



The Challenger Deep could be the first manned craft to reach the bottom of the Mariana Trench.



RACE TO THE BOTTOM OF THE SEA

Graham Hawkes has devoted most of the past three decades to designing, building – and finding someone to pay for – a submarine capable of cruising the deepest reaches of the ocean. Now, with Richard Branson's money and his own refined technology, he's about to reach his goal – if James Cameron, Google's Eric Schmidt, and even his ex-wife don't beat him to it.

by **ADAM HIGGINBOTHAM** *photographs by* **DAN WINTERS**

In a neon-lit garage overlooking the marina in Point Richmond, California, the stubby white form of an experimental submarine with wings and a tail — a child's idea of a spacecraft — rests on a galvanized trailer. The blunt-nosed hull is 17 feet long and just large enough to accommodate a single man. It encloses a glossy black cylinder of wound carbon fiber that ends in a thick glass dome engineered to withstand the eight tons per square inch of pressure it will face sometime this year on its journey to Challenger Deep, the deepest point in the world's oceans — a place not visited by man for more than half a century. Beneath the cockpit, bright-red decals spell out the names of the men who plan to pilot the submarine and under their names in slightly smaller letters, a third credit. DESIGNER: GRAHAM HAWKES.

"This," Hawkes announces, "is Challenger." A sharp-featured Englishman in his early sixties, Hawkes may have designed more submersibles than anyone else alive — everything from torpedoes to revolutionary diving suits for oil exploration to an underwater "swimmer delivery vehicle" he's currently working on for U.S. special forces — but the vessel in front of him, known as DeepFlight Challenger, is unlike any of the other submarines he's worked on. "You're looking at a craft that is twice as deep as anything else," he says.

Hawkes had originally designed the submarine for Steve Fossett — commodities trader and professional adventurer — who intended to add a visit to Challenger Deep, at the southern end of the Mariana Trench, to his collection of firsts and world records. Hawkes was weeks away from completing the vessel when, in 2007, Fossett disappeared in a single-engine plane over the Sierra Nevada. Afterward, the submarine languished in Hawkes' workshop, awaiting the unlikely possibility that someone else with the money and nerve to use it would be found. Then, last year, Sir Richard Branson committed to funding the completion of the submarine — under the brand Virgin Oceanic — with Chris Welsh, a California real-estate entrepreneur and trans-Pacific yachtsman, as his co-investor and chief pilot.

DeepFlight Challenger is only the latest version of a dream that has obsessed Graham Hawkes for most of his adult life, a project that has endured through two marriages and several businesses, and survived despite a persistent lack of money, the disdain of scientists, and

the death of its most dedicated patron. It's a quest that has shadowed Hawkes' life to such an extent that he now struggles to remember how long it's been since he started. "The holy grail of my profession? To get to the bottom of the ocean? To solve that problem? Let's see," he says, calculating the time past. "Twenty-five years."

And yet, since the Virgin initiative was announced last April, others have come forward to outline their own plans to visit Challenger Deep, including one financed by the director James Cameron and another involving one of Hawkes' ex-wives. For all the decades of effort and millions of dollars the engineer has spent trying to reach his goal, it remains possible that someone else might get there before him.

Humans have entered Challenger Deep only once. On January 23, 1960, two men — U.S. Navy Lieutenant Don Walsh and Swiss scientist Jacques Piccard — squeezed into a steel ball and descended seven miles to the bottom under the weight of nine tons of iron shot. They stayed 20 minutes. Since then, 12 men have walked on the moon, but no one has returned to the bottom of the sea.

Now four separate groups share similar plans to send human beings seven miles down. In addition to the Virgin team, Cameron, who used Hawkes' submersibles to film his 3-D documentary *Aliens of the Deep*, has been working on his own project for more than five years, and Florida-based Triton submarines has also announced plans to reach 36,000 feet. In California, Google chairman Eric Schmidt has quietly funded the designs of two different machines capable of making the journey — by a team at DOER Marine, the company founded by oceanographer Sylvia Earle, who was married to Hawkes for six years. "For those who care about that, it's a race," Hawkes says. "I don't know that Cameron cares about it. I suspect he does. I think Chris definitely does. I think Virgin definitely does. They're racing."

