# California Sport Divers
# Yahoo Review

## NOVEMBER 12TH 7 PM CLUB MEETING at LEE & PHYLLIS'!

Lee & Phyllis Thé
At the Clubhouse
777 San Antonio Road
Palo Alto, CA 94303 BYOB

## CLUB CALENDAR

| | |
|---|---|
| November 12 | CSD Meeting |
| November 14 | Bike Ride & BBQ |
| December 10 | CSD Meeting |
| January 10 | CSD Meeting |
| January 23 | CSD Beach Dive & Holiday Party in Monterey |

## MEETING MINUTES

The October meeting started with planning for the Stillwater Cove weekend, now in the past. It was done in conjunction with the Alameda Diners. In a first, John Diola will not be going as his abalone card got maxed out ahead of schedule. The limits now are split between Sonoma and Mendocino counties, and somehow his got filled in for the wrong area/month, making it impossible to take more this year. Phyllis & Lee will miss the Stillwater weekend too – they'll be diving in Cabo Pulmo.

We decided the holiday party will be at the Fishwife Restaurant in Pacific Grove on January 23rd.

Craig's brother gave him a "Big Blue" dive light; 1000 lumens of rechargeable lighting. There was also some other gear; it sounds like someone has given up diving.

Lee & Phyllis celebrated their 34th anniversary on October 9th. Be sure to ask if Lee got Phyllis any Opals to mark the occasion.

## DIVE REPORTS

Tom and Ben made a dive at Breakwater prior to Ben's Indonesia trip. It was very flat with no waves, and was 61 degrees at Breakwater with about 15 feet visibility. There are still lots of Sea Hares, piles of 7 or 8 of them, and at least one Rainbow Nudibranch. They also saw some unusual gobis there, including one with 2 black spots on the fin, and another that looked like it might be walking on the ventral finds in kind of a reddish color.

## ACTIVITIES

| | |
|---|---|
| October 23-25 | Stillwater Cove abalone weekend; low tide at 3pm |
| November 14 | Bike Ride & BBQ at Tom & Kathy's |
| January 23 | CSD Holiday Party in Monterey, with a beach dive if the weather permits. The party will be at the Fishwife Restaurant, 1996 Sunset Drive, Pacific Grove; it's in easy walking distance to the Pacific Garden Inn. Fishwife has a limited wine list, but corkage is only $10. |

Suggestions for Activities next year…

Segway at Angel Island
Academy Of Science Coral Reef Exhibit
Marine Mammal Center in Sausalito (cost $8.00)

**Entertainment**

Skip brought in some "Life on a Reef" DVD's, and we watched a few segments of those

## INTERESTING ITEMS…

# As Russia scopes undersea cables, a shadow of Cold War past

Thomas Gibbons-Neff
The Washington Post
Published: Monday, October 26, 2015, 12:57 p.m.

On Sunday, The New York Times reported that Russian submarines and spy ships are operating near vital undersea fiber-optic cables that transmit the majority of the planet's communication and economic data.

The fear, the report stipulates, is that Russia might be looking for weak spots that could be attacked and severed during a conflict.

Though the tactics and threat are reminiscent of the Cold War, the Russians appear to be taking a page out of the book that the U.S. Navy and the NSA wrote in the 1970s in a series of undersea wire-tapping missions that became known as Operation Ivy Bells.

Briefly mentioned in the Times report, Operation Ivy Bells is written about extensively in the book "Blind Man's Bluff: The Untold Story of American Submarine Espionage" by Sherry Sontag and Christopher Drew. The missions used submarines to listen in on previously untapped Soviet "hard-lines" to glean information about Soviet ballistic missile submarine deployments and strategy.

In 1970, at the height of the Cold War, James Bradley, the director of undersea warfare at the Office of Naval intelligence dreamed up one of the most daring submarine spy missions in modern history. He wanted to send the specially outfitted 350ft nuclear-powered submarine, the Halibut, to land over the ocean floor under the Sea of Okhotsk and tap a phone line that connected the Soviet submarine base at Petropavlovsk to its Pacific Fleet headquarters near Vladivostok.

