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SWIMMING WITH SHARKS

by Margery Facklam

Sunlight sparkled on bright blue-green water as a small boat dropped anchor. Three divers wearing black wet suits adjusted their scuba gear. One diver leaned over the side of the boat and peered into the water. It was so clear he could see the rainbow assortment of fish swimming around the coral reef.[1]

"Sharks below," he called.

"No problem," a second diver answered calmly. "Use this," she said, handing cans of shark repellent to the others.

When they had sprayed themselves all over with the repellent, the divers put on their masks and flipped backward out of the boat into the warm water. Two tiger sharks began to circle the divers. Silently they picked up speed to attack, but as they closed in on the swimmers, they slammed on invisible brakes. Suddenly their mouths seemed to be frozen open. They shook their heads as though trying to get rid of something. And the divers went about exploring the coral reef, unconcerned about the sharks.

So far, that scene is only make-believe. There is no shark repellent that really keeps sharks away, but there may be soon because Dr. Eugenie Clark was curious about a little fish called the Moses sole.

In 1960, Eugenie was netting fish in the Red Sea when she came across the flatfish known scientifically as Pardachirus; local fishermen called it the Moses sole. When she touched the fish, a milky substance oozed from the pores along its fins. It was slippery, and her fingers felt tingly and tight, the way they might feel if they fell asleep.

Eugenie is an ichthyologist, a scientist who studies fish. She was working at the Marine Laboratory at the Hebrew University in Elat, Israel, when she decided to find out more about the sole's poison. A scientist had reported the poisonous substance in 1871, but no one had studied it further.

[1]**coral reef:** a ridge near the surface of the water made of countless skeletons of tiny ocean animals

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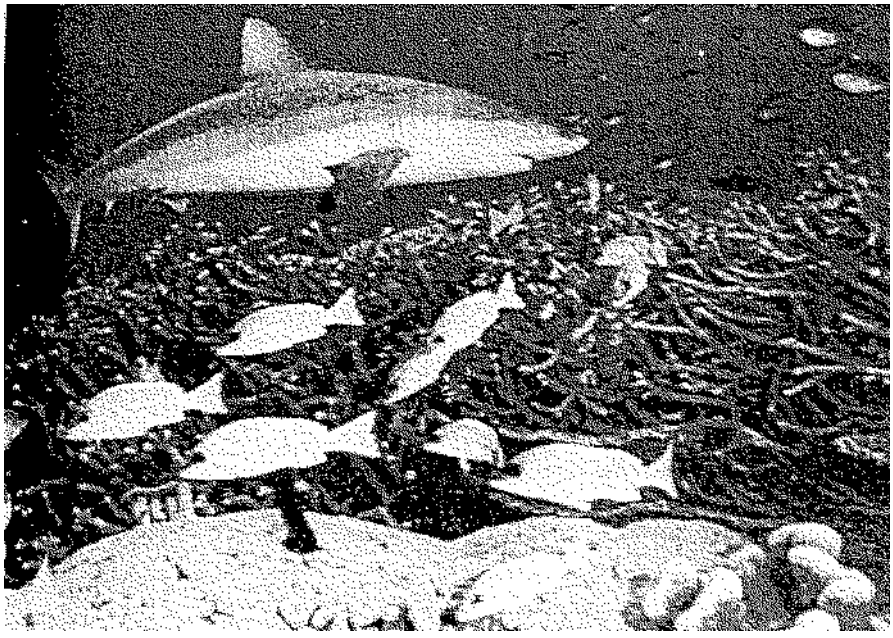
When Eugenie tested it on sea urchins, starfish, and reef fish, she found that small doses killed these creatures quickly. She began to wonder how it would work on larger fish, especially sharks.

Three reef whitetip sharks lived in a tank at the laboratory, and they ate anything dropped into the water. One day as Eugenie was experimenting with the fish, she found one small Moses sole that had not been completely "milked" of its poison. She put a string through its gills, which did not hurt it, and lowered the fish into the shark's tank. The moment the sole touched the water, the sharks swept toward it with mouths open wide. But when they got within a few feet of the fish on the string, the sharks' jaws seemed to be frozen open. They dashed away, shaking their heads as though trying to get rid of something awfiil. For six hours Eugenie watched the sharks approach the sole, and the reactions were the same each time the sharks swam near the poisonous fish.

The use of this poison as a shark repellent was an exciting idea. So far everything invented to keep sharks away had not worked on all sharks all the time. Streams of air bubbles used as a barrier along beaches eventually attracted sharks, who seemed to enjoy the feeling of the bubbles as they swam through them. Different dyes that swimmers can release in the water only hide the swimmer from the shark temporarily but cannot keep a really hungry shark away. Lifeboats on ships and Navy planes are sometimes equipped with plastic bags large enough to hold a person. Stranded in the water, the person inflates the top ring and crawls into the tubelike bag. A shark cannot follow the scent of a human inside this bag, nor can it see kicking legs or blood from a wound. But such bags are not carried as regular equipment by swimmers at an ocean beach. A substance that can be sprayed on, the way mosquito repellent is, would be perfect.

But before Eugenie could experiment further on the Moses sole, she had to leave the Elat laboratory, and other work claimed her attention for many years. It wasn't until 1974 that she was able to collect some of the fish and test the sharkstopping poison. After dozens of experiments in tanks and in the sea, a final test was arranged to iind out how free-swimming sharks reacted to the live Moses sole.



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An eighty-foot shark line, with ten shorter lines dropping from it, was stretched close to the rocky Israeli coastline three feet underwater at a point where a ledge dropped off to a depth of one thousand feet. Each of the ten dropper lines was baited with parrot fish, groupers, nonpoisonous flatfish, and the Moses sole. As Eugenie, her fourteen-year-old son, and other assistants snorkeled[2] quietly along the underwater ledge and watched the sharks approach the bait at dawn or sunset, they saw the poison at work.

One by one, the fish were gulped down by hungry sharks, but the Moses sole remained untouched. When Eugenie wiped the skin of a Moses sole with alcohol to remove the poison and tossed the fish into the water, a shark would instantly eat it. It was an exciting discovery—a substance that could really stop a shark. Further work is being done now to make a chemical compound like the poison of the Moses sole that can be used as a reliable commercial shark repellent.

[2]**snorkeled:** swam underwater using a snorkel, or breathing tube, that extends above the surface of the water

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