But so far, the Triton and DOER submarines exist only on the drawing board. And Chris Welsh, who will pilot DeepFlight Challenger and hopes to develop his own business using deep-water technology, has been collaborating with Cameron's team — the competitors share specialized sonar equipment as well as buoyancy foam devised by Cameron himself. Given his head start, Welsh says he's closer to reaching Challenger Deep than Cameron, but any setback in a project this complex will cost so much time that the director could easily get there



In 2011, Richard Branson and Chris Welsh (left) announced plans to pilot DeepFlight Challenger to the deepest points in the ocean.

GABRIEL BOUVS/AFP/GETTY IMAGES

first. “According to the calendar today, we would be ahead of Jim,” Welsh tells me in late 2011. “But somewhere in the equation we could easily trip and lose six, nine months.”

Hawkes believes there is little danger anyone else will reach Challenger Deep before his submarine. “I don’t have to be smarter than anybody else. I’ve just plain worked harder and longer than anybody else. I’ve been thinking about this nonstop — and I’m 64. I think we’re way, way ahead,” he says. “Unless we’re idiots.”

Graham Hawkes, who is by turns taciturn and didactic, and who speaks in an accent so warped by decades of living in California that a BBC film crew recently asked him where he was from, did not come to submarine engineering out of a romantic attachment to the deep. As a teenager growing up in a colorless London suburb, what he really wanted to do was design aircraft. “I was enamored by the romance of the early days of flight,” he says. “When one person in their backyard could build a plane out of string and canvas with two wings and go and fly faster than anybody else.”

But without the grades to pursue an aerospace degree, Hawkes settled for engineering and, at 21, took a job making antitank warheads for the British army. It wasn’t until he began engineering torpedoes for the Royal Navy that he became interested in subs. “It looked to me like the aerospace industry was years and years ago,” Hawkes says, “when one person could make a big difference.”

His new enthusiasm coincided with a boom in offshore oil and gas exploration in the early 1970s, and he quickly found a job engineering the Jim suit: a giant magnesium alloy diving suit with articulated joints and hydraulic claws designed for work on deep-sea drilling rigs. Hawkes was charged with improving Jim’s depth rating, but when his suggestions to radically overhaul it were rejected, he quit to build a suit of his own. Painted bright yellow, with bulbous arms that resembled mandibles, the Wasp sold well at £500,000 a piece, and in the small world of commercial diving, Hawkes was a success.

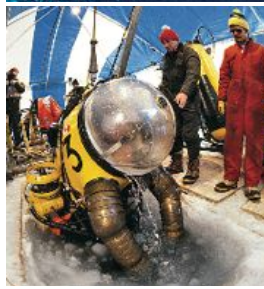
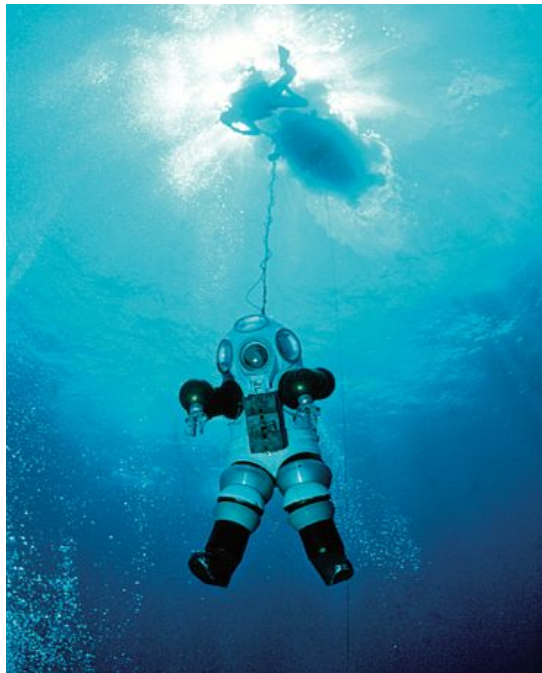
Yet from the beginning, he found that world to be a wild frontier where enormous financial stakes and a buccaneering spirit often trumped business ethics. Before the Wasp even went into production, Hawkes’ competitors seized a prototype and locked it in a warehouse, where they tried, unsuccessfully, to copy the design. It took two years of legal action to get it back. “I nearly had a nervous breakdown,” Hawkes says.