Besides the risk of international incident if Halibut was caught or detected, there was no evidence that the phone line even existed. The only evidence that Bradley had was the notion that the sub base in Petropavlovsk was probably required to give constant updates back to its higher headquarters. So Bradley, sitting in his Pentagon office at 3 a.m., thought back to his childhood, racking his brain to figure out where the Soviets might have laid their cables.

According to "Blind Man's Bluff," Bradley, in his predawn stupor, recalled from his youth written signs that had been posted along the Mississippi River to mark undersea cables. The signs, posted along the shore, were meant to prevent passing from hooking the cables with their anchors.

With this in mind, Bradley reasoned that there had to be similar signs near the shallower points on the Sea of Okhotsk.

So, with Bradley's childhood in mind, "the most daring acts of tele-piracy of the Cold War" was born.

After an extensive multi-year refit that began in the late 60s, Halibut was ready to depart from Mare Island Naval Shipyard outside of San Francisco for Okhotsk in 1972. One of the sub's most noticeable additions was a giant hump mounted behind its conning tower, a hump that was publicly declared as a hangar for a deep sea rescue vehicle but was actually a "decompression and lockout chamber" for the team of divers that would exit the sub to tap the Soviet cables.

So in October 1972, the crew of Halibut made its way across the Pacific, its older nuclear reactor pushing her across the sea at just over 10 knots. First the spy sub moved north to the Aleutian Islands, then past the Bering Straight and into the Sea of Okhotsk. The captain of the Halibut, Navy Cmdr. Jack McNish, had not told the crew where it was going-only that they were leaving home for three months and that they were searching for the remnants of a new Soviet infared anti-ship missile that the United States was desperately seeking a counter-measure for.

Once inside the Sea of Okhotsk, the Halibut slowly patrolled with its periscope up, scanning the coastline for Bradley's signage that would mark the cables. And then, after a week of patrolling with no luck, the Halibut found a sign on the northern shore of the Sea of Okhotsk that said something to the extent of "Do Not Anchor. Cable Here" in Russian.

The Halibut, after locating the sign, launched a specially designed submersible or "fish," that then proceeded to search for the cables. The fish had a very basic video camera, and a higher definition camera. While the video was relayed in real-time back to the submarine, the film from the camera had to be retrieved from the fish and subsequently developed while the Halibut was near the surface so that the sub's dark room could properly vent or "snorkel" the chemicals used to develop the film.

Hours after the fish's launch, footage began to come back of foot-long bumps in the sand, a sort of Morse code etched in the sea bottom. The Halibut had found the cables.

According to "Blind Man's Bluff," the fish was then retrieved and the film developed, revealing the Soviet cables strewn along the seafloor.

After identifying the cables, McNish maneuvered the Halibut well outside the 3-mile territorial limit of the Soviet Union and located a spot just above the cable where he could lower the submarine's two massive anchors in a sort-of hover.

Using specially designed rubber wet suits that fit loosely and were pumped full of hot water to counter the freezing temperatures of the Sea of Okhotsk, the divers departed the Halibut armed with pneumatic air-guns to blow debris off the cables and emergency oxygen bottles in case their "umbilical cords" that connected them back to the Halibut were severed.

The wire-tap, according to "Blind Man's Bluff," was three-feet long and composed of a tape recorder and a lithium ion battery. A connector would wrap around the cable and draw out the words and data through induction. There was no cutting into the cable.

For the next few hours the recording device attached to the cable relayed Soviet communications back to a select group of spies aboard the Halibut who would then, after the completion of the mission and a successful return to port, send the tapes to Fort Meade, Md, where they would be subsequently analyzed.

With the tap successful, the Halibut then moved to its secondary mission of locating the Soviet missile fragments before returning to port. With the mission a success, Bradley saw a future filled with taps around the globe that could record for months and years continuously, without the presence of an American sub to collect the data.

