment for human-dolphin interaction will greatly increase your chances of a safe swimming experience. No person or institution can guarantee that you'll be 100% safe while swimming with a dolphin. It's a wild animal. Perhaps like the thrill of petting a lion or skydiving, the inherent danger in swimming with dolphins should be considered an integral part of the pleasure.

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4. Why Dolphins Don't Speak English

She was young and beautiful, he was intelligent and athletic. It wasn't until a month after they'd moved in together that things started to change. Sound familiar? Nothing had prepared Margaret for the way Peter stopped listening to her. Then Peter quit talking altogether. Should Margaret pack her bags and move on? After all, they weren't married… Margaret didn't see that as an option -- she took commitments seriously. She had decided to live with Peter of her own free will; she wouldn't leave him just because things had gotten tough. It wasn't just another case of men are from Mars, however: women are from Venus, but Peter was a dolphin.

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When dolphin researcher John Lilly offered Margaret Howe the chance to live in a (water-filled!) house with a dolphin, it must have sounded too good to be true - want to live with a dolphin and teach it to talk? Dr. John Lilly studied physics and biology at the genius-magnet California Institute of Technology, received his medical degree from University of Pennsylvania, then later trained there in psychoanalysis.[1] At UPenn, Lilly pioneered technology that, via an electrode inserted into the brain of a living animal, allowed scientists to see brain electrical activity on a monitor for the first time ever. Sounds cool, unless *you*'re the one with electrodes in your brain and wires sticking out of your head.

In 1954, following the brain-electrode work, Lilly turned his attention to isolation tanks, also known as sensory deprivation tanks.[2] Isolation tanks are essentially large,

unlit boxes filled with body-temperature water. Once you're floating in the water in the isolation tank, and the door closes, you're surrounded by darkness and silence; after floating in the water for some time, even your body seems to drop away. Extended stays in isolation tanks lead to hallucinations, which Lilly found fascinating; Lilly didn't just research the effects of isolation tanks on others - he was his own subject for many of the experiments. It was the time he spent in isolation tanks that spurred Lilly's interested in dolphins - mammals who floated in water all the time.

In 1955, Lilly turned his attention to exploring the brains of dolphins and was funded by the National Institute of Mental Health. His research was initially delayed, because it required surgery on the dolphins: the first several dolphins died as soon as they were anesthetized. It took several tries before Lilly came to the realization that the dolphins were dying because dolphins are *voluntary* breathers. When a human is knocked unconscious, he continues breathing, even if he's underwater and this causes him to drown; an unconscious dolphin stops breathing altogether. This might seem counterintuitive, but if you spend your life in water, taking an unplanned breath could easily end your life. So how do dolphins breathe when they're asleep? It turns out they've evolved the ability to sleep with only half of their brain at a time. Dolphins sleep with one eye open! An

undisturbed dolphin (in the wild) never becomes totally unconscious. Having found this out, Lilly introduced an artificial respiration component and was able to continue his work on dolphin's brains.[3]

In an extension of his work at UPenn, Lilly's initial experiments with dolphins entailed inserting electrodes into their brains. He had to develop a methodology for getting the electrode through the skull of the dolphin. To do this, he hammered something like an icepick to make a hole through their skulls using a carpenter's hammer (you know, the kind you have at home for hitting nails into the wall). A description of this process by Dr. Giorgio Pilleri, director of the Brain Anatomy Institute of Berne, seemed to imply it was a little inhumane: "the dolphin was held down but tried to jump up at every blow - not because of the pain, but because of the unbearable noise produced by the hammering."[4] Remember, no one suspected at this time that dolphins were highly intelligent - even Lilly himself. They saw dolphins as simply another lab animal.

The U.S. military took a great interest in Lilly's research - it later became apparent that their idea was to use electrode stimulation of the dolphin's pleasure center to control it. A viable connection to an animal's pleasure center would allow the military to control an animal with a deadly payload on its back to whatever destination they desired.[1]

Lilly had continued his isolation tank experiments, and in 1964 added a new element to them - Lysergic acid diethylamide, commonly known as LSD. In contrast to today, it was legal for him, or anyone else, to use the hallucinogen as he or she saw fit: LSD wasn't listed by the U.S. as a controlled substance until two years later. At the time Lilly started using it, LSD was under heavy investigation by psychiatrists as a possible psychotherapeutic drug. Lilly even tried LSD as a therapeutic for Pam, a dolphin who avoided contact with humans since being shot (three times!) with a spear gun as part of her participation in the Flipper TV series.[5]

When Lilly discovered that the a defense contractor, Sandia, had already done "mind control" experiments with a mule controlled by electrodes, he saw why the military had been so interested in his dolphin work.[1] He closed down his brain research and went independent, opening a dolphin communication research lab in St. Thomas, the Virgin Islands. It was at this lab that he would propose 10 weeks of dolphin-human cohabitation to see if this would let a dolphin learn English.

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What caused Lilly to suddenly think that dolphins could learn English? Because he heard a dolphin speaking English. To be more precise, when he and a friend listened at half speed to recordings of a dolphin with an electrode in its brain, they

heard what sounded like English words and phrases. From this tape, Lilly was convinced that dolphins, with the right approach, could be taught to learn English. Immediately he and an assistant started testing dolphins on their ability to imitate human syllables. But the dolphin wasn't learning quickly enough.[5]

Lilly proposed a human-animal living situation, probably because there had been limited success in teaching English to chimpanzees when they were "raised" in a human household. When Winthrop and Luella Kellogg raised a seven-and-a-half month old chimp, Gua, along with their own ten month old, Gua had trouble speaking, but their son, Donald reportedly started behaving in a more chimp-like manner.[6] I imagine Luella Kellogg had something to do with termination of the Gua experiment after only nine months, with no words learned. (Donald was able to speak normally when he grew up.) In a 1947 experiment, Keith and Cathy Hayes had a smidge more success: a home-raised chimp named Viki was able to learn the words mama, papa, cup and up.[7]

Lilly's "flooded house" for the cohabitation experiment was not really a house, but several rooms of a laboratory. he had constructed for dolphin research in the Virgin Islands, with the unusual feature of a dolphin elevator.[8] Although there were no buttons inside for a dolphin to push (it did require a human

operator), it was the only one of its kind, allowing a dolphin in water to be moved easily to the second floor of the lab.

Howe was invited to be part of the experiment. Not as a dolphin expert, but as a dolphin non-expert. "Up to that time she'd seen dolphins briefly, in a Florida dolphin circus," Lilly wrote later of Howe. Before the experiment, Howe had worked as a restaurant hostess, where she met famed astronomer and extraterrestrial intelligence proponent Carl Sagan. In the course of their conversation, she had confessed that she wanted to work with dolphins. Sagan was taken with her, and though the romance he desired didn't take place (according to Sagan-biographer William Poundstone[9]), Sagan recommended Howe to Lilly's lab manager for a job. Lilly hypothesized that a person from outside the scientific community might succeed better than one formally trained in science, because he or she would have fewer preconceptions. In addition, he thought women in particular might have better luck than men in breaking the communication barrier, because he felt it would more closely mimic the context in which a human baby learns English. "We have several dedicated women at our laboratory who give 'tender loving care' to the dolphins under all sorts of conditions," Lilly wrote. "I have rather an ideal 'mother' over at St. Thomas who is quite willing to live with them [the dolphins] and to give them very close attention." [10]

Lilly's experiments in dolphin cohabitation are described in great detail in Lilly's book, Mind of the Dolphin. Howe spent the next eight months working with Lilly's research dolphins - Peter, Pam and Sissy -- before she embarked on this unique experiment. An area of Lilly's lab had been modified with the idea that three areas were needed for a dolphin and human to live together: a deep water area where the dolphin could relax, a dry area for the human to relax, and a shallow water area where the two could both navigate. To walk from room to room one had to wade through deep water. The channel depth was a compromise - while humans found it easier walking in 16 inches of water, a pilot study found this depth was not quite deep enough to keep the dolphin's skin from drying out. For the final experiment, the water depth was increased to 18 inches. For Howe, this made the water in the passages knee-deep, and an effort to walk in.

DAILY SCHEDULE

Following is an outline of the daily schedule to be followed, subject to later changes by Miss Howe.