Early on, Hawkes learned to cope with designing around a lack of cash. Unable to afford the glass viewing dome designed for the prototype Wasp, he improvised by using a Pyrex salad bowl he found in a local market. In a Royal Navy testing facility, Hawkes took the Wasp — and its supermarket dome — into a pressure chamber where seawater was pumped in to reproduce conditions 2,000 feet beneath the surface. As the water pressure slowly increased to 60 atmospheres, the suit and the bowl held up well. But as the test wound down and pressure eased, Hawkes saw the glass crack. Then a piece fell off the inside. It was the kind of failure no diver ever wants to see: If the bowl had failed, Hawkes would have died instantly. But the outer skin held — and he set a record. “I don’t remember being that scared about it,” he says. “I was just a kid. You do that stuff when you’re young.”

The risks of piloting a submersible into the ocean’s extreme depths are bracingly absolute. Science writer William Broad once compared the water pressure that bears down on a submarine visiting the wreck of the Titanic to the weight of the Empire State Building — if the skyscraper were constructed entirely of lead. But that represents only a fraction of the water pressure at the bottom of the Mariana Trench: The Titanic lies two and a half miles down, less than halfway to Challenger Deep. The submariner whose vessel fails at these depths will have no warning that anything has gone wrong; he and his craft will simply wink out of existence, abruptly crushed into a cloud of sinking debris. “Pressure hulls collapse at the speed of sound. Once that starts, you’re inside your own little imploding atomic bomb, and you’re gone. You’ve never said, ‘Oh, shit.’ Never got the ‘oh’ out. Your body’s jelly before the signal’s ever got from the eyes to the brain. Everything’s fine, and then you’re dead,” Hawkes says, and smiles. “Great way to go.”

Deeper and Deeper

Reaching ever farther beneath the ocean’s surface has been Graham Hawkes’ main preoccupation and life’s work.



JIM SUIT

In the early 1970s, one of Hawkes’ first projects was engineering parts for the Jim suit, an exoskeleton with hydraulic limbs designed to manipulate the valves on deep-sea oil rigs.

WASP

For the Wasp’s viewing dome, Hawkes used a Pyrex salad bowl purchased from a local market, a decision that nearly cost him his life during testing. “I was just a kid,” he says. “You do that stuff when you’re young.”

DEEP ROVER

Hawkes and his second wife, oceanographer Sylvia Earle, launched the one-man Deep Rover in 1984. During sea trials, Hawkes set a solo dive record of 3,000 feet, which remains unbroken to this day.

DEEPFLIGHT CHALLENGER

In 2004, Hawkes designed the DeepFlight Challenger for adventurer Steve Fossett, who died before its completion. It languished in Hawkes’ shop until last year, when Sir Richard Branson funded its completion.

SUPER FALCON

Completed in 2008, the Super Falcon is a winged two-seater created for venture capitalist Tom Perkins. Hawkes considers it the zenith of his life’s work. “This is my Ferrari. I may never build a sub better than this one.” —BLAINE MCEVOY



Sylvia Earle (left) on the day she and Hawkes met in 1979; Hawkes (above, at right) seeking shipwrecked cargo in the Bahama Channel in the 1990s

craft that was so simple to control, Earle says, “even a scientist could operate it.” In it, Hawkes set a new solo dive record that remains unbroken — “3,000 feet,” he says now, contemptuous of such a shallow depth. “A joke!”