In August 1972, the Halibut departed once more for the Sea Okhotsk to repeat the tap. This time, however, the sub was rigged with explosives in case the sub and her crew were ever compromised. This time too, according to Blind Man's Bluff, McNish told his crew about their actual mission and the risks it entailed.

In the years following more submarines would be outfitted like Halibut, and they too would conduct similar wire-taps. Operation Ivy Bells had begun.

http://www.heraldnet.com/article/20151026/NEWS02/151029229

Fibers and microplastics make their way into our food system. Photo: Daniel Bowman

# California's Fish Are Ingesting Tiny Fibers from Your Favorite Jacket

New study finds that fish are ingesting large quantities of fibers that likely came off your outerwear in the wash and flowed into the sea.

By: Mary Catherine O'Connor
Nov 3, 2015

Humanity dumps 8 million tons of plastic into the oceans each year, according to a study published early this year in *Science*. That's a mind-blowingly large figure, but it still doesn't account for the untold billions of tiny plastic fibers from synthetic apparel that leave your washing machine and enter rivers, lakes, and oceans through wastewater treatment plants.

These fibers, as well as tiny bits of degraded trash and microbeads from

personal care products, have generated a long list of questions and concerns among environmental scientists. In a new study in *Nature*, Chelsea Rochman, a marine ecotoxicologist from the University of California, Davis, addressed one of the chief concerns: Are those fibers and other microplastics getting into our food system? The answer: Yes.

To reach this conclusion, Rochman and her colleagues purchased and dissected fish and bivalves from markets near Half Moon Bay, California, and compared their contents to those of fish and bivalves purchased from a market in Makassar, Indonesia. In both locations, more than half of the species and roughly a third of the individual fish and shellfish contained foreign objects—most of which were microplastics—that the fish and shellfish filtered from the water or mistook for food. But while none of the debris collected from the Indonesian samples were fibers, the researchers concluded that the majority of debris collected from fish and shellfish caught along the California coast were fibers from textiles. (The study did not distinguish between cotton and synthetic fibers, the latter of which are so prevalent in outdoor performance wear.)

"We were shocked" that none of the fish or shellfish from Indonesia contained fibers, says Rochman. She was not

surprised, however, that the majority of debris in samples from California were fibers, since wastewater effluent from communities up and down the coast ends up in coastal waters and carries with it tiny fibers that evade filtration systems. The area in Indonesia from which the researchers purchased fish and shellfish, on the other hand, lacks that kind of wastewater treatment infrastructure, she says.

"Plus," she adds, "don't forget that washing machines are a luxury we take for granted." People in undeveloped parts of Indonesia likely hand-wash their clothes outside.

Environmental scientists first raised concerns about these microfibers following a microplastics study published by British ecologist Anthony Browne in 2011. Browne found a preponderance of tiny polyester and acrylic fibers in beach sediment near wastewater treatment plants. More recently, researchers analyzed wastewater treatment effluent headed into the Great Lakes and found 85 percent of the microplastics it contained were fibers.

The results of Rochman's study further incriminate apparel as a source of ocean pollution.

Yet researchers still don't know whether humans are at risk from ingesting microfibers, many of which scientists suspect are plastic. And if we are, to what degree? (It's also worth noting that

shellfish and small fish eaten whole, such as sardines, are the main ways humans will ingest the plastic debris, since in larger fish it settles in organs that are removed before consumption.) Past studies have shown that microplastics do absorb toxins such as DDT and PCB from waterways, so when we eat fish that contain fibers, there's at least the potential for chemical harm. Studies have also shown that microplastics harm lugworms and small organisms and that they can accumulate in fish's guts and tissues, potentially weakening immune or endocrine systems.

Even though more fibers were found in California's fish, Rochman makes clear that Indonesian consumers are still facing a more vexing public health problem. "We found more plastic, overall, in Indonesia, and seafood is their main protein source, whereas it's not for people in U.S.," she explains.