7:30 Miss Howe gets up, washes, eats.
8:00 to 8:30 Recorded lesson with Peter, five pounds of fish.
9.00 Miss Howe daily cleaning, vacuum, etc.
9:30 Miss Howe does feeding, notes, protocol, check workmen.
10:00 to 10:30 Miss Howe and Peter play . . . involves some lessons.
11:00 Miss Howe and Peter outside . . . together but relaxed.
11:30 Miss Howe gets lunch.
12:00 to 12:30 Recorded lesson with Peter, five pounds of fish.
1:00 to 2.30 Miss Howe sleeps, fun, write, read, relax.
3.00 to 3::30 Recorded lesson with Peter, five pounds of fish.
4:00 to 4:30 Time spent working with Peter.
5:00 to 5:30 Miss Howe works on notes, bills, tomorrow's schedule.
6.00 Miss Howe has dinner.
6 30 Games with Peter, visitors, reading . . . always with awareness of living with Peter.
End of day and work is over, the two are still together.
10:00 Bed.

Above schedule to be followed Sunday through Friday.
Saturday is a free day for Miss Howe; Saturday night sleep with Peter.

From The Mind of the Dolphin[8]

For the pilot experiment, from March 20-27, 1965, Howe lived with a dolphin named Pam. At this point, Howe had been working at Lilly's lab for a year and two months. She had been placed in charge of the lab by Lilly in October of the previous year. Pam was a shy dolphin - shy because she had been traumatized. While playing a stunt dolphin for the TV series Flipper, Pam had been harpooned three times, so that the main Flipper dolphins wouldn't get harpooned. Surprisngly, after the Flipper segment, Pam avoided people so strongly that she wasn't useful for TV any more, and had been donated to Lilly. By the end of the week of living together, Pam's behavior had changed: Margaret felt the experiment was showing signs of success, and reported "Toward the end of the week, we were both loosened up to the point of Pam demanding attention of me."(p.224)

For the 10 week experiment, Peter, who had also played TV's Flipper, was the subject.

Peter was best described as willful. "Peter is his energetic self and a bit nippy on the toes." Howe says that she used a broom to keep the thousand pound dolphin's teeth away from her body.

Howe's goal for the five categories of words for Peter to learn were:

- Numbers (one to five)
- Personal names & pronouns (Peter, Margaret, me, you)

- Greetings (hello, bye-bye)
- Objects (ball, toy fish, bucket, bobo clown[1], kinipopo, baby block)
- Verbs (speak, listen, go, come, give me, etc.)

"Lessons have gone fairly well," Howe wrote in her journal, ". . . I start with counting and shapes. I am stopping, however,

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[1] "Bobo clown" and "kinipopo." Were these words picked as part of the training because Lilly and Howe thought they'd be easy words/phrases to learn, or because they were fun to say? Kinipopo, as you might suspect, is not strictly English - it's the Hawaiian word for "ball." The label "kinipopo" was probably chosen to have a second word for a different ball, since they already called one simply "ball." But couldn't someone have chosen a word that might be easier to say than "kinipopo?" And why did they have a bobo clown toy in the house? This was probably the ubiquitous blow up toy of the 60s, about three feet high, that, due to weight at the bottom, had the single property of popping back up after it had been knocked down. Four years before this experiment, a famous Stanford study used bobo clown toys to study of the impacts on children of watching bobo clown dolls get "beat up." The flawed experiment asked whether children who saw adults punch the bobo clown were more likely to become abusive themselves.

for the moment . . .[to] go back and get Peter into the habit of listening. Speaking. He seems to have lost his sense of conversation. He often overrides me. One thing at a time. I cannot teach him if he is going to yell every time I open my mouth. He has said, for the tape . . . one clear word, "BALL." Peter also learned to say "one" and "wa" by the end of week two. The language learning was going relatively well; Howe, however, suffered from bouts of cabin fever, depression and fatigue, most likely from her enforced isolation. She consoled herself with the thought that Peter's education was proceeding successfully.

It wasn't until the fourth date, er, I mean - the fourth *week* that there is any mention of a significant change in Peter's relationship to Howe. Howe wrote, "Peter has become sexually aroused several times during the week, and I have thoughts and questions on this …"[2] In a separate summary she wrote, "When you expose yourself to a dolphin twenty-four hours a day, you are becoming the 'other dolphin' in their life…. You

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[2] Was Peter the dolphin "in love" with Howe? If so, he eventually got over her - he later "propositioned" Carl Sagan, or at least that's how Sagan, in Carl Sagan: A Life in the Cosmos, described what happened in a later swim he took with Peter.

are a constant companion and must make your peace with the dolphin as such."

In the fifth week, it became clear that it was time for Howe to make her peace. "I find that his [Peter's] desires are hindering our relationship," she wrote. "I can play with him for just so long now and then he gets an erection and the play/lesson is broken." Did she discuss this "sex problem" with Lilly? It seems inevitable, since they spoke by phone nearly every day of the experiment.

How committed to the project was Howe? "One basic project is expressed," wrote Lilly, "by the 'mother' involved as 'no matter how long it takes, no matter how much work, this dolphin is going to learn to speak English.' " Quitting did not appear to be an option.

Did Lilly have any suggestions to Howe's regarding the problem? No response is recorded, but elsewhere in The Mind of the Dolphin Lilly hints at what his advice might have been: "We must be able to face the sex life of the dolphins as we face any other aspect of the dolphin's lives…. We must also realize that this interest of theirs can be turned to interspecies communication advantage even as it is turned to advantage in interhuman communications." See the dolphin's interest in sex not as a problem, but as a teaching opportunity …

Howe's concern about Peter's erections turns out not to be how to, well, touch him in such a way as to "satisfy his needs." Apparently this had been part of their interactions previously in the deeper main pool below. But in the shallower "flooded house," Howe had no way to brace herself against Peter's strongest movements involved in him relieving himself against her hand or foot. She describes the method objectively:

After a week or so of failure in involving Howe in his reproductive intentions, Peter intelligently modified his approach, and calmed his ardor. "Peter's sexual excitement usually begins with the biting business, and my stroking him," Howe wrote in her research journal. "Now, however, when his penis becomes erect, he no longer tries to run me down and knock me off my feet, rather he slides very smoothly along my legs, and I can very easily rub his penis with either my hand or my foot. Peter accepts either and again seems to reach some sort of orgasm and relaxes." It's possible that Howe was intimidated by the older, more educated Lilly, into this method of continuing the research. It seems unlikely, however, considering the strength of opinion expressed by Howe in a conversation with Lilly: "'Look, John, I am devoting my time, my energy, my love and my life to working with Peter, Sissy, and Pam. I want no interference with my aims for that work. If you want to do your experiments on solitude and LSD, please keep them in the

isolation room. The rest of the laboratory is devoted to the dolphins and to my work with them.'"

I'd like to say Howe's "sacrifice for the greater good" resulted in the breaking of the code between the species. The results, were in fact, quite disappointing. In retrospect, perhaps the experiment should have used a female dolphin - although there's no data on whether or not female dolphins develop language earlier (as in humans), at least sex wouldn't have been such a problem. With everything she did for science, Howe was never able to get Peter to develop an English vocabulary - while he learned to mimic intonation and syllable count, it was hard for him to enunciate any words well enough (beyond "ball" and "wa") to be understood out of context. This was easily surpassed in 1967, when two professors at the University of Nevada, Reno, raised a chimp in their home as if she were a human child: the chimp, Washoe, learned 130 different words.[11] But Washoe couldn't "say" any of the words - she used American sign language.

Still, with the limited success, why didn't anyone go on and teach the dolphins more English? Several reasons exist. It might easily be attributed to Lilly's concern that (1) the military might try to use language to control dolphins; and (2) that keeping dolphins in captivity was bad (he released them soon after this). In actuality, the reasons dolphins don't speak

English today may have been that Howe was too attractive. Don't forget it was through Sagan's interest in her that she got the job. Lilly was married, and working much of the time in Florida and in isolation tanks. But a single man did come into Howe's life while she was working with Peter and the other dolphins. For, The Mind of the Dolphin, Lilly had hired a photographer to take pictures of Howe and the dolphins; Howe and the photographer met, fell in love, married: ipso facto, no more dolphin-English research.

Later Lilly relented on his captivity concerns, and worked with captive dolphins to teach them an intermediate, computer-generated language, results of which were never published.[12] Dolphin research today focuses on sounds dolphins spontaneously make in the wild or captivity. If anyone today is following in Lilly's and Howe's footsteps with regard to dolphin language research, they're not talking about it.

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5. The Dolphins of War

"Cry 'Havoc!' and let slip the dogs of war…"

- Shakespeare in Julius Caesar

"The U.S. Navy does not now, nor has it ever, trained dolphins or any other marine mammals to kill, harm or injure human beings."

- Tom LaPuzza, Navy public affairs officer for the Marine Mammal Program[1]

The swimmer slid noiselessly through the water, and hid behind a dock piling. But he couldn't hide from what followed. Something approached and pushed a metal apparatus against the diver's leg. It clamped on and a bright light began to flash. The diver could now be spotted from miles away. Captured. The audience on the pier - scientists, students, marine mammal aficionados - broke out in applause. The "enemy" had been caught by a member of the U.S. Navy's elite MK6 team - by a bottlenose dolphin.

