

Keeping Jacques Cousteau's Flame Alive

The new scientific director of The Cousteau Society, an expert on coral reefs, is picking up where the great explorer left off

A half-century ago Jacques Cousteau enthralled the world with his Oscar-winning documentary *The Silent World*, a paean to the Red Sea and its stunning coral reefs. Few scientists would have the temerity to follow in the legendary naturalist's footsteps, and fewer still the credentials to do so. But in a voyage that ended last March, marine biologist Jean Jaubert and his crew retraced Cousteau's path from Monaco to the coasts of Sudan and Eritrea, gathering data on how the Red Sea's reefs have fared in the 5 decades since the celebrity in the red skullcap brought them to worldwide fame.

As the new scientific director of The Cousteau Society (TCS), Jaubert, 63, is bringing his own derring-do on the high seas to craft science-based documentaries that, he and the society hope, will cast a Cousteau-esque spell on a new generation of viewers. The Red Sea voyage marks a return to the seas for TCS, which has struggled since Cousteau's death from a heart attack in 1997.

"Jean is a charismatic expedition leader and utterly fearless," says Peter Mumby, a marine biologist at the University of Exeter, U.K. Those attributes should serve Jaubert well as he continues Cousteau's voyages.

An undersea life

Jaubert's fascination with the underwater world began in the 1940s, during a childhood spent in a town on Algeria's Mediterranean coast. His uncle would bring home early black-and-white Cousteau films and, later, snorkeling equipment that was hard to

come by. Even at age 12, Jaubert says, "I knew that I wanted to become a marine biologist." This curiosity blossomed into a passion for aquariums, which he'd build from scratch at home.

After obtaining degrees from the universities of Poitiers and Marseille in France, Jaubert set up shop at the University of Nice. But he hardly settled



Diving in. Jean Jaubert is raising funds for a string of expeditions.

down. In 1974–75 he and two other scientists lived for a month in a "Hydrolab" nestled among reefs on the sea floor 20 meters under the Atlantic off the Bahamas. The high-profile experiment was designed to complement research on space travel. "The habitat was very small and all of our food was freeze-dried, like in a space lab," recalls Jaubert fondly. The experiment

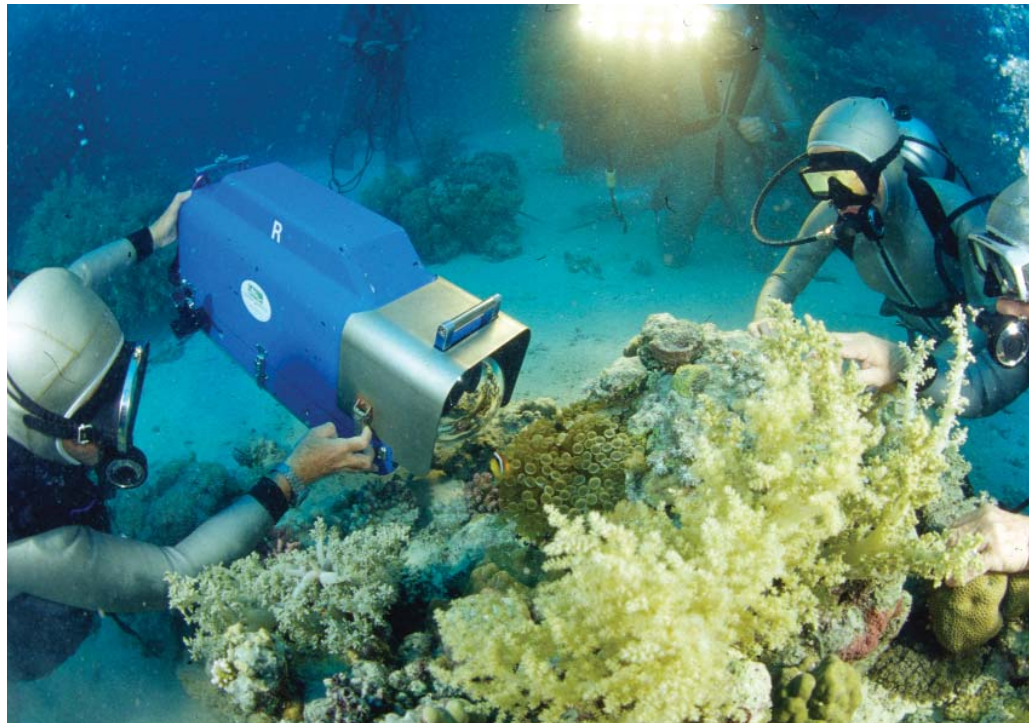
proved that it was possible to live undersea, and dive freely at depth, for extended periods, with a radio link as the only connection to the world on land.

Jaubert's seminal achievement may be the development of techniques for maintaining humanmade coral reefs, methods that have been adopted by aquariums and laboratories throughout the world. His system employs anaerobic bacteria in a sandy substrate to filter out nitrates that inhibit coral growth. The technique enabled Jaubert's group to cultivate coral in the lab and carry out detailed analyses of coral physiology. His group discovered in the 1990s that reefs help transfer carbon dioxide from the water column to the atmosphere, and that rising CO₂ levels, together with warming water temperatures, have led to an erosion of many tropical reefs. "Jean has been a key researcher in our attempt to understand how coral reefs may play a role in climate change," says Ove Hoegh-Guldberg, director of the Centre for Marine Studies at the University of Queensland in Australia.