Studies showing high quantities of synthetic microfibers in wastewater effluent and the unanswered questions around what harm they are doing to the ecosystem and public health has spurred the outdoor apparel industry to look inward. In our August issue, we broke news that Patagonia has launched a project with the Bren School of Environmental Science and Management at the University of California, Santa Barbara to identify which synthetic materials

in its supply chain shed fibers. Adam Fetcher*, communications director at Patagonia, says research is still ongoing, but he's confident the company will have findings to share by spring.

The Outdoor Industry Association (OIA) convened an industry task force dedicated to microfibers and ocean plastics and is working with its members, including Patagonia, and environmental groups such as Adventurers and Scientists for Conservation, to "better understand our impact and leverage points as an industry," says Nikki Hodgson, corporate responsibility coordinator for the OIA.

In Europe, the European Commission funded research by the Italian National Research Council's Institute of Polymers, Composites, and Biomaterials, which is also midstream. So far, says project lead Maurizio Avella, the project has surveyed 830 European households about the fabrics they wear and performed some baseline tests on a range of fabric types. The survey showed that about a quarter of all respondents' apparel items are fully synthetic, with cotton-synthetic blends comprising 15 percent, and items made completely or mostly of natural fibers accounting for the remainder.

Yet most respondents said they wash all of their clothes using cycles designed for cotton, which exerts more centrifugal force than is actually needed to clean synthetic fabrics. Plus, the

research has found that powder-based, high-pH detergents, oxidizers, and washing in hard, high-temperature water all contribute to high fiber loss from the apparel being laundered.

One potential solution would be to capture the tiny fibers before they go down the drain, but the appliance industry has yet to make any substantive steps toward researching the feasibility of integrating additional filters to washing machines to collect fibers (though some aftermarket retrofits, designed for keeping lint out of septic tanks, are available). Jill Notini, spokesperson for the Association of Home Appliance Manufacturers, says the group is convening a technical group to discuss the issue.

Meanwhile, citizen scientists are also trying to aid microfiber research. Last month, Adventurers and Scientists for Conservation launched a multiyear research project to analyze water samples in Montana's Gallatin River watershed in an attempt to quantify the inflow of synthetic fibers and other plastics into the water system close to their source. Rochman plans to continue her analysis as well. "I'd love to collect fish from all over world and analyze the chemicals in them," she says.

http://www.outsideonline.com/2032231/californias-fish-are-ingesting-tiny-fibers-your-favorite-jacket

# Push or pull? Science was wrong on jellyfish motion

By Laurence Coustal | AFP – Tue, Nov 3, 2015

- AFP/AFP/File - Rather than propelling themselves by pushing water rearward, jellyfish and lampreys -- a species of snake-like, jawless fish also known as lamprey eels -- "pull" themselves forward by creating a region of low pressure in the water ahead of them

For the longest time, science has assumed that in order to run, swim, or fly, animals and humans must exert pressure on the ground, water or air around them to project themselves forward.

But a study of jellyfish and eels published Tuesday says the premise is false -- at least when it comes to certain swimming animals.

Rather than propelling themselves by pushing water rearward, jellyfish and lampreys -- a species of snake-

like, jawless fish also known as lamprey eels -- "pull" themselves forward by creating a region of low pressure in the water directly ahead of them.
"The low pressure is created on the 'top' of the jellyfish's umbrella-shaped body, which is different from our previous understanding of their swimming dynamics that focused on the flow underneath the umbrella," study co-author John Dabiri of the University of Stanford told AFP.
"By measuring for the first time the pressure that swimming animals exert on the surrounding water, we have shown that the mechanism of efficient swimming is much different from conventional wisdom."
The finding, published in the journal Nature Communications, holds promise for designing much more energy-efficient submarines.
To date, said Dabiri, the focus in biomechanics and engineering studies has been on creating high pressure for propulsion, rather than low pressure.
"If the suction-based mechanism observed in animals can be translated to engineered vehicles, it could provide significant energy savings."
High pressure is generated by pushing liquid molecules together, through a sideways body motion for the lamprey, or by pushing water with his hands for a swimmer.
Low pressure can be created in various ways -- most commonly by rotating the body to create swirling vortices with low-pressure areas at their centre, said Dabiri.
This mechanism requires less energy to create propulsion than the high-pressure alternative, he added.
- Evolutionary assumptions -
Dabiri, an engineer, and a team of biologists made a close study of the motion of jellyfish and lampreys.
They studied them swimming through tunnels of water seeded with tiny glass beads to make the motion of the surrounding liquid easily visible. They used high-speed digital imagery to record "flow fields" around the fish, combined with computerised pressure measurements.
The team found that low-pressure regions dominated the