The same year, he made the first sketches of the craft that would become Deep Flight I. It was streamlined and elegant but, more

For years Hawkes regarded the idea of diving to Challenger Deep as a practical impossibility. That changed when he met Sylvia Earle in 1979. Then 44, Earle was already an internationally renowned oceanographer, a glamorous all-American answer to Jacques Cousteau. Meanwhile, Hawkes’ submarines — the Wasp and its successor, Mantis, which he would pilot as a bespectacled villain in the James Bond movie *For Your Eyes Only* — had become workhorses in the offshore-oil industry.

Earle was in Oahu preparing to film an ABC TV special, the climax of which would be the dive she planned to make wearing a Jim suit, descending to the ocean floor strapped to the front of a submarine. Hawkes was the technician on hand in case anything went wrong. Earle made it down to 1,250 feet where, released from the submarine, she walked across the bottom for two and a half hours, setting a woman’s depth record that still stands today.

But while she was down there, Earle found the manipulating claw on the Jim suit to be uselessly crude for the delicate business of collecting samples, and vented her frustrations to Hawkes. “It was only later that I found out he had designed it,” she said later. “I was so embarrassed.” Afterward, sitting on the end of a dock in Oahu, Earle asked him why she couldn’t travel the seven miles down to Challenger Deep. Hawkes’ first thought was that this was an absurd notion; it had taken him years to increase the depth rating of the Jim suit from 1,200 to 2,000 feet. “So I’m like, ‘I can give you a thousand reasons why — it’s just ridiculous.’” But Earle was insistent, and Hawkes began to reconsider. “After a couple of minutes, I said, ‘Maybe it could be done.’”

The next thing he knew, at 32, Hawkes was leaving Britain — and with it his job, his wife, and four children — for a new life with Earle in California. He was, he says, practically penniless — he had taken no real equity in the submersibles he had designed. Together, Hawkes and Earle began seeking donors to fund their shared vision: the construction of a submarine to reach full ocean depth. When they got nowhere, Earle mortgaged her house outside Oakland to help set up Deep Ocean Engineering, a commercial submersible operation they hoped would earn them the money for the project. They married in 1986.

With Earle’s input, Hawkes continued to make imaginative leaps in submarine development, reaching for an ideal that combined unprecedented ease of use with his own refined aesthetic. “He is an artist,” Earle says. “He likes to have things that are beautiful — not just that function, but that function within an envelope that is aesthetically appealing.” In 1984, they launched Deep Rover, a one-man

important, it broke free of the principles that until then had governed submersibles. Rather than taking in and blowing out ballast in order to dive, Deep Flight I would apply the principles of aviation to fluid dynamics: It would “fly” underwater.

Hawkes’ radical design would require a multimillion-dollar investment — and DOE’s board of directors didn’t see any commercial application in it. Hawkes came up with a new manipulator arm that was powerful enough to lift a cinder block but sensitive enough to sign a check. “The best work I’ve ever done,” Hawkes says today. To show what the arm could do, he used its eight-foot hydraulic claw to draw an intricate pen-and-ink image of a krill that he presented in a sales meeting with an executive from Chevron. “You know what happened? The guy is a big Texan, looks at the shrimp, gets this slow smirk on his face. He goes, ‘Well, I guess when we need to draw shrimps underwater, we’ll give you guys a call.’”

The arm never went into production. “If I’d built that thing for medical use,” he says, “I might be a billionaire by now.”

With the help of a dozen volunteers working two nights a week for beer and pizza, the submarine began taking shape in the DOE workshop after hours. But the work was slow, and eventually even the beer money dried up. By the end of the decade, Hawkes and Earle’s marriage was coming apart, and Hawkes was losing interest in the oil-exploration subs that had become the bread and butter of their business. “It’s his strength but also his weakness,” Earle says. “He gets so far, and he’s sort of solved the problem, but before it’s really where it ought to be, he has to move on to something else, because he’s bored with it.”

