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Fabien Cousteau looks out the window of Aquarius, an underwater science lab.

DEEP DIVE

TIME visits an ocean explorer during his 31-day stay on the ocean floor.

63 FEET UNDER THE SEA

Fabien Cousteau, grandson of a legendary explorer, spent 31 days on the ocean floor. TIME's Jonathan D. Woods visited him.

When I first see Fabien Cousteau, he looks like an astronaut on a spacewalk. In fact, he's 63 feet below the surface of the Atlantic Ocean, near Florida. He is camped out at the world's only **habitable** underwater science lab, Aquarius, with a team of scientists for a record-breaking stay lasting 31 days.

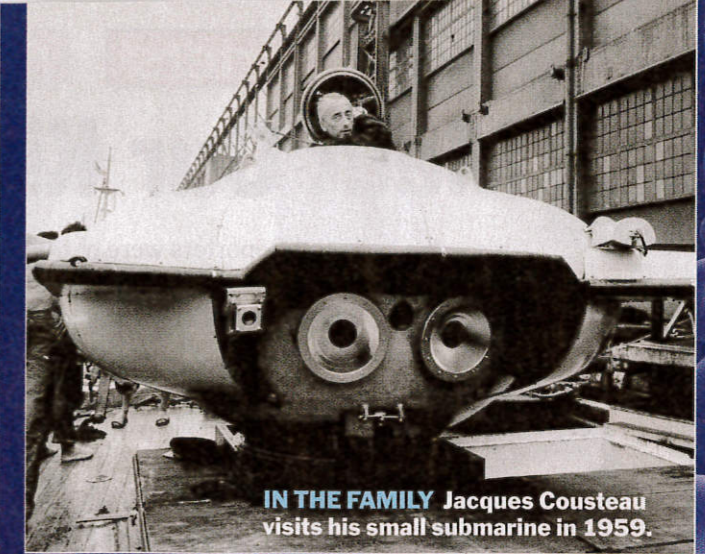
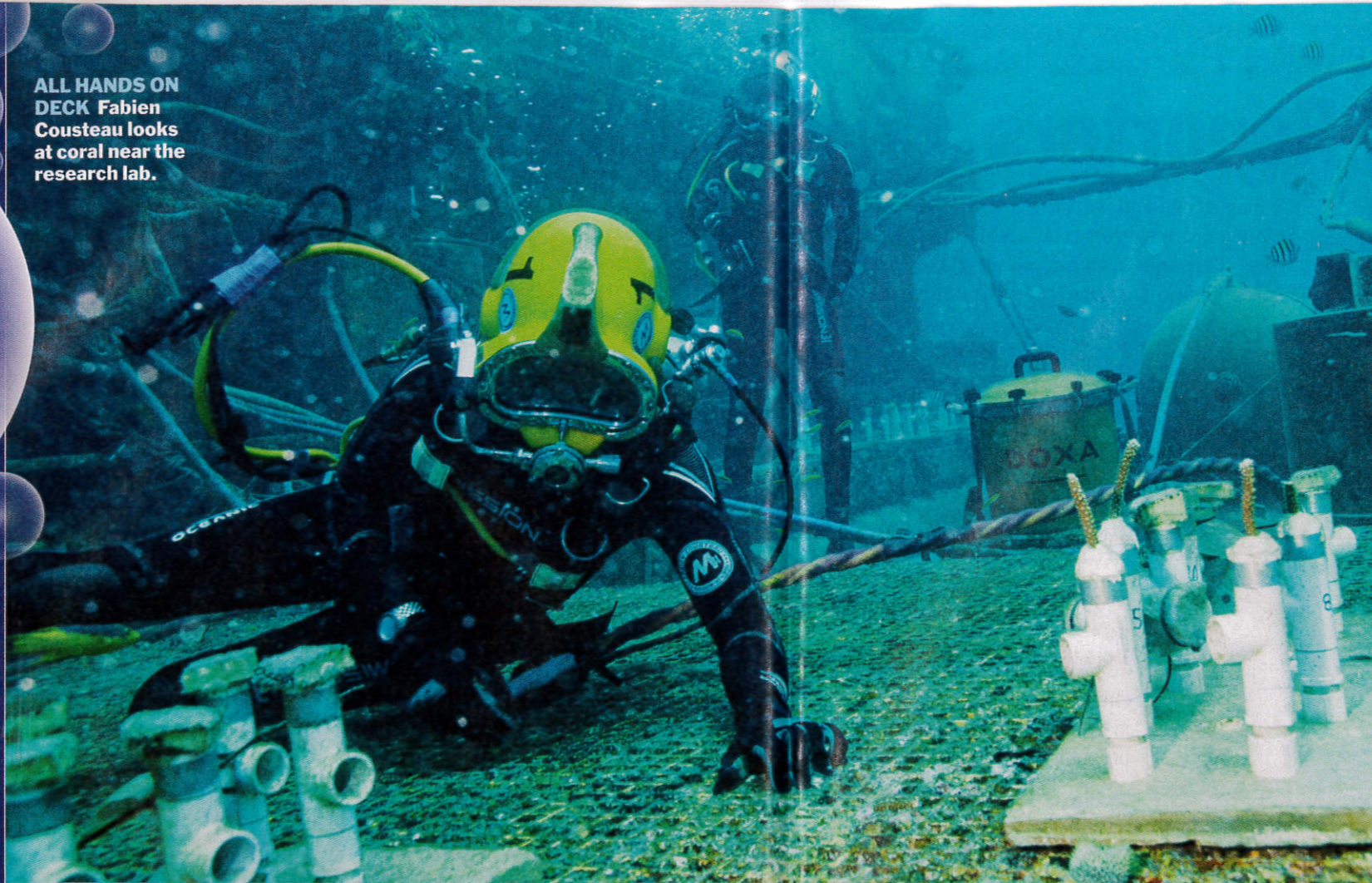
I visit on day 15 of Mission 31. The ocean explorer and environmentalist is studying coral. Cousteau and a rotating team of more than 30 others have been living aboard Aquarius, conducting research and filming a documentary about Mission 31.