When I had heard that dolphins were going to be deployed in the Persian Gulf to protect U.S. ships, I felt kind of proud. This seemed a positive role for dolphins - keeping the U.S. warned of any enemy divers who approached to attach limpet mines (so-called because they magnetically stick to the side of a ship, like limpet snails stick to the side of a rock). In Bahrain, dolphins had worked to scout

out floating enemy mines. The dolphins seemed relatively safe, and they helped make sailors safer.

When I been doing dolphin research in the late 1990s, I spent several days at the Naval Oceans System Center in San Diego where the Navy trained its dolphins. There were some sixty or seventy dolphins there are the time, in large pens (about 24 by 24 feet). The pens were made of mesh, and kept the dolphins in the bay water itself, rather than off in a concrete enclosure. It didn't seem all that bad, I thought as I sat listening to the underwater whistles, squeaks, and clicks made by a dolphin named "Toad." The dolphins could see and hear dolphins in the adjoining pens. The water was real sea water, not "canned". I watched as trainers, followed by dolphins, took small motor boats out to sea each morning. The staff told me that dolphins in the military were used as "sea dogs" -- guards, pointers, and retrievers - guarding ships in port; pointing out mines or other debris; and helping retrieve lost items at the bottom of the ocean. Seemed like an extension of the mythical role of dolphins - protecting and saving sailors in distress.

But what if dolphins weren't just passively finding bombs or detecting enemy swimmers? What if they had been trained as killers?

When dolphins were swept from their enclosures by rising water during Hurricane Katrina, The Guardian, a British newspaper, reported that the loose dolphins were in fact trained Navy dolphins, and might be both armed and dangerous.[2] Leo Sheridan, the "respected accident investigator" told the reporter the situation was quite serious. "'My concern," Sheridan said, "is that they [the dolphins] have learnt to shoot at divers in wetsuits who have simulated terrorists in exercises. If divers or windsurfers are mistaken for a spy or suicide bomber and if equipped with special harnesses carrying toxic darts, they could fire….The darts are designed to put the target to sleep so they can be interrogated later, but what happens if the victim is not found for hours?" Sheridan was right about one thing - if there were such a thing as killer dolphins, and if they were loose, that would be bad.

If the Navy had trained dolphins to wear and shoot soporific darts, would they leave unsupervised dolphins

swimming around with live dart guns attached? While the story caused a stir in some parts, it was mostly treated as a joke.

MSNBC's Countdown anchor, Keith Olbermann, took it upon himself to investigate the facts, interviewing Moby Solangi, president of the Marine Life Oceanarium in Gulfport, Miss.[3] The dolphins that were washed to sea by hurricane Katrina were not, in fact, Navy dolphins but dolphins from the aquarium supervised by Solangi. Olbermann seemed amused by the whole idea. At one point he asked Solangi, "Make sure I'm right on this one point here, that dolphins could not actually fire poison dart guns, even if they are wearing them, even if they are loose, because they don't have hands. Am I right about this so far?" Did it take a dolphin expert to answer that? Seems pretty clear that if hands were a prerequisite to weapon use, then dolphins would certainly be ruled out. Perhaps Olbermann assumption was not correct…

Sparked by former dolphin trainer Rick Trout's assertion that dolphins were being mistreated by the military, the July 26, 1990 episode of "CBS This Morning" featured a segment on the use of dolphins in the

military.[4] Trout brought along what he called a facsimile of the weapon that dolphins were trained to wear for what was euphemistically termed the "Swimmer Nullification" Program. "This fits onto their snout. Out of this end can come a .45 bullet. On impact it ejects a .45 bullet," Trout explained. A second piece would float to the surface and act like a buoy to mark the spot the enemy diver had been "encountered" by the dolphin.

The device described by Trout works like a tiny that fires on impact. It's remarkably similar to a "bang stick," a shark avoidance the Navy used to provided its divers. In a 2007 interview in Wired magazine, diver Douglas Peterson described the effects of a Seaway (the brand provided by the Navy) bang stick on sharks:

> "I saw a shark, no correct that, including the film footage, I saw dozens of sharks cut in two… up to 12' long. The one I saw hit in the water was struck above the gills and it literally blew the head off the shark, he rolled over and sank with the head barely attached by a tiny piece of skin tissue. In fact, of the dozens I saw killed in the test film all but a few simply stopped moving and sank instantaneously usually in two chunks."[5]

Read that paragraph again, this time substituting the word "diver" for shark. Gruesome thought. It wouldn't take

much to modify a bang stick tip -- to move it from a spear shaft to a cone that fits over a dolphin's "snout," much like that device described by Trout. A quick Google search of "bang stick" will find you a place you could buy one today - when I searched, I most enjoyed the classified ad that read "Bang stick it' always buy youe side when you need it when your in a compromizing spot.[sic]"

The obvious problem with a snout-mounted bang stick is dolphins' extremely sensitive hearing. Once a dolphin fired at an enemy diver, the underwater sound could easily deafen it; at the very least the dolphin would be traumatized and unlikely to ever be willing to do the same thing again. While the Navy might, as Trout alleged, have tried out this weapon with a dolphin, it would be a very expensive anti-diver approach, with dolphins being much too expensive to train for a single use. Using a dolphin as an underwater gunfighter would likely be a costly one-shot deal.

This doesn't sound like a sustainable way to use dolphins to deter enemy divers. In fact, Commander Ted McCarley of the Navy Marine Mammal Program, told CBS they'd *never* trained dolphins to use specialized firearms, or

anything other anti-diver weapon: "The Navy is not now, and never has been engaged in training the dolphins to kill or attack anything in the water."[4] He did, however, mention in passing that military dolphins had been deployed to the Persian Gulf and to Vietnam. Vietnam? There were dolphins in Vietnam?

According to Frontline, Dolphins have indeed been deployed to Vietnam "to perform underwater surveillance and guard military boats from enemy swimmers."[6] There had been rumors of a "swimmer nullification" program, but the Navy denied it. Rumors? I looked hard, but the article had no details on this program. In The Rose-Tinted Menagerie, I found specific information about dolphins being trained to attack: "after detecting an intruding diver, the animals were trained to pull off his face mask and flippers, tear the air-supply tubes, and finally 'capture him for interrogation.' "[7] This book, however, was published by a publishing house that specialized in animal welfare-related books, making it suspect as to whether the description of military dolphin behavior was factual or exaggerated for effect. Another passage from Menagerie described "… dolphins

were equipped with large hypodermic syringes loaded with pressurized carbon dioxide. As the dolphin rammed an enemy frogman with the needle, the rapidly expanding gas would cause the victim to literally explode."

Could military dolphins at one time have been trained to "explode" divers? When Harris B. Stone, then director of research and development plans for the Chief of Naval Operations, was confronted by National Geographic with this allegation, he unhesitatingly replied "Nonsense!"[8] National Geographic, in the same article supplied more details regarding the methods of swimmer nullification - dolphins, rumors said, had been sent to Vietnam to kill enemy frogmen. Dolphins were trained to wear a hollow lance on their beaks that they then rammed into an enemy swimmer. On impact, the swimmer was inflated by the attached gas cartridge and then a corpse, instead of a buoy, marked the spot the enemy swimmer had been encountered.

Stone admitted they did use dolphins in the military: "We have deployed porpoises in open-ocean work. We are making use of their remarkable sensory capabilities. But we are not about to telegraph how and where and what they're

used for." I'm surprised he felt safe talking about the CO_2-syringe-exploding diver concept at all. Wouldn't the Soviets want to know?

Why would someone make up such a crazy story? A CO_2 inflating syringe? Stone had the answer - he pulled out what the National Geographic article described as "a diver's knife in a black plastic sheath. In place of a blade a keen arrowlike point tipped a hollow metal shaft; the hand grip held a carbon dioxide cartridge." Stone explained "I think I can show you what started it. It's a dart the Navy developed to protect divers against sharks. You can now buy it in dive shops. But somebody had to make a James Bond thriller out of it!" Another anti-shark weapon on a dolphin? Does the logical basis for the rumors make them seem more likely to contain a grain of truth? Stone finished by echoing the party line: "The Navy has never used porpoises for anything that would harm either the animals or any human being."

What was the original source of these attack dolphin "rumors?" Had more than one person asserted that dolphins were running around with CO2 cartridges? Who had interviewed them? The National Geographic article mentioned these

rumors, but not where they came from. Each story mentioned rumors of dolphins with syringes, but failed to cite the original reference.

