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SCIENTIST AT WORK -- Alfred McLaren; Explorer of Arctic Depths Plans Another Trip North

By WILLIAM J. BROAD

Dr. Alfred S. McLaren has probably spent more time than anyone else in the twilight zone beneath the earth's northern ice, measuring its thickness, probing dark waters below, investigating its life and mapping the plains, crags and fissures of its seabed.

He has cut through ice-covered waters that few have seen, opening a hidden world.

Now, at 70, he is happily making plans to go back.

"I can't let these years slow me down," said Dr. McLaren, a polar bear of a man with a receding mane of white hair. "Knock on wood; I'm picking up a head of steam."

The Arctic Ocean is six times as large as the Mediterranean. Its depths are among the most mysterious of the oceans, mainly because its ice, averaging 10 feet thick, is an insurmountable barrier to most traditional methods of ocean research.

But Dr. McLaren, a retired Navy submariner, explored it on three expeditions, the last as commander of his own sub.

As a naval officer, he photographed polar animals from his periscope and then surfaced to play baseball with the crew. In 1960, the pitcher's mound was the North Pole itself.

"If you hit a home run, you'd circumnavigate the globe," he recalled.

After retiring from the Navy in 1981, he earned a Ph.D. in polar studies from the University of Colorado and focused his research on the Arctic's role in climate change.

Since then, Dr. McLaren has gone on a whirlwind tour of the deep ocean. He often dives with the Russians, his cold war adversaries. He has studied dark ecosystems teeming with life and made the first human dives on the Bismarck, the German battleship that sank in the early days of World War II.

Recently at the Explorers Club, where he is president emeritus, Dr. McLaren showed high-definition videotapes of his dives, to the oohs and aahs of a distinguished audience of oceanographers and vagabonds.

At the Rainbow Vents, more than a mile down in the Atlantic, the expedition camera zoomed in on millions of shrimp as they swarmed around volcanic hot springs, the view at times close enough to reveal their thrashing legs and tails.

"Nobody's ever seen this before," Dr. McLaren told the audience.

What sets his heart racing, though, is the thought of getting back into freezing waters. In April, he is to help lead an expedition to Canada's northern isles and seas, diving through the ice in a tiny two-man submersible.

His ultimate goal is to become the first person to dive to the seabed beneath the North Pole and explore a nearby ridge that bears hints of hidden volcanic fire -- and, perhaps, lush ecosystems.

"There isn't anything like it," he said, adding that the venture, now set for 2004, is too far off for his taste. Potential collaborators have signed up, only to equivocate, keeping him in a state of hopeful agitation.

As Dr. McLaren lines up financing and participants, he is working on two books about his life. The first centers on his explorations of the Siberian continental shelf, an icy underwater expanse off the northern coast of Russia. The second is a wider look at his life as a cold-war submariner.

Parts of that story, including how he won the Distinguished Service Medal in 1972, will remain unwritten for reasons of national security.

"We had sensational years conducting special ops," was all he would say.

Alfred Scott McLaren was born on Aug. 9, 1932, at Lake Arrowhead, Calif., in the mountains northeast of Los Angeles, a ninth-generation Californian and the eldest of six children. At his father's ranch, he rode horses, shot rifles and explored Indian caves. Later, his mother remarried, wedding a Navy man.

Dr. McLaren, too, went to sea, graduating in 1955 from the Naval Academy and, in time, becoming among the first 100 officers selected by Adm. Hyman G. Rickover to attend the Nuclear Power School.

The young officer's first encounter with the northern wilds occurred in 1960 on the nuclear submarine Seadragon. In Baffin Bay, west of Greenland, Dr. McLaren and the crew investigated how far down icebergs extended and discovered that when melting they make a hissing noise as gas bubbles are set free, like a freshly opened can of soda.

"You could hear it 70 miles away," he recalled, suggesting that understanding Arctic noise played an important role in the Navy's hide-and-seek tactics with enemy forces.

The Seadragon's nets caught small drifting sea life, and its underwater camera captured the ways of fish, seals and killer whales.

"It got so good," Dr. McLaren said, "that nobody watched movies."

On the voyage, the sub made the first submerged survey of the Northwest Passage, the water route from the Atlantic to the Pacific through Canada's Arctic islands, discovering in the process that charts were so faulty that some isles were up to seven miles out of place.