Soon Hawkes turned his attention to treasure hunting. The Scientific Search Project set out to find the wrecks of ships from the 16th, 17th, and 18th centuries that had foundered in deep water, aiming to salvage their cargo while preserving their historical value. It marked an abrupt ideological break from Earle, who dreamed of unlocking the secrets of the world’s oceans to preserve them for humanity, not to make a fortune. Using statistics suggesting that for 300 years, 10 percent of global shipping had been lost at sea, and a system he’d devised that made it simple to find and survey what remained, Hawkes won Wall Street funding and set out into the Bahama Channel on a boat christened Deep See.

The Deep See found up to five wrecks a day, the remains of centuries of doomed vessels sunk in an area infamous for bad weather. “We found everything: planes, submarines, tankers... a sailboat lying on the bottom, on its side, with its sails up.” They also, he says now,

FROM LEFT: CHUCK NICKLIN/AL GOODING IMAGES; INC. KATHY WILLENS/AP PHOTO

solved one of the most enduring riddles of the Bermuda Triangle. In May 1991, they discovered five Grumman Avenger fighter-bombers lying in a group on the ocean floor. At the time, the discovery caused a media frenzy. Hawkes was questioned by a dockside scrum of cameramen and interviewers who all wanted to know if the planes were those of Flight 19, which took off from Fort Lauderdale on a perfectly clear day in 1945 and vanished without a trace somewhere over the Atlantic — one of the legendary disappearances in the Bermuda Triangle. Then, as quickly as it had started, the sensation evaporated when Hawkes announced that further investigation revealed that the planes' tail numbers did not match those of the long-lost flight, implying that he believed the five planes must have crashed separately.

Hawkes has since changed his story. Now he says both he (because his investors didn't want to waste valuable time on an investigation) and the Pentagon (because they had more important things to worry about) had an interest in making the story go away. He admits that while he didn't find conclusive evidence that the planes were the same group that went missing in 1945, he consulted a statistician to establish the probability that they were *not*. "He said, 'You've got Flight 19,'" Hawkes says.

Perhaps the only thing that Hawkes' Scientific Search Project didn't find was a wreck that justified the cost of an archaeologically sensitive recovery. He was eventually fired from his own company. The enterprise was a failure, but it was while working on a documentary aiming to debunk the myths of the Bermuda Triangle that he met his third wife, Karen, who was working as a production assistant. With her help, he founded another company, Hawkes Ocean Technology, to begin building new submersibles, and returned to the partially completed Deep Flight I.

"She just agreed that we would put whatever money we had into finishing it, because if I didn't finish that, the dream was kind of gone."

Despite his insistence that he is merely an innovator, Hawkes clings to a romantic vision of ocean exploration, casting himself in the role of barnstorming pioneer — doing underwater the very thing that he arrived too late to do in the air. "If you go back to the early days of aviation," he tells me as we survey the incomplete DeepFlight

Hawkes finally made the inaugural trip in Deep Flight I in 1996, with a test dive in California's Monterey Bay, proving that the concept of underwater flight would work as he'd promised. But to actually reach Challenger Deep, he'd need a craft capable of diving far deeper. A plan for Deep Flight II was already on his drawing board, ready to go: a full-ocean-depth craft to carry two people. He estimated he would need another \$3 million to finish it. There were no takers until, four years later, Steve Fossett called.

That first conversation, in 2000, was awkward. "Very stiff," Hawkes says. "We were circling one another." Finally, Fossett explained what he wanted: to set the record as the first man to travel alone to Challenger Deep. Hawkes had an idea: What about a flying submarine? Fossett agreed. "Finally," Hawkes thought at the time, "someone who will foot the bill. Let's do it!" There was, of course, a problem. Hawkes visualized building a pair of flying submersibles to make the dive together — for safety and so that they could film one another during the journey. Fossett insisted on one submarine, to carry a single person: Steve Fossett. "Steve took this very seriously," Hawkes says. "People who set records parse things." He asked Fossett if he would be able to use the submarine after the record had been broken, to visit Challenger Deep himself. It was, after all, the goal of almost everything he had worked on for nearly 15 years. There was, Hawkes recalls, a long silence on the line.