The Rose-Tinted Menagerie chapter mentioned several sources, one of them Dr. James Fitzgerald, who had worked with dolphins for the CIA and the Navy.[7] A Google search of the combined keywords "Fitzgerald" and "Dolphins" turned up, as the last item on the first page, the summary of a court case:

> James W. FITZGERALD, Appellant,
> v.
> PENTHOUSE INTERNATIONAL, LTD. and Meredith Printing Corporation and Meredith Corporation and Bob Guccione and Steve Chapple, Appellees.

It turned out that one source of the rumors - the article I'd been looking for that had the original information about "killer" dolphins, the one that Menagerie merely alluded to - was an article in the June 1977 issue of Penthouse magazine.[9]

"The Pentagon's Dangerous Pets," written by Steve Chapple, opened with dawn over Cam Ranh Bay, Vietnam, as dolphins scanned the water for enemy frogmen. It describes the dolphin pens, the setup in great detail. Then it

describes what happens when a dolphin spots an enemy diver: "one dolphin pokes its Coke bottle nose into a cone conveniently placed in a water-level weapons rack. The lancelike cone is tipped with a heavy gauge, hollow needle that is connected to a high-powered CO_2 cartridge similar to those that are used to blow up rubber rafts." Chapple quotes "the military" as to what happens when the diver is pierced as "after ripping the muscle planes of the tissue apart," the "continuing expansion of the gas brings about the prolapse of the colon through the rectal orifice, while the stomach in turn is caused to balloon out through the mouth." Basically the inside of the diver inflates.

The effects of this weapon sounded disturbing likely those of the Farallon Shark Dart, a deterrent device the Navy had provide its divers for use while retrieving astronauts from water landings. From a forum post by a diver had personally seen its effects - "This had two effects, the first was a change in buoyancy that floated the shark out of the immediate vicinity and rendered it unable to maneuver, the second effect took advantage of the fact that sharks have no fascia holding their organs in place so the gas (if

injected in the belly aft of the fin) would turn the shark "inside out" and leave it chomping on the guts that were blown out of it's mouth."[10] The similarity of the two descriptions, the Penthouse article describing inflation effects on a human and the forum description describing effects on a shark, could make you wonder if the dart had ever been used on a human, or just imagined. (But still pretty grisly either way!)

A video showing the effects of something very like the Farallon Shark dart is available on the internet. It's for a knife tht has a hole in the tip and is attached to a CO_2 cartridge - the WASP injection knife. If you go to YouTube and type "WASP Injection Knife vs. Watermelon" you can see what happens when a watermelon is stabbed with a Wasp Knife.[11] It's surprising that such knives are legal in any country. And horrifying to think of an unexpected underwater attack from such a weapon.

The Penthouse article outlined several key details of the swimmer nullification program:

- Dolphins had been deployed for fifteen months in Vietnam, during which time there were no *successful*

attacks. (Successful, one might assume, in view of the swimmer…)

- The Navy had started with the idea of a switchblade mounted on a dolphin's nose, graduated to a the idea of a toxic dart, before settling on the CO2 inflation needle.
- Two U.S. swimmers in Cam Ranh Bay had accidentally been "nullified" when dolphins mistook them for enemy combatants.

Dr. James W. Fitzgerald, of Fitzgerald vs. Penhouse lawsuit fame, makes his appearance in the story as the man who was asked by the CIA to train the dolphins to be killers. Which he did. He had a training facility in Key West, and, after the CIA was done training dolphins, allegedly made overtures to Latin American to see if they wanted to buy their own killer dolphins. Alleged, because this was the subject of Fitzgerald's lawsuit against Chapple and Bob Guccione, publisher of Penthouse.[12] Fitzgerald alleged that Chapple had libeled him - by unjustly accusing him of espionage. In the "Pentagon's Dangerous Pets," Chapple stated that Fitzgerald wasn't prevented from trying

to sell the dolphins, not because it was sanctioned by the government, but because "The Pentagon couldn't possibly object for fear of exposing its whole operation." In the lawsuit, this was equated to accusing Fitzgerald of espionage against the United States.

Two sources were cited for the Penthouse article - Fitzgerald and Michael Greenwood, former Navy dolphin scientist. Not long before this article was published, Greenwood had testified before the Senate in a special hearing on dolphins in the military.

Two people said dolphins had been trained to kill enemy divers. Two out of the hundreds, maybe thousands, who knew the truth firsthand (except any dead enemy divers). Of course, they'd all been sworn to secrecy. Can it be believed that dolphins are capable of doing such terrible things, even unknowingly?

Unless the Navy confesses, it is nearly impossible to say what the U.S was doing with dolphins; it appears we can be much more certain what was going on in the Soviet Navy. Some U.S. personnel believe the spark to the Soviet Navy's development of a dolphin program was the translation of

Lilly's book, Man and Dolphin,[13] into Russian. Lilly mentioned not only how smart dolphins were, but also that part of his research had been funded by the U.S. Navy. Whatever the inspiration, once the Russians started, the CIA watched closely to see what they'd do. A document analyzing their capabilities was recently declassified; strangely, though, there is no mention in this document of training dolphins to attack enemy divers. Perhaps any text that might refer to this is hidden beneath the still-classified, blacked-out portions of the document. Fortunately for us, there are former Soviet dolphins trainers who are happy to "tell all."

In 2003, keeping the U.S. Navy dolphin program afloat cost taxpayers $15 million per year; with the fall of the Soviet Union, Soviet military dolphins became an expensive luxury. In January of 2001, CNBC interviewed a former Soviet dolphin trainer and found out that Soviet dolphins had, in the past, been used to search out mines, to plant explosives, and to attack enemy divers.[14] The country of Ukraine inherited one of the Soviet's secret dolphin centers, and after the fall, some of the dolphins starved

because to death, said Captain Valery Kushev. As a result, Kushev says the dolphin center has had to focus on creating its own income. "Behind every task we ask of the dolphins now is money," he said.

In the Russian dolphin center, dolphins not only perform for money; they help heal. Lynsenko, a former medical officer, says that dolphin's sonar stimulates hearing in humans, and he may be right. Katya, the eleven-year-old deaf girl interviewed by CNBC asserts -- "I can hear the dolphin's voice." Lynsenko claims that not only can deaf children "hear" the dolphins, but that in 70% of children, exposure to dolphin sonar actually improves their hearing. And people are willing to pay, to the tune of $10 per child per therapy session.

The CNBC interview, unfortunately, didn't mention any details of what methods the dolphins might have been trained to use on enemy divers. A 1998 article in the London Independent, reported that Doug Cartlidge, a UK-based dolphin consultant, saw the setup firsthand when he was called in as a consultant to the Ukraine dolphin center.[15] Did the dolphins carry a syringe to attack enemy divers? No,

Cartlidge said, they carried a clamp, much like the one I saw demonstrated in use by the U.S. Navy dolphins, but with a lethal twist … dolphins carried a clamp which "…was designed to attach itself to the diver when the dolphin bumped him in a way that it could not be removed, and in it was a device about the size of a table tennis ball capable of injecting the high-pressure charge of CO2 into the diver's body." This should sound very familiar. Cartlidge added "This [injection of the CO2] was not done immediately, however, because the preference was to take any intruders alive. Only if a search failed to locate the enemy, or force him to the surface, was the device activated remotely." Once the CO2 was injected, Cartlidge went on, the diver would be brought to the surface, "But it would be with his guts spewing out both ends."

Following Cartlidge's statements, it seems safe to conclude that dolphins have indeed been used, at least by the Soviets, to kill enemy divers. The description of the Soviet CO2 inflation attack sounds eerily like the Penthouse article. Did Soviet generals read Penthouse? The appearance of truth in the article may have indeed created the truth of

dolphins being armed to attack enemy divers, not, as written, in the U.S., but in the Soviet Union.

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Over and over again, Navy personnel have denied that the U.S. Navy ever trained dolphins to kill enemy divers. After reading this for the tenth time, I started seeing a pattern. Almost always, the spokesman followed the text, "The U.S. Navy has never …" But wasn't it the CIA that Fitzgerald said hired him? Could it be that the U.S. Navy feels comfortable denying killer dolphins because in fact it was the CIA that trained the Swimmer Nullification dolphins used in Cam Ranh?

Under the Freedom of Information Act, I requested documents regarding dolphins used in the Vietnam War from both the CIA and the U.S. Navy. Both groups reported they have no records matching this description.