Jaubert became a gifted evangelist on reef protection, even persuading Prince Rainier III of Monaco that corals are an important indicator of ocean health. In 1990 the prince gave Jaubert his blessing to set up and host the European Oceanographic Center at Monaco's Oceanographic Museum, tasked with uncovering the causes behind degradation of reefs and other marine ecosystems. (Last month Jaubert was appointed the museum's director in addition to his TCS post.) Financial support for the center came from the principality of Monaco and

the Council of Europe. "I was convinced that global changes in the biosphere were partly responsible for coral death, and that complementary experiments in the field and lab were needed to understand its causes and mechanisms," Jaubert says.

Jaubert's darkest days, he says, were after he and several colleagues at the museum were accused in 1997 of the acci-



Following in Cousteau's footsteps. Jaubert sailed in the society's ship *Alcyone* to the Red Sea reefs Cousteau made famous.

dental release of a highly invasive aquarium strain of an Australian seaweed, *Caulerpa taxifolia*, into Monaco's waters. Dubbed "killer algae," the seaweed has been blamed for displacing native species on several continents and continues to spread unimpeded across the Mediterranean. Jaubert denies that his lab had anything to do with the introduction of the species; in 1998, and again in 2000 and 2001, French courts awarded him damages for defamation.

Aqua-gallivanting

He may need such resolve in the face of adversity as he takes on the daunting challenge of assuming Jacques Cousteau's mantle. In 1943 Cousteau invented the aqualung, bringing scuba diving to the masses. His vessel, the *Calypso*, traversed over 1.5 million kilometers of seas and waterways, from the Nile River to Lake Baikal. Along the way, Cousteau produced 144 films and documentaries, including *The Silent World* (1956) and *World Without Sun* (1964), the first color film of marine life. The episodes of his 1960s and '70s U.S. television series, *The Undersea World of Jacques Cousteau*, "were nothing less than spectacular," says Leonard Muscatine, a marine physiologist at the University of California, Los Angeles. "They did the sort of thing that lab- and field-bound biologists never had the ability to do, because they didn't have the mobility or the time." Cousteau's adventures are

credited with drawing public attention to overfishing, pollution, and other woes.

In 1974, Cousteau founded TCS, now a Hampton, Virginia-based nonprofit, as his logistical base and as an advocacy group for environmental issues. Funded through donations and membership fees, TCS was instrumental in persuading governments to ratify a 1991 protocol to the Antarctic Treaty prohibiting mining on the continent for 50 years. TCS, headed by Cousteau's widow, Francine, is now pressing governments to create a United Nations International Court for the Environment.

Cousteau's death cast a pall over the society's expeditions that has been hard to dispel. Peter Blake, a celebrated sailor and a friend of Cousteau, was appointed head of expeditions, but his focus was on preparing for the America's Cup, a sailing competition he would go on to win in 2000. Tragedy struck in December 2001, when thieves crept aboard Blake's schooner in the mouth of the Amazon River and shot him dead when he pulled out a rifle to defend his crew.

After a hiatus, Jaubert was appointed the society's scientific director last October. Colleagues say he has Cousteau's intrepid streak. "I remember Jean plumbing the depths of Rangiroa Atoll to record the extent of coral bleaching in 1998. Most of us were content with a dive to around 30 meters, but Jean disappeared beneath us. He probably set a new record for the deepest observation of coral bleaching," Mumby says.

Jaubert has wasted no time at TCS, set-

ting sail from Monaco for the Red Sea last November on the society's *Alcyone*. He says that his group's preliminary assessment of the reefs has revealed surprisingly little damage since the 1950s, despite extensive coastal development.

Part of Jaubert's new job is fundraising, with Francine Cousteau's help. Before joining TCS, Jaubert had acquired a track record for wooing wealthy patrons, including Prince Rainier and Prince Khaled bin Sultan bin Abdulaziz of Saudi Arabia, whose Living Oceans Foundation lent Jaubert a ship and a seaplane for a string of expeditions in the 1990s. His plans for TCS include an expedition to the Seychelles and Maldives in the Indian Ocean, where 90% of coral reefs appear to have died in 1998, followed by an investigation of invasive species in the Mediterranean. Waves of invaders—including sharks and algae, the jumbo shrimp *Metapenaeus japonicus*, and the rainbow mullet—have infiltrated from the Red Sea via the Suez Canal since natural barriers to invasion disappeared a half-century ago.

Jaubert "has outstanding capabilities as an entrepreneur," says Jean-Pierre Gatusso, an oceanographer at CNRS's Oceanography Laboratory in Villefranche-sur-Mer, France. That kind of acumen, coupled with an accomplished career in research, might just enable Jaubert to stand out from Cousteau's long shadow.

—JOHN PICKRELL

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