"No," Fossett told him. "I set the record — it goes in the Smithsonian." "And I said, 'Well, Steve, I don't think we've got much to talk about.'"

And that was it for another four years, during which time Hawkes repeatedly tried and failed to raise the money to make the dive himself, and Fossett — on his sixth attempt — became the first man to make an uninterrupted circumnavigation of the globe by balloon.

At the end of 2004, Hawkes finally gave in. At the library of the adventurer's estate in Carmel, California, they struck a deal: In exchange for building a single submarine that would make a single trip to full ocean depth and secure Fossett the title of Deepest Man on Earth, Hawkes would retain the intellectual property of his design.

The engineer worked closely with Fossett on the project for years but found his motives inscrutable, and they never became friends. "I admired the guy," Hawkes tells me. "But we didn't get on." The machine

"I DON'T HAVE TO BE SMARTER THAN ANYBODY. I'VE JUST PLAIN WORKED HARDER AND LONGER. I THINK WE'RE WAY, WAY AHEAD," HAWKES SAYS. "UNLESS WE'RE IDIOTS."

Challenger, "the guys designing it built it, and then they got in it and flew it. I mean, who does that anymore? Today you have professional test pilots — I get to fly that thing."

Hawkes' original plan for the DeepFlight Challenger dive called for the submarine to take a 12-mile-long exploratory flight along the Mariana Trench, collecting a stream of data from the deep ocean floor. But many marine scientists, including Sylvia Earle, say that his vessels are little more than sophisticated toys; that unless they can hover in place to collect samples or take photographs, they're of little use. Hawkes has heard it all before. "Nothing gets me more riled up than that," he says. "Look, I've built 60 subs that hover. Do you think if I wanted to hover I can't do that?"

Still, Hawkes is confident that man's ignorance of the oceans is such that whatever is found at 36,000 feet will be of profound scientific interest. After all, the thermal vents and cold-water seeps that are now known to bring life to much of the deep were only discovered in the past few decades. When Walsh and Piccard emerged from the Trieste in 1960 claiming to have seen a flat fish near the bottom of the trench, ichthyologists insisted they must be wrong; even now no one knows for sure. "Man doesn't know whether there's fish down there or not? I think that's just wonderful," Hawkes says. "I like the controversy."

But for Hawkes, whatever lies at the bottom of Challenger Deep could prove to be an entirely academic question: The way things have turned out, he may never get to see it for himself.

Hawkes built for him was stripped down and austere, engineered from materials on the outer limits of experimental technology. At Fossett's insistence, safety margins and equipment were shaved to make savings in both cost and weight; Hawkes, once again, scavenged for parts. In May 2007, DeepFlight Challenger was undergoing final testing in the Applied Research Laboratory Building at Penn State when, subjected to the 16,000 pounds per square inch of pressure it would endure at the bottom of the ocean, the glass viewing dome of the submarine cracked — the result of a manufacturing fault. By now, Fossett had spent \$3 million on the project and wanted to see a swift return on his investment; he became ever more deeply involved in micromanaging the work. By the end of August 2007, the submarine was weeks away from sea trials. Then, at 8:45 on Labor Day morning, Fossett climbed into his single-engine Super Decathlon in the Nevada desert, taxied down the runway, and vanished into the sky.

Sitting at the bar of a hotel in Pebble Beach, California, where every evening a bagpiper in full Highland regalia pipes the sun down across the links, Chris Welsh wears the uniform of the off-duty yachtsman. In shorts, a polo shirt, and a well-used pair of deck shoes, the 6-foot-3 Welsh sports a shaggy blond beard and a heavily weathered baseball cap bearing the logo of the St. Francis Yacht Club in San Francisco. It was there, over post-race cocktails (continued on page 114)

in 2009, that he first heard about the orphaned vessels being sold off by the Fossett estate — a million dollars for the one-man submarine, another million for the carbon-fiber catamaran to carry it across the Pacific to Guam and the Mariana Trench. He says he knew he had to have Challenger the second he saw it in the workshop. “The door to the room probably hadn’t been opened in a year and a half. It was a project that was asleep.”