But they admit the existence of dolphins in Vietnam. If government organizations deny that dolphins were trained to swimmers, where else could one find the truth? The briefings given to Creighton W. Abrams, senior commander of the U.S. Army in Vietnam during the Vietnam War (aka police action)

are transcribed in Lewis Sorley's the Vietnam Chronicles: the Abrams tapes, 1968-1972. It's still not clear if dolphins were actually killing enemy swimmers, but the person briefing the general describes rumored attacks possibly even more sinister:

BRIEFER: Describes several instances of swimmer-emplaced mines and demolitions in various waterways, then use of trained dolphins to interdict enemy swimmers. Five U.S. Navy-trained Atlantic bottle-nosed dolphins arrive at Cam Ranh Bay on 19 December 1970 in Project Shoretime. Shows film clip made in Hawaii of "swimmer defense system." Dolphin takes a "nullification device" to attack swimmer with barb and strobe light from the rear. Tried them out in the vicinity of the ammunition pier at Cam Ranh Bay. "The enemy has been led to believe that the dolphin is trained to attack a male swimmer's privates. Our latest information has it that the enemy plans to counter this by employing female swimmer-sappers in the future. In light of this information, the navy has a contingency plan to respond with male dolphins."

ABRAMS: I've seen dolphins at a park in Hawaii. "Remarkable animals." [16]

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6. Dimwitted Dolphins

Perhaps, what makes them [dolphins] so intriguing to such a broad spectrum of people is their superlative compatibility with the ocean, an environment that is so attractive but foreign to us, and their high level of intelligence, which is obvious even to the non-scientist.
- Jessica Sickler, et al.[1]

Dolphins smart? Ha!
- August 17, 2006, Headline in The Globe and Mail.

In the summer of 2006 Dr. Paul Manger, a scientist from South African, declared that he had found the real explanation for the bottlenose dolphin's unusually large brain: it wasn't because they were unusually intelligent, or because they used extra neurons to process sounds to image the sea around them, or even because dolphins need the extra room for memories since they don't ever fully sleep. Dolphins have large brains, this scientist proposed, because dolphin's brains have extra cells to help them stay warm.[2]

Newspapers grilled Manger regarding his controversial claim. What about the seemingly intelligent behavior of dolphins, they asked. How did he explain that? Dolphins, he responded, are dumber than goldfish. "You put an animal in a box, even a lab rat or gerbil, and the first thing it wants to do is climb out of it," Manger told Reuters. "If

you don't put a lid on top of the bowl a goldfish will eventually jump out to enlarge the environment it is living in, but a dolphin will never do that. In the marine parks the dividers to keep the dolphins apart are only a foot or two above the water between the different pools." Stupidity, he said, is the reason that dolphins are often unintentionally caught by tuna fisherman. "If they were really intelligent they would just jump over the net, because it doesn't come out of the water."

If leaping over barriers makes goldfish more intelligent than dolphins, then the guppies I had as a kid were geniuses! I especially enjoyed watching the male guppies, with their huge, flowing, multicolored tails. Every once in a while, one of my favorite guppies would disappear. I didn't know where they'd disappear to, until it was time to move the aquarium. Behind the aquarium stand, I found the tiny shriveled bodies of several of these brilliant fish.

Manger's area of expertise is neurobiology. This was his third scientific paper on the anatomy of the dolphin brain. The two previous papers were co-published with Dr. Sam Ridgway, a veterinarian with the Navy's dolphin program - a man who has been working with dolphins and studying their brains and behavior for more than forty years. So

perhaps, I thought, he had plausible reasons to make such an outrageous claim.

The paper Manger wrote that caused all the hullabaloo was entitled "An examination of cetacean brain structure with a novel hypothesis correlating thermogenesis to the evolution of a big brain."[2] Thermo - meaning "heat" and genesis - meaning "creating," so thermogenesis means "creating heat." Just what the newspapers had said - Manger's theory was that dolphin brains got big to keep warm. Thirty million years ago, he pointed out, the oceans cooled; around the same time, fossils show that the brains of dolphin's ancestors showed a significant jump in size. Coincidence? Manger didn't think so. In addition, his anatomical studies found that the dolphin brain, while big, didn't show the cells he associated with complex thinking. Instead it was overloaded with glial cells, known as the "glue" of the nervous system. Glial cells are found in the brain, but are not neurons themselves. They're critical to brain function because they keep neurons going - holding them in place, providing nutrients, repairing structural problem. So, he reasoned, the overabundance of glial cells shows that dolphin brains are full of fluff- insulation - not full of neurons … or intelligence.

Although his premises appear rational, his paper's conclusions still seem a bit extreme. I couldn't help feeling I had stepped into the middle of an ongoing argument. This wouldn't be the first time the subject of dolphin intelligence had provoked feuds between scientists: during the 70s and 80s, Dr. Ronald Schusterman, University of California, Santa Cruz, and Dr. Louis Herman, University of Hawaii, had a legendary intellectual feud. Whenever Herman, who studied dolphin cognition, published a new experiment showing that dolphins had superior cognitive abilities, Schusterman would duplicate the experiment and its results - but using sea lions. This provoked many a heated debate at marine mammal meetings, and a talk by either of them was guaranteed to be well attended, not only by cognitive scientists, but by anyone who enjoyed watching a good fight.

Was this paper, I wondered, the beginning or middle of a feud? Did Manger really believe dolphins were relatively unintelligent, or was he promoting an outlandish view in his newspaper interviews to get attention? If so, he got it. An immediate response by Paul Watson of Sea Shepherd, an ocean conservation group, was entitled: "Dolphins Dumb? Scientist is Dumber."[3] Watson, a bit miffed by Manger's assault on dolphin's mental abilities, noted sarcastically

"I guess all the world's great cetologists [scientists who study whales and dolphins] just have no idea what they are talking about. At least according to Manger, who claims to know a thing or two about brains, but apparently knows very little about dolphins." A more studied response appeared two months later in the New York Times.[4] Franz de Waal, an Emory University professor who has extensively studied primate behavior, who offered guess that the motivation behind Manger's claims might be insecurity, "Could it be that the huge size of the dolphin brain, which exceeds ours by 15 percent or more, threatens the human ego?"

Manger baited his hook and hoped to pull in 10-pounder - it wasn't nine months later he must have realized he'd hooked a whole school of fish - 16 different whale and dolphin researchers banded together to write their opposition to his assertions. The final sentence of the paper seemed to contain a bit more of a personal attack than is usually seen in scientific writing. "Rightfully oblivious to Manger's contentions," the group concluded their argument, "cetaceans [whales and dolphins] continue to provide an enormous body of empirical evidence for complex behavior, learning, sociality, and culture." Manger didn't seem chastened by this jibe; before the month was out he had penned his rebuttal entitled "Conflicted Reasoning by

Cetologists." Manger: "The last sentence [of their paper] transcends the mystical, cetaceans being "rightfully oblivious" to my theory. Do the authors believe cetaceans heed their claims?"

How can scientists, who are supposed to be objective, have such radically opposed views? How can scientists looking at the same evidence come to such different conclusions? To be objective, one must try to put aside one's assumptions, or at least re-examine them in the light of new facts. But it's clear, right? Dolphins are intelligent, so Manger must be wrong. But how do you *know* that dolphins are intelligent? Is it possible that you've been misled?

Most people in America today believe that dolphins are intelligent, perhaps the most intelligent animals (other than humans); however, that's not what Americans always believed. Not until John Lilly started telling stories about dolphins, telling the world how smart and amazing they were. When he started his research in the 1950s, little was known about dolphins. No one suspected dolphins were highly intelligent -- Lilly's first experiments, funded by the Navy, involved the insertion of large electrodes directly into brains of living individuals.[5]

After several years of invasive research, Lilly became convinced he'd been performing torturous experiments on intelligent animals and gave up his previous research methods.[5] Now an evangelist for the species he'd been experimenting on, he waxed poetic about dolphins' intelligence and potential to communicate with humans, even proposing that dolphins could learn to speak English (for more on this, see chapter 4). Lilly's books on dolphins caught the imagination of scientist and non-scientist alike: *Man and Dolphin*, *Mind of the Dolphin*, and *Communication between Man and Dolphin*.[6-8] The TV show *Flipper* contributed to the popular perception that dolphins are highly intelligent - after all, Flipper was obviously smart, even smarter than Lassie. Is the idea that dolphins are intelligent a lie?

