Science Under Pressure: Chapter 1

ATLANTIC OCEAN, BAHAMAS, NEARLY 20 YEARS LATER

The Atlantic Ocean is as still and blue as a swimming pool. It's a perfect 80° F day off the coast of the Bahamas. The water is so calm our ship, the Seward Johnson, seems to have gently melted into the sea.

I'm standing on the deck with legendary scientist, Dr. Edith Widder. She is one of the world's leading experts in deep-sea and bioluminescent animals. Those are animals that create their own light to communicate, find food, avoid predators, or attract mates. (A firefly is bioluminescent, for example.)

Making more than 200 dives, Edie has spent more time in the ocean's depths than almost anyone. In addition to being a world-renowned scientist and explorer, Edie is a sub-pilot, patent-holder for light measuring equipment she invented, was the first person to ever film bioluminescence in the sea, and has won awards for her genuis.

Sub Club

Edie has invited me on a once-in-a-lifetime adventure to visit a world less then 15,000 people in all of human history have explored.

Shading my eyes and feeling the sun bake my skin; it's hard to believe that in less than 30 minutes I'll be in a world of pure darkness and near freezing temperatures. I'll see a world without trees, flowers or stars. It sounds more like outer space than any place on Earth. For all I'd read and learned about the deep ocean, I still couldn't imagine what it was like.

Instead of diving in the WASP, as Edie did many years ago, we're diving in the Johnson Sea-Link deep sea submersible. Nicknamed "JSL," this amazing vessel will take us down 3,000 feet (1,000 m).

With barely enough room for four people and no bathroom, the JSL isn't luxurious. But it is the best ride in the world if I want to be a modern-day pioneer like Edie.

The Johnson-Sea-Link is 26 feet 4 inches long and 9 feet 9 inches wide. It's about the size of a small school bus, but much less roomy or comfortable. All JSL's space is taken up with the propulsion systems, batteries, life support, emergency breathing equipment (extra air!), computers, cameras... and other things not involving leg-room.

The JSL has two completely separate compartments. Sub-pilot Phil Santos and Edie will be in the front compartment called the "pilot sphere." Today, I'm playing second scientist and riding in the back or "aft" compartment with co-pilot Frank Lombardo.

Edie easily climbs the 12-foot tall ladder to the top of the JSL.

Once on top, Edie drops feet first inside the front compartment through a 17.5 inches wide hatch — about the size of a large pizza. She slithers into the sphere like an uncoordinated snake. Twisting and bending slowly and cautiously, she's careful not to bump, crush, or step on any of the delicate equipment. (Like the buttons that

control the air or propulsion systems. That silly stuff we'll need in the deep!)

It's easier to get inside the aft compartment. I simply crawl underneath the sub. Then with a helpful leg-up from a crew member, climb up about 3 feet through the 20" wide hatch.

No matter how hard it is to get inside either compartment, the view will be worth it.

Fasten Your Sea Belts

Imagine sitting in an airplane and just before take-off the pilot turns to you and says, "If something happens to me — and the co-pilot — here's how you land the plane. You flip these switches and...."

That's what happens when you dive in the JSL. Frank, who was sitting cross-legged on the floor, looks at me and said, "Now, if something happens to me, here's how you get air, here's how you contact the surface. Push these buttons to...."

I chuckle. Then realize he is serious — deadly serious. Panic bubbled at the edges

of my thoughts while I attempt to memorize every word. It's like cramming for a test — one I couldn't fail. Frank rapidly points out where to get more air, find food, release the ballast tanks to make the submersible pop to the surface and other life-saving information.

Pointing to the front porthole, he adds, "In case the headsets don't work, pencils, paper and a flashlight are here. You can hold notes up for the pilot, which he can see through the matching porthole."

Then he tells me we have 5 days worth of air and food in case we're stuck. "Oh," he adds, holding up a stack of thick plastic bags, "And here's the bathroom."

Though I try to act cool, I fight the urge to dive out the hatch. A few minutes before, I only had tiny "what if" worries. Since Frank was trapped inside the compartment with me, I fretted over silly things like getting seasick, having bad breath, stinky feet or the worst possible thing, uncontrollable gas.

I admit I thought, "What if there's a crack in the hull?" The likelihood of that deadly situation happening was so small I wasn't really concerned. But in less than a minute, Frank had added several very real things to my worry list — fire, communication problems, not getting back to the surface for days, and others things I hadn't even imagined.

Positive Frank could hear my hammering heart, I took a couple of deep calming breaths to mute the sound. The safety session made sense. In a submersible, you can't just open the door and swim to the surface. Although overlapping safety plans are in place, you never know what might happen. And being in the middle of the ocean isn't the place to find out you are unprepared.

As I tried to commit Frank's instructions to memory, it was comforting to know the Seward-Johnson would be waiting for us above — like a guardian angel. The 168-foot research ship (that's about half the size of a football field) had several different methods of retrieving us.

Logically, I knew in many ways I was safer in the JSL than I was in my own car during rush hour. But I could also climb out of my car if it quit working — and running out of air was never a worry.

Splash Down

Running through his final safety checks, Frank's precise movements remind me of an astronaut preparing for take-off.

Out the porthole, which is about the size of a dinner plate, the crew scurries around deck preparing for our launch. I even get a thumbs up from one of the University of Tennessee students aboard to watch research in action.

As if I'd swallowed live fish, my stomach flips then flops as waves of excitement and fear wash over me. I guess it is silly to be afraid. After all, I know the JSL is safe. The pilots and crew are experienced and well-trained. But a little voice in my head keeps reminding me that deep-sea travel is more dangerous than rocketing into space. Atmospheric differences, total darkness, crushing pressure, and the enormous size of the oceans make every aspect of deep-sea exploration a challenge. Plus, astronauts rarely worry about predators like a giant squid — three times larger than their vessel — looking for that "crunchy on the outside, chewy on the inside" snack.

Because of the dangers and difficulties of deep-sea research, twenty years after Edie's first encounter with the glowing siphonophore, ninety-five percent of our oceans are still unexplored. Scientists know more about surrounding planets than our own seas. Yet, most of the earth and its inhabitants are under water.

Fortunately, my internal debate is interrupted by the sound of the hatch clinking shut. Frank seals it by spinning the metal steering wheel-like doorknob — just like the movies. Pointing to a gray carpet flap folded back from the hatch, he said. "I won't cover the hatch 'til we're 100 feet down. I have to make sure the seal is tight by checking for leaks." (Great, one more thing

for the worry list!)

I barely feel the 29,000 lb submersible lift off the deck. Hovering above the deck, we're held aloft by a cable from the A-frame crane. I thought we'd swing around like the ringer in a bell. We don't. A stabilizing rope anchored from the second deck of the ship holds us in place.

The crane carries us across the ship's deck and over the bow. We clear the boat, then hang several feet above the sea.

Waiting for the journey to begin, I think about Edie's amazing research from vessels like this, the animals and the discoveries. I can't wait to become a part of it.

With the gentleness of a mother setting her baby in a crib, we are lowered into the water.

Ka-chink, we're set free. For a moment, I have an amazing view of two worlds: a pale sky, scattered clouds and the ocean, so blue it doesn't seem real. As if we're in the world's best elevator, we immediately sink into the sea.