Power Words

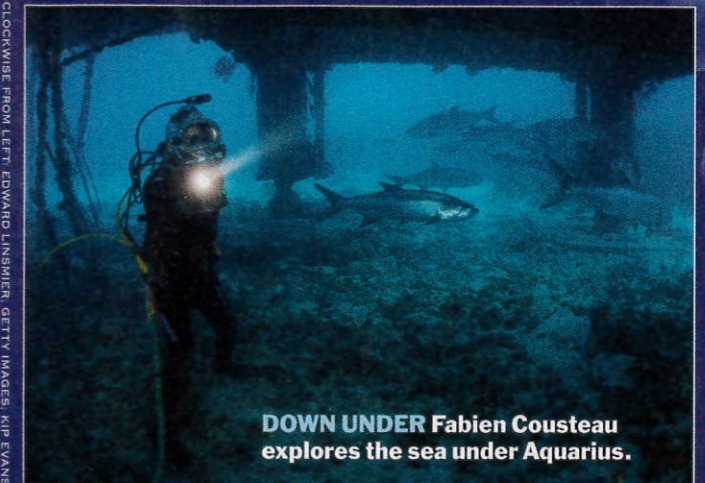
habitable *adjective*: a place that is safe or clean enough to live in

log *verb*: to make a record of

ALL HANDS ON DECK Fabien Cousteau looks at coral near the research lab.



IN THE FAMILY Jacques Cousteau visits his small submarine in 1959.



DOWN UNDER Fabien Cousteau explores the sea under Aquarius.

Cousteau is concerned about the state of the oceans. He wants to make a contribution to our understanding of how pollution and climate change are affecting them.

Mission 31 also carries on his family's mission. His grandfather was the legendary ocean explorer Jacques Cousteau. Fifty years ago, Jacques led a 30-day mission to study the seafloor. He cared deeply about the ocean and wanted everyone to share his passion. Fabien's Mission 31 is an answer to that call.

Not Your Everyday Dive

The National Oceanic and Atmospheric Administration first funded Aquarius in the mid-1980s. Researchers have used the lab off and on ever since. Inside are six bunks, a kitchen, and a toilet. The lab costs about \$15,000 a day to operate.

Even for experienced divers, Aquarius can be hard to get to. Reaching the lab is tough but thrilling. At a depth of 63 feet, I spot Cousteau with a pair of scientists. The whole scene is

astonishing. The seafloor is dotted with equipment. Aquarius is covered with coral and sea sponges. There is a small structure next to Aquarius called the Gazebo. It is an emergency backup in case Aquarius needs to be evacuated.

As I watch Cousteau, I realize that 50 years after his grandfather's dive, we still know very little about ocean life. Only 5% of the world's ocean waters has been explored. But because of technology, scientists are in a better position than ever

to learn about what pollution and a changing climate are doing to sea life. Computers have made it easier to **log** data. Underwater-breathing equipment makes long stays possible. Sensors and high-speed cameras help researchers see things the human eye cannot. In one Mission 31 video, high-speed cameras captured a mantis shrimp eating its prey. "You have to sit there for hours to get a few milliseconds of natural behavior," Cousteau told TIME.

Mission 31, Accomplished

On July 2, Mission 31 came to a close. Leaving Aquarius was hard for Cousteau. "You get used to it," he says. "Eels, sharks, barracuda parking on your shoulder, wondering what you're doing. Animals getting used to you in their environment."

The researchers say they recorded two years' worth of information because staying on the ocean floor saved travel time and because they weren't limited by air tanks. Their data is enough to produce around 10 new research papers, says Cousteau.

Aquarius will continue to host researchers for shorter stays. NASA will be down there soon to study human interaction in isolated environments. And Cousteau hopes someone, sometime soon, will launch Mission 32.

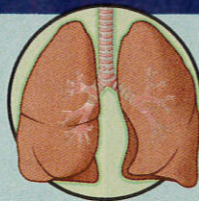
—By Jonathan D. Woods for TIME

LIVING IN THE DEEP

The aquanauts live together in a tight space. The air in the habitat is pressurized to equal that of the surrounding water. This can take a toll on divers' bodies in a number of ways.

LUNGS

The air inside Aquarius must be closely watched to prevent a buildup of carbon dioxide, which would result in poisoning. Sensors go off in the station when levels go too high.



EARS

Divers use a device to "equalize" their ears. Without it, the changing pressure could damage the inner ear, which is important for balance and hearing.



SKIN

Pressurized air contains more oxygen than air on land. That much oxygen plus very high humidity create a place where bacteria can grow. Cuts have a high risk of infection.



Think How is technology helping underwater exploration? Name two ways.