At that point, Richard Branson, whom Welsh had met a couple of times, had already considered reviving the expedition himself but decided it was too dangerous — for him, or even to hire someone to pilot it for him. Welsh juggled his real-estate investments to buy the submarine, and then flew to London to change Branson’s mind, presenting his advisers with both a business plan and a pilot who was already committed to making the seven-mile descent. “I was going,” Welsh says. “So the ethical dilemma of hiring somebody for something risky was done.”

Virgin’s plan now calls for not one, but five dives to the deepest points of each of the world’s oceans. Welsh will pilot the first, to Challenger Deep; Branson, the second, to the bottom of the Puerto Rico trench in the Atlantic, conveniently located in the backyard of his private playground on Necker Island. Welsh still has no firm date for the Pacific dive but is planning to go this summer.

When we meet, his experience in submarines is limited to a few hours in a resort-tourism submersible in Seattle Bay, but he says his lack of sub-sea time doesn’t bother him: “I’ve got thousands of hours of experience flying; I have beyond tens of thousands of hours on the water. I have the technical knowledge of how the craft works. I understand where risk is and where risk is not.”

Hawkes is less sanguine. Sitting in his sailboat one evening in Sausalito, he reluctantly admits to concerns about Welsh’s intentions. He emphasizes that he originally designed DeepFlight Challenger to make a single trip with Fossett at the controls, and then to be sent directly to a museum. He talks in intricate detail of the safety factors built into his designs, of the corners he agreed to cut for Fossett, of the way individual strands of carbon fiber might flex and snap when subjected to 1,000 times the atmospheric pressure of sea level.

“Look,” he says eventually, “we’ve agreed to finish the sub off to its original purpose. It’s their machine. I can’t say what they can and can’t do. Perhaps I could, but I don’t. It’s their machine, right?”

“But it sounds as if you would advise them to use it only once.”

“It’s designed only to be used once. That’s the point.”

Recently, Hawkes spent a summer reading history books about forgotten pioneers: early unmanned airplane designers; the fin-de-siècle Brazilian dirigible enthusiast Alberto Santos-Dumont, who kept a craft moored to a lamppost outside his Paris apartment; a Basque engineer who launched one of the first submarines. “Great characters,” he says, “that did neat stuff — ahead of their time.”

He says they taught him a crucial lesson. “One characteristic of being too far ahead of your time is that you die miserable and poor. I said, ‘Karen, let’s not do that. I may be poor, but I’m damned if I’m going to be miserable.’”

Today the small team at Hawkes Ocean Technologies is working on two defense contracts for DARPA and the Navy. Hawkes himself has little day-to-day involvement with the DeepFlight Challenger project; he is now simply a contractor, paid by Chris Welsh and Virgin to complete the submersible. He hopes to be the Challenger test pilot but isn’t certain he will be.

Whatever differences he had with Steve Fossett, at least he wanted Hawkes to oversee the trench dive from beginning to end. Hawkes had anticipated sailing out of San Francisco Bay on the catamaran, passing beneath the Golden Gate Bridge with the submarine strapped to the deck, bound for Guam. “I would have been grinning from ear to ear.”

But those plans have changed. Now Hawkes, who spent so much time imagining his own trip to Challenger Deep, may not even be there to watch the submarine he designed begin the seven-mile journey to the bottom with another man at the controls. Yet he insists that being absent from the climax of a quarter-century of work won’t bother him. In the days following Fossett’s death, he says, he seriously considered taking everything he and Karen had and finishing the submarine himself. But then he realized that in his mind, he had already made the dive to Challenger Deep himself.