When the question of human intelligence is discussed, the intelligence quotient (IQ) is the unit of measurement, although not everyone agrees as to its infallibility.[9] With IQs, bigger is always better. Many people with relatively high IQs don't realize that the IQ score itself is a ratio - your IQ is a ratio of your intelligence against the intelligence of an "average" human of the same age.[10] Unfortunately, a generic version of this test has not yet been developed that can be used to compare human

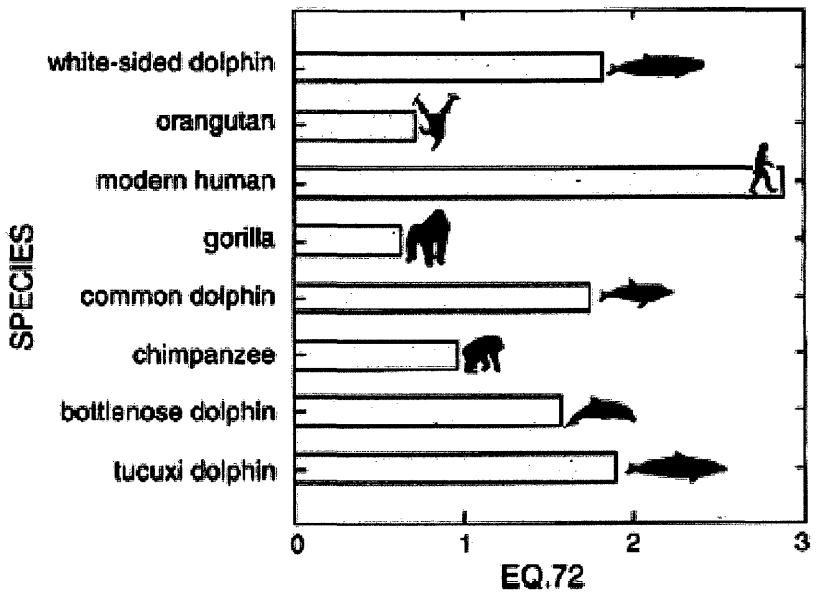
and animal IQs (imagine a dolphin trying to pick up a square peg and put it in a square hole!). How do scientists begin to compare intelligence between different types of animals? They observe behavior, test animals with experiments that require different types of thinking, and, like Manger, examine the animal's anatomy for clues to its mental abilities.

So, is the animal with the biggest brain the smartest animal? As far as absolute size, whales, dolphins and elephants beat humans easily, with the sperm whale coming out on top with a brain size of 8 kilograms,[11] about 5 times that of an average adult human. But absolute size isn't the whole story. The size of an animal's body in some ways drives the size of the animal's brain, since the muscles and sensory nerves in the body need to be represented in the brain as well. The bottlenose dolphin, if asked, would probably prefer to have its intelligence evaluated purely according to brain weight (size): the average bottlenose weighs in at a hefty 4 pounds,[12] leaving humans' 3 pound brains in the dust.

Simple brain-body mass ratio is another way scientists have used to infer intelligence from physical measurements. If an animal has a body that weighs ten pounds, and a brain that weighs half a pound, then its brain-body mass ratio

would be 0.05. This was the first ratio scientists used to predict intelligence. Using this measure, the tiny shrew, an animal hardly renowned for its intelligence, came out with a one of the highest brain-body mass ratios with a brain ten percent of its body mass (human's weigh in at a meager 3%).[13] Scientists looked for more equations that would better predict intelligence from brain and body size (and appropriately showed humans at the top of the predicted intelligence scale).

A more reliable way of using brain and body mass to predict intelligence is the encephalization quotient, or EQ. EQ equations differ from scientist to scientist. Who has the biggest EQ? Humans, of course. As mentioned previously, the shrew has a higher brain-body mass ratio than ours, so researchers modified the formula - used logarithms to account for the fact that, as bodies get bigger, you don't need quite such a proportion of the neurons just to take care of sensing things and moving muscles.



The encephalization quotient or EQ is one way scientists try to answer the question, who's the smartest of them all? From Marino, 1998.[14]

Lori Marino, a dolphin neurobiologist, proposed her own formula for calculating relative EQs of primates and dolphins.[14] Using Marino's EQ.72 equation, humans still lead with an EQ of 2.88, with bottlenose dolphins making a good showing at 1.58, while chimps lag behind at a dismal 0.97.[15] The bottlenose, however, was not allowed to rest on its intellectual laurels as most intelligent among the cetaceans. According to Marino's calculations, the bottlenose EQ is exceed by two other dolphin species - at an EQ of 1.89, the tucuxi (Sotalia fluviatilis), a small dolphin native to rivers of the Amazon basin, followed closely by the Pacific white-sided dolphin (1.82) and the

common dolphin (1.74). Somebody ought to be checking out these species instead of just the bottlenose - maybe we're missing some dolphin geniuses there!

As Manger points out, even the EQ has loopholes.[2] It's not just the size of the brain relative to the body, but which parts of an animal's brain are bigger. If an animal has an extraordinary sense of smell, for example, an inordinate part of its brain may be devoted to smell. As a result, a skilled "smeller" could have a relatively large brain, but not be particularly intelligent. Manger looked closely at the dolphin brain and found it wanting for intelligence-related areas - wanting, he explains, because the bottlenose brain doesn't have a true neocortex, the seat of advanced thinking in the human brain. The "thinking part" of the brain in humans and other primates is the part closest to the outside, the neocortex. It's the part you see in brain photos that looks rolled and wrinkled, as though someone had left their brain laundry in the dryer too long before folding. The outside layer of the brain in dolphins, Manger asserts is not made up of thinking-type neurons but of supportive glial cells. So he believes it's not used for advanced thinking, but for keeping their brains warm. He says "to-may-to," Marino says "to-mah-to." They've both looked at the same evidence and come to

opposing conclusions. How can anyone know how intelligent an animal is?

For most people, seeing is believing. What an animal does that demonstrates intelligence is much more convincing that its relative brain size, interesting as that may be. Dolphin cognition researchers can list a myriad of ways that dolphins have demonstrated intelligence, among them language capabilities, tool use, self-recognition in a mirror, grasp of difficult concepts, and the ability to navigate complex social structures. All of these are strong evidence of dolphins' superior intellect. None of this research convinced me, however, of dolphins' unusual mental capabilities as much as my own personal experiences with two female Pacific white-sided dolphins, Amphi and Thetis.

Amphi and Thetis were part of an exhibit at the California Academy of Science in San Francisco, where I did my master's degree research. The research project concerned the effects of giving captive animals, in this case dolphins and the harbor seals with which they shared the tank, a way to control their environment. In this case, we provided the dolphins and seals with a large "keyboard" that allowed them to "ask" for things - anything from fish to play toys to music or dolphin sounds. The research in itself was quite successful, but it wasn't the study itself

that surprised me. It was the way the animals turned the project around at one point - and appeared to study the researchers.

The "keyboard" itself looked more like a xylophone than a keyboard. It consisted of 3½" diameter pieces of PVC pipe that gradually increased in length. Each of the "keys" was attached to a crosspiece so they could swing back and forth if touched hard enough, and activate a magnetic switch. Any of the animals could "push" a key, and would get, depending on the key it had pressed, a fish, a ball, a ring, tactile stimulation (a researcher would "pet" the animal if it was a dolphin -- seals, in general, are too likely to bite), a water jet sprayed onto the surface of the pool, or one of three types of sounds - pop music, classical music or Pacific white-sided dolphin sounds.

Each of the items was offered for 45 seconds. With the objects, such as the fish, ball, or ring, removing the object after the time limit expired was a bit more effort than just turning something on or off. A long-handled net was used to scoop the object from the water after 45 seconds, unless some animal pressed the button again, extending the time. The dolphins got quite excited when the person with the net went to remove the ball, pushing it quickly to the opposite side of the pool, and blowing huge

"bubble bursts" when the net came near it. One day the dolphins apparently thought they'd figured out our rules for the research and decided to put them to a test.

On this day, Amphi pushed the button that corresponded to ring. The ring was a red plastic ring that she could easily put her beak or flipper through. Today, however, she ignored it. She ignored the ring for 40 seconds. At 40 seconds, she threaded her flipper through the ring, swam to the bottom of the pool (where the net couldn't reach), rolled onto her side, and looked back at us. What, she seemed to be saying, will they do now? As a scientist, I noted that this, if a true interpretation, required the dolphins to not only be able to accurately estimate of passage of time, but also the analytical ability to actively do experiments to test their own hypotheses. As a normal person, I wondered if we were studying them or they were studying us. That level of intelligence, or whatever you call, was just eerie to see in an animal, even a dolphin.

Goldfish intelligence is the one thing that no one in the media addressed when Manger's said dolphins were dumber than goldfish. Like "aging yuppie," "goldfish intelligence" might appear to be an oxymoron, the cognitive abilities of

goldfish and some of their close relatives might surprise you.

It didn't surprise me to find that scientists deemed rats to be smarter than goldfish. What I didn't know was that research has shown that goldfish don't at all lack memory - in fact they can successfully learn to run underwater mazes.[16] Has anyone shown that dolphins can learn underwater mazes? There's no reason to think they can't, but no one has even tried.