balance of forces in the water around the fish.
The discovery could change some fundamental assumptions about animal evolution, said Dabiri.
"Animal motility is known to be important for determining the fitness of species and hence their capacity for survival," he explained.
"Prior to this work, the assumption... had been that generating high pressure is essential for achieving effective motility," and was thus a desired evolutionary adaptation.
Now it turns out that animals may have evolved for low-pressure designs instead.
Jellyfish and lampreys have among the most energy-efficient swimming motions of any animal.

https://uk.news.yahoo.com/push-pull-science-wrong-jellyfish-motion-164810415.html#tmrSa5Q

NOVEMBER 05, 2015

# How some fish can supercharge their vision

SCIENCE WILDLIFE PHILADELPHIA REUTERS FISH

BY **WILL DUNHAM**

*DAVID GRAY/REUTERS*

Tasmanian salmon swim in a pond, which can hold up to 40,000 fish, during a daily inspection of the nets at a Tasmanian salmon farm owned by Huon Aquaculture Group Ltd located at Hideaway Bay, south of Hobart in this June 2, 2014, file photo. REUTERS/David Gray/Files

WASHINGTON - Superman can use his X-ray vision whenever the need arises. It turns out that in real life, some fish and amphibians can do something nearly as super when it come to their sight.

Researchers on Thursday said these animals, when navigating murky freshwater environments like rivers and streams, can turn on an enzyme in their eyes that supercharges their ability to see infrared light, sharpening their vision in the muck and mire.

The enzyme, called Cyp27c1, is related to vitamin A, which was already known to promote good vision, particularly in low light.

Vitamin A is a critical component of the visual pigment in eyes that facilitates sight. With the enzyme, fish and amphibians can tune their vision to match the environmental light.

Chemically, Cyp27c1 makes a small modification on the molecule of the form of Vitamin A called Vitamin A1 to turn it into Vitamin A2, shifting sensitivity of eye photoreceptors to longer wavelengths such as red and infrared light.

This explains how freshwater fish like salmon can smoothly adjust their vision as they exit ocean waters, where the light environment is blue-green, and enter inland waterways, where the light environment veers to the red and infrared end of the spectrum.

This ability is also valuable for amphibians that switch from vision on land to underwater.

"Fresh water tends to be

more turbid or murkier than these other environments. This murkiness filters out shorter wavelengths of light - blue, greens, and yellows – leaving mainly longer wavelengths – red and infrared light," said pathologist and vision scientist Dr. Joseph Corbo of Washington University School of Medicine in St. Louis.

"We don't know when in the course of evolution the Cyp27c1 enzyme first acquired the function it has today," Corbo said. "However, the fact that the same enzyme is used by both fish and amphibians suggests that this function originated hundreds of millions of years ago."

The researchers first pinpointed the enzyme in a common laboratory fish called the zebrafish, then found it in bullfrogs. Humans possess a copy of the gene that controls this enzyme, but it is not active in our eyes.

Corbo said the enzyme possibly could be used in conjunction with optogenetic devices, which allow scientists to turn the activity of neurons on and off with light, in a new approach to treat neurological and blinding diseases.

The research was published in the journal Current Biology.

http://www.phillyvoice.com/how-some-fish-can-supercharge-the/