After that voyage, Dr. McLaren rode a wave of high technology at sea as the Navy built a new class of 37 submarines especially adapted to operate under the ice. Known as Sturgeons, the subs had upward-looking sonars to map the polar ice's jagged underside and reinforced sails and rudders that allowed them to break thin ice and surface.

When he earned a master's in international affairs from George Washington University in 1968, his thesis was on the military importance of marginal sea-ice zones, areas that ice over only in winter. In 1969, he was given command of the Queenfish, a Sturgeon sub that he had served on earlier.

A voyage in 1970 set the stage for much of Dr. McLaren's ensuing scientific research. After surveying previously uncharted areas of the Arctic Basin and nearby continental shelves, the Queenfish sailed for the North Pole along the same route that the Nautilus, the first nuclear sub, took in 1958, and did so at exactly the same time of year.

Dr. McLaren had long lobbied for the trip, arguing that it could gather important data to help determine whether global warming was real.

On the voyage, the sub took careful measurements all the way. But in a first, it also secretly surveyed the Siberian continental shelf, including the Laptev, East Siberian and Chukchi Seas.

"These were totally uncharted waters," he recounted. "Nobody had any idea what to expect."

One day, after taking the sub near the surface in a watery gap and peering around through the periscope, Dr. McLaren was startled to see a large polar bear on the nearby ice. Suddenly, it plunged into the water and swam directly for the periscope.

"The cross hairs are on her nose," he recalled. "And I'm thinking, 'How am I going to explain teeth marks on my periscope when I get back to port?'"

The bear sniffed at the periscope and turned away, two cubs in tow.

A major find of the Queenfish voyage was deep gouges in the Siberian continental shelf, apparently cut by glaciers in the last Ice Age. The mission also detected mysterious and previously unheard noises emanating from the Gakkel Ridge, a mountainous spine that runs 1,100 miles down the Arctic Basin near the North Pole. The noises suggested seismic activity, even volcanism, far under the ice.

From 1978 to 1980, Dr. McLaren was commander the Naval Underwater Systems Center, a major research laboratory in Newport, R.I., that employs 3,200 scientists and engineers.

After retiring from the Navy as a captain, he conducted doctoral research at the University of Colorado on the comparative ice readings of the Nautilus and Queenfish. In the 12 years between the voyages, he found, the Arctic ice had thinned by an average of 28 inches.

After graduating in 1986, he was financed by a number of federal agencies to examine what more could be learned from the analysis of submarine ice-thickness data.

Climate models predict that the Arctic will be among the first regions to respond to a global warming trend. Dr. McLaren was cautious, though, saying it was unclear whether the changes were a result of natural cycles or human-induced warming.

"More data are required before one can hope to discern overall trends with any confidence," he wrote in 1990 in the journal *Nature*, a view he still holds.

Since then, he headed Science Service Inc., an organization in Washington that publishes *Science News*, the weekly magazine. From 1996 to 2000, he headed the Explorers Club, founded in 1904 to promote scientific exploration.

Recently, Dr. McLaren has probed the deep sea. His two dives to the *Bismarck*, this year and last, took him down nearly three miles.

In April, he is to help lead an expedition off Beechey Island in the Northwest Passage, on Resolute Bay. Boarding a tiny submersible, he is to explore the northernmost known shipwreck in the world, the *H.M.S. Breadalbane*, a British barque lost in 1853. The ship sits upright on the bottom, 350 feet down, its hull, masts and sails preserved by the icy water.

Dr. McLaren is most excited by his prospective dive 1,000 miles north, to the North Pole and the Gakkel Ridge, the site that caught his attention 30 years ago.

"It's a strange area," he said, and the chance to see it with his own eyes would be "the realization of a dream."

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Space could solve water problems Have you ever tasted saltwater? I guess you have and if so, you will agree with me that it's not very refreshing. In fact, drinking more than a few cups worth can kill you. According to the United States Geological Survey, whose mission is to collect and disseminate reliable, impartial, and timely information that is needed to understand the nation's water resources, about ninety-seven percent of the water on our planet is saltwater; the rest is stored in lakes, rivers, glaciers and aquifers underground. We collect the water and pass an electric current through it from a solar panel. The water separates into oxygen and hydrogen, which in liquid form is a powerful rocket fuel. Is this really possible? We may soon find out.