“It’s very hard to understand, I know. But, I mean, I lived that project. When I wrote up Fossett’s flight plan. . . .” He trails off. “I’ve flown that. I’ve flown that! It’s how I design stuff. You know, how does that thing roll? How does it move? It’s in my head. I’ve done it. Do I want to see if I’m right? Yeah. But I’m pretty sure I am. Do I know the psychology of going that deep? Probably as well as anybody. Would I like that challenge? Oh, yeah — I would like to do that. But is it going to eat me up that I can’t? Best not to.”

In the years following Fossett’s death, Hawkes continued to improve the technology he had developed for DeepFlight Challenger. He invented a remote-controlled machine gun now used to guard nuclear installations across the United States and built a submarine that is faster, lighter, and more sophisticated in every way than the one that still sits unfin-

ished in the Point Richmond workshop.

Originally built as a multimillion-dollar plaything for venture capitalist Tom Perkins, the Super Falcon is finished to the specifications of a luxury sports car and is even less like a submarine than its predecessor. A sleek two-seater with wings, rudder, and a tail, it looks as if it could easily take to the sky.

Hawkes plans to spend five days in Lake Tahoe experimenting with the Falcon’s capabilities in underwater aerobatics — “hydrobotics,” he calls them — for an upcoming National Geographic Channel show, *Alien Deep*. “This,” he says, “is the birth of underwater flight.”

Hawkes considers the Falcon the zenith of his life’s work, and whenever he talks about the experience of piloting it, he gushes with a geekish enthusiasm. He says he’s spent his entire career making giant leaps in underwater technology but never stopped to fine-tune until now. “If you build a Model T and you can see the Camry, you don’t spend time tinkering with the T; you go straight to the next thing. Once you build the Camry, you can see the Ferrari, so you go straight to that. This is my Ferrari.” He pats the Falcon on the fuselage. “I may never build a sub better than this.”

Back in Sausalito, after dinner at a marina restaurant, Hawkes tells me a story about James Cameron. He says the director once told him that if Hawkes ever did make it to the bottom, nobody would notice. “It would be like a tree falling in the forest,” Cameron said. Only with a Hollywood film crew in attendance would the exploit gain a global audience. Yet Hawkes says he believes Cameron’s vision of the ocean shown in *Aliens of the Deep* is the wrong one, that the underwater films he’s made are so garish and overlit that they make the undersea world look like a special effect.

And once he says this, the engineer becomes almost lyrical: He talks of wanting to capture the true mystery of the deep, the abyssal darkness and the soft fall of marine snow, the tantalizing shapes of the unknown casting giant shadows just beyond the cone of the spotlights.

“I’ll tell you a secret,” he says. “If you look carefully, you’ll see camera mounts on the Falcon.” Hawkes plans to beat Cameron at his own game — but not just yet. The camera technology, he says, is not quite where he wants it to be. ☐

WHERE TO BUY, PAGES 108–113 **Uniqlo** trench at Uniqlo Fifth Avenue. **Levi’s** apparel at levi.com. **Rag & Bone** sweater at Bergdorf Goodman. **Band of Outsiders** shirt at Local 35. **Inhabit** shirt at inhabitny.com. **A.P.C.** jeans at apc.fr. **John Varvatos** apparel at john varvatos.com. **Filson** umbrella at filson.com. **Worth & Worth** hat at hatshop.com. **Oliver Peoples for The Soloist** sunglasses at Barneys. **Bulova** watch at bulova.com. **Dockers** khakis at dockers.com. **Cole Haan** boots at colehaan.com. **J. Crew** apparel at jcrew.com. **Rag & Bone** jacket at Rag & Bone stores. **Longines** watch at longines.com. **Gap** apparel at gap.com. **Sunspel** boxer shorts at Unionmade, San Francisco. **Lacoste** socks at lacoste.com. **Splendid Mills** shirt at splendid.com. **Tommy Hilfiger** shirt at Hilfiger Denim, New York.