You might not know it, but goldfish can do tricks, even some dolphin-type tricks. Dean Pomerleau, an animal trainer whose training techniques have won him time on the Today Show and BBC's Animals at Work show. The trained goldfish can go through hoops, push a soccer ball across an underwater field into a goal, and even swim a slalom coursethrough posts. Pomerleau's top goldfish student, Albert Einstein, was submitted by Pomerleau to the Guinness Book of World Records as the world's smartest fish. Einstein was accepted, but given the significantly less impressive title "Fish with the Largest Repertoire of Tricks." You can see Albert Einstein in action on YouTube and judge for yourself if the Guinness people shortchanged him - just search for "Albert Einstein goldfish" and go from there. If you're really inspired, you can buy the kit

to train your goldfish to do crazy things for only $29.99 (plus shipping) at www.r2fishschool.com.

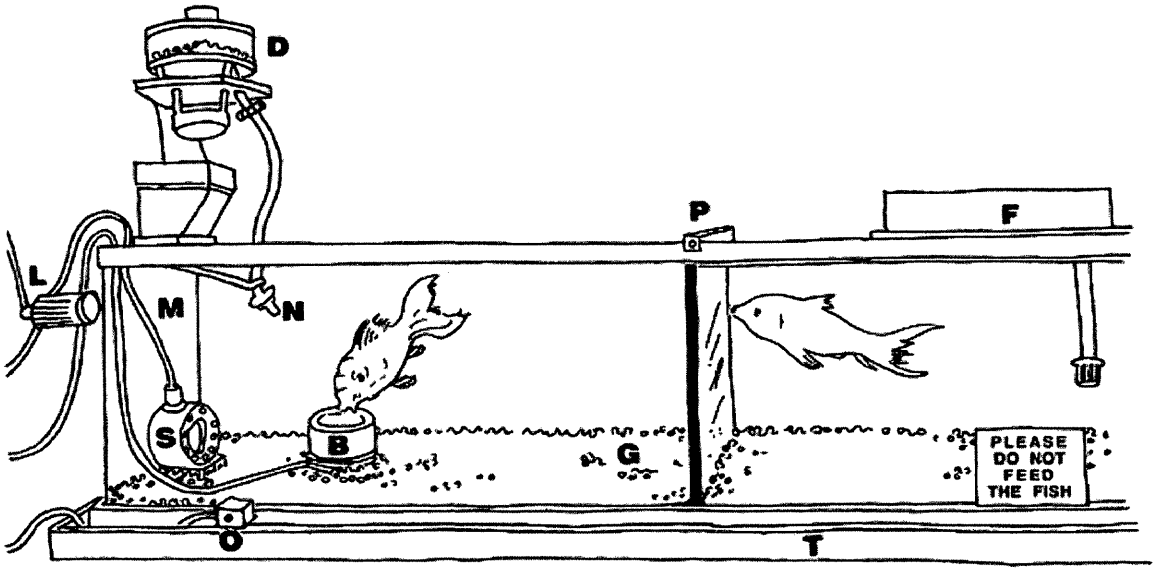
The most amazing fish story of fish intelligence isn't about goldfish per se, but koi, their larger cousins. Both goldfish and koi are domesticated from a group of fish found in Central Europe and Asia. But koi live much longer than most goldfish. Where goldfish can live from seven to ten years, koi can live for centuries, with one koi reported as surviving longer than you and I probably will - to the ripe old age of 226. 226 years.

This is important because there's a trend in the animal kingdom for animals that live longer to be more intelligent. If an animal normally lives for only a few weeks, there's no reason to bother to learn about or adapt to your environment. If an animal normally lives for a hundred years, the ability to learn and remember become more advantageous to its survival.

In 1995, Ava Chase invited me to the fish research lab at the Rowland Foundation, a Cambridge, MA-based, non-profit research organization started by Edwin Land, inventor of the Polaroid camera. The lab was filled with aquaria and esoteric-looking mechanical/electrical equipment. Chase herself was a bundle of energy, brown-haired with alert dark eyes: she reminded me of a friendly

sparrow, and I have expected her to tilt her head to the side from time to time as she talked about her research.

Koi, she said, have the ability to recognize people. I saw this myself, or thought I saw it, when we walked in. As Chase approached their tank, two 10-inch long koi swam to the top of the tank, looked at her, and blew bubbles at the surface. "They're happy to see me," she said. I listened skeptically, but they did seem happy to see her. But happy to see her in particular? Or just happy to see any person, since people, for koi, are associated with food.



Researchers designed a setup so fish could click a button to show whether they think they're hearing blues or classical music. From Chase and Hill, 1999.[17]

Using an underwater "survey-taking" apparatus, Chase had found out something that no one else knew -- that koi

could tell the difference between blues and classical music. They were first trained to tell the difference between John Lee Hooker and Bach, then trained to further generalize the music types. Music was played back on an underwater speaker (S). At one end of the kois' tank was a button (B). When the koi pushed the button and got a correct answer, a pellet of food was dispensed at (N). If the koi answered a question incorrectly, it got a timeout - a time when they weren't asked any new questions, and couldn't get more food. Over time, the koi were able to discriminate reliably between blues and classical music, about XX% of the time. Chase never mentioned which type of music the koi preferred …

Chase had also trained koi to examine a photograph and decide whether it had humans in the picture.[18] These fish could find people in pictures that seemed to require real thinking - Chase didn't just show them portraits of people, but photos were people were only a small part of the picture. The fish were even able to identify the presence of a person when that person was hiding behind a tree, with only their face showing, or when only part of a person's body was revealed in the picture. I'm not sure what was going on in these fishes' brains, but it appears to be more than just "food/not food" daydreams. Of course, during the

last thousand years over which koi were bred, food was most often associated with people, so maybe they have been selected for an ability to visually identify when humans are around.

Despite Manger's ideas that their large brains aren't used so much for thinking as for heating pads,[2] even skeptical scientists would likely assert that dolphins are smarter. But Manger's point is well taken – maybe there are some things that goldfish do better than dolphins – in that maybe goldfish would not get caught in tuna nets in the same way. Each species' intelligence has evolved over time to its particular environment(s). Compared to a dolphin, a human placed in the ocean could come across to a dolphin as quite stupid – not swimming properly, not avoiding sharks properly, and refusing to eat whole raw fish.

No one can say for certain how intelligent dolphins really are. Intelligence is quite a slippery concept. I know what makes me believe dolphins are intelligent, though – more than the scientific data, more than the research I did with dolphins -- the way a bow-riding wild dolphin once looked at me. I had no question; an intelligent being was on the other side of those eyes. And no scientist, or goldfish, has yet managed to convince me otherwise.

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7. Pests or People?

We asked the Taiji fishermen if we could subsidize this activity... in other words, if you leave the boats tied up at the dock, we'll pay you the same amount of money you would have made killing dolphins in Taiji. They got back to us and said "It's not about money. It's about pest control.

- Ric O'Barry in The Cove.

We affirm that all cetaceans as persons have the right to life, liberty and wellbeing.

- Declaration of Rights for Cetaceans, Helsinki, 2010

Dolphins have disappointed us. As a group, they are far from the angels we had hoped - rather criminals, having committed acts that we find not only morally reprehensible but, in some cases, personally threatening. Are the fishermen of Taiji, as reported by Ric O'Barry in The Cove, right in considering dolphins pests? Should any dolphin be killed on sight, much as some fishermen, because of the shark's general reputation as killers, kill any shark they see?

Can we continue to esteem the dolphin -- an animal that is known to bully and kill smaller related species, practices interspecies "bestiality," kidnaps and forces females to mate, and kills babies of its own species? What is it that dolphins have to offer that makes us willing to associate with such an animal?

To be fair, it should be pointed out that as far as we know, not all species of dolphin have been implicated in the list above; the most is known about bottlenose dolphins - and as a species they are implicated in all of the "'criminal" behaviors above. This could mean that bottlenose dolphins are particularly "bad," or that we haven't studied the other dolphin species enough to have observed these behaviors. Even so, little is known about how often even among bottlenose dolphins these behaviors occur. Research on any particular behavior - infanticide, for example - is still limited to just a few populations. No one knows for sure whether bottlenose infanticide occurs in just a few spots around the world, or whether it's widespread. So, it could be just a few dolphins in a few places around the world that are giving the rest a bad name.

Even with all the information now available about dolphin's violent and sexually aggressive tendencies, people clamor for their safety - indeed, some are making a case that dolphins should be considered non-human persons, with all the protection under the law that entails. In May of 2010, a group of scientists and activitis met in Helsinki to discuss this subject. Why do they feel dolphins are different and worth saving? With this in mind, I set up

Declaration of Rights for Cetaceans: Whales and Dolphins

Based on the principle of the equal treatment of all persons;

Recognizing that scientific research gives us deeper insights into the complexities of cetacean minds, societies and cultures;

Noting that the progressive development of international law manifests an entitlement to life by cetaceans;

We affirm that all cetaceans as persons have the right to life, liberty and wellbeing.

We conclude that:

1. Every individual cetacean has the right to life.
2. No cetacean should be held in captivity or servitude; be subject to cruel treatment; or be removed from their natural environment.
3. All cetaceans have the right to freedom of movement and residence within their natural environment.
4. No cetacean is the property of any State, corporation, human group or individual.
5. Cetaceans have the right to the protection of their natural environment.
6. Cetaceans have the right not to be subject to the disruption of their cultures.
7. The rights, freedoms and norms set forth in this Declaration should be protected under international and domestic law.
8. Cetaceans are entitled to an international order in which these rights, freedoms and norms can be fully realized.
9. No State, corporation, human group or individual should engage in any activity that undermines these rights, freedoms and norms.
10. Nothing in this Declaration shall prevent a State from enacting stricter provisions for the protection of cetacean rights.

Source: cetaceanrights.org[1]

a meeting with Dr. Thomas White, a professor of philosophy at Loyola Marymount University, and the author of In Defense of Dolphins, a book that argues that very case.

I met White in his office, reminded of the university's Catholic affiliation by the priest's collar worn by the man who offered directions on the way. White, a smiling, handsome man with a full head of beautiful white hair that would have made Mark Twain jealous, offered me a seat at a small round table. White then chose a seat eight feet away - unusually far away for an interview. I wondered if he'd chosen the farther seat because that chair was more comfortable or if the distance between us reflected wariness -- the wariness with which one would be well-advised to approach a strange dolphin until one is sure of its disposition toward humans.

In his book, White argues that dolphin intelligence, self-awareness and culture make them candidates for personhood. Rather than start negatively with a discussion of dolphin shortcomings, I started on a positive note. "What would happen," I asked, "if the argument in your book is successful? How would the world change?"

If this happened, if dolphins had the rights of non-human person, White told me, the killing of dolphins around the world would stop: "Everybody would recognize that the

deliberate killing of dolphins would be unacceptable … the slaughter in Taiji would stop. The slaughter in the Faroe Islands[1] would stop." Unintentional killing, also known as bycatch, the deaths that happen as a result of tuna boats capturing dolphins in their nets while fishing for tuna, would stop as well. White pointed out that bycatch alone is responsible for the deaths of an estimate 300,000 dolphins, whales and porpoises each year.[2]

Not just the killing of dolphins, would stop, but also the captivity of dolphins for entertainment purposes. "…when you look at the life of dolphins in the wild, … and the conditions that they need for their personalities to develop and to have a sort of emotional health, I don't see any way you can provide captive dolphins with those conditions, because you're regulating their social contacts the entire time," said White. In light of their new rights as non-human persons, White is clear that captivity is not a viable option.

Would there be any other implications, I asked, of

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[1] According to Wikipedia, the Faroe Islands natives had three hunts or "grinds" in 2009, resulting in the deaths of "310 pilot whales, 174 whitebeaked dolphins, 2 bottlenose whales and 1 bottlenose dolphin."

dolphins being recognized as non-human persons? Would we expect the dolphins to have more moral responsibility toward humans? White laughed, "Well, they already treat us pretty well. I mean, frankly, they treat us better than we treat them." He implied that humans sometimes had a part in negative dolphin interactions. And then he said it outright: "It [dolphin aggression against humans] can happen, but's infrequent, and I would suspect that a lot of times it's provoked by humans who don't understand what they're doing." Would he care to elaborate?

Have you heard of the incident of a woman escaping from a group of pilot whales? White asked. I had heard of it. But had I ever heard the <u>whole</u> story? I was sure I had not.

It two swimmers approached a group of pilot whales, one wanted to swim with the whales, and the other had a video camera. What the swimmers didn't realize, White told me, was that the whales were in the middle of having sex. "And so," White told me "they jump in the middle of everything, and break it up. And one of the pilot whales grabs the leg of the woman and pulls her down and then lets her go after an appropriate time, so that she goes back to the surface and all is well. But she of course tells it as an escape from the pilot whales." This seems like

aggressive behavior on the part of the whale, especially if you're the woman whose leg got grabbed. White explains, "… I am quite confident in saying that that's probably what they [pilot whales] do with their young to discipline them. …I have seen it in the Bahamas where a young dolphin really messes up, and you know, this isn't just kind of average discipline, this is they really mess up. We've seen the mothers hold the babies down, the young on the bottom for a while, as a way of 'You've really crossed the line, you need to know this is not okay.' It's discipline." So, from White's point of view, the pilot whale was not trying to hurt the woman, just teach her a lesson. White concluded, "So, I think there are lots of ways in which dolphins already treat humans better than humans treat dolphins." I'm sure former dolphin trainer Ric O'Barry of The Cove would heartily agree.

In 1994, humans treating a dolphin particularly "poorly" resulted in a human fatality. Tião, a dolphin who had six months earlier started socializing with human swimmers off the beaches of Brazil, was mobbed. According to reports, some 25-30 people approached him, some simply touched or grabbed at the dolphin's fins, others jumped on it and hit it. Some tried to stick foreign objects, including popsicle sticks, in its blowhole. During this

time some 29 swimmers received minor injuries. It wasn't until several swimmers, some drunk, got the idea of carrying him out onto the sand that Tião really went wild, seriously injuring one man, and fatally injuring another.[3] It's hard to fault a dolphin for reacting poorly when it's in danger of being stranded out of water - again a situation in which people not only didn't respect the dolphin as dangerous animal, they also weren't apparently aware of how it might view their actions.

Did White have a potential justification for other dolphin behaviors, such as infanticide?
White suggested that further necropsies might reveal that the infant had a condition that might make its future survival problematic. Could infanticide in dolphins be a form of mercy-killing?

He couldn't have an explanation for sexual coercion - but he did. "It could be because they're cultural beings, and cultures don't necessarily have a rational basis," White said. "And one of the things I think that is certainly possible when you're talking about beings with such a sophisticated affective life is affective pathology." He was suggesting that coercive dolphins might be crazy, at least temporarily. His other suggested explanation? Perhaps sexual coercion is "just a ritual kind

of behavior … atypical when you look at dolphin communities overall." White impressed me: he had really thought through accepted some of the most humanly-judged negative behaviors in dolphins and come up with potentially understandable explanations for them. "Since at any time, a bunch of females could take on the males and go equalize things, the fact that they don't … show[s] that there's another dimension to dolphin behavior." He didn't convince me his ideas were true - he convinced me that they were possible.

But suppose the worst case -- that dolphins do indeed have different values from us, and that some dolphins practice these behaviors on a regular, not pathological basis. Should dolphins as a species be decried? Lions practice infanticide - do we now consider them a pest species? Chimpanzee males are sometimes sexually coercive - do we expunge them from our family tree?

Perhaps we hold dolphins to an extremely high standard of behavior, one they can't live up to, because we feel they are in many ways our closest soulmates on this planet: intelligent, self-aware, and communicative. Perhaps the real question is not whether dolphins are a "dark" species, but whether humans are not.

If I had intercepted a recent declaration from a group of <u>dolphin</u> academics, it might read thus:

Humans are intriguing mammals; many suggest they have signs of intelligence and self-awareness. Indeed, we suggest the low frequency sounds they make may be part of their communication system, rather than a primitive form of echolocation. We have examined a number of their more inexplicable behaviors:

- *Capture and lifelong imprisonment of cetaceans and other species, apparently for entertainment purposes;*
- *Mass slaughter of cetaceans for unknown reasons (food?);*
- *Continued injury of cetaceans by boats that appear to be designed to capture;*
- *Pollution of the world's air and ocean without regard to other species; and*
- *Infanticide by females of their own offspring;*

Despite this litany of uncivilized acts, we wish to point out that no one has yet discovered why or how humans continue in these clearly maladaptive behaviors. Perhaps they are committed by a certain subsection that has affective pathologies. Some of us remain convinced that, despite the above, Homo sapiens, with its large brain, apparent self-awareness, and purported "language" abilities has redeeming qualities and should be preserved, even, perhaps, declared to have the rights of personhood.

Dolphins <u>are</u> intriguing animals - just not exactly the animals we want them to be. But that isn't necessarily a bad thing - it's just what is. In judging dolphin behavior harshly, we must also judge ourselves. I hope we're able to live up to at least some of their expectations.

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