

## **Sylvia Earle**

### **Background Information**

#### **Birth and Childhood Home**

She was born in Gibbs town, NJ on August 30, 1935. Her early childhood years were on a farm where there were many woods to explore. One of her favorite places was a pond. Her parent, particularly her mother was very influential in teaching her respect for animals. She always emphasized putting animals back where they were found after observing them. Sylvia took notes as a young child on the things that she observed. They also taught her not to fear the unknown.

#### **Horseshoe Crab Story**

Sylvia as a little girl at the beach was curious about the horseshoe crabs and how they moved. She was also concerned that they were stranded on the beach. She tried to pick them up, turn them around and sent them back to the ocean, not realizing that they were coming up on shore to lay their eggs and that she was really interfering with their mating. (see additional notes on horseshoe crabs)

#### **Reading**

As a child she liked to read. She liked science fiction, fairy tales, and animal stories. As she got a little older, she found that she liked non-fiction books even better. One of her favorite books was by William Beebe name Half Mile Down. He wrote about going down in the ocean in a vehicle like a submarine. In her book Sea Change and some of her other writings and interviews she refers to it frequently. After reading that book she started reading more non-fiction books and began liking the encyclopedia. This desire to read the encyclopedia was before she was 12. She considered every page a new adventure. Now she likes both fiction and non-fiction books and feels one can learn a lot from both types of books.

#### **School**

Sylvia liked school. In one of her interviews she said she "felt the joy of discovery" and liked to absorb knowledge. She commented that she liked it "when she could get her mind around the math problems because she got a sense of accomplishment when she succeeded.

#### **People Who Were Major Influences**

Her parents who encouraged her and wanted her to follow her heart. A college professor, Harold Humm, with whom she is still in contact, and one of her junior high teachers Edna Tenure who was very encouraging.

#### **Choice of profession**

For a while she thought about being a vet because she loved cats, dogs, and horses. However, she realized she was more fascinated by wild animals.

#### **College**

She felt it was really an advantage to work in the labs. That's where she could get better acquainted with the people in the field of study. In college, she had a hard time deciding what to specialize in. She liked everything. However, Harold Humm, the professor who introduced her to

scuba diving influenced her to specialize in plant life. Sylvia reasoned that if she understood the plant life she would understand the whole natural system since plants are the base of the system. When she went on that first scuba dive she went 15 feet deep and was 5 miles from shore. In college, Dr. Earle started a project of collecting all the plants of the Gulf of Mexico. Her collection now includes over 20,000 specimens mounted in herbarium fashion. Her education started at junior college, she received her bachelor's degree from Florida State and her Masters and Doctors degrees from Duke University. Her family did not have a lot of money, and she financed her education with scholarships and work.

### **Career**

In 1962, she had a chance to go on a ship to the Indian Ocean. At that time it was a very unusual thing for a woman to do. A reporter met her, and she wanted to tell him about her research plans. He was not really that interested in her research but more interested in how she was going to manage with 70 men. She told him she did not expect any problems. The next day the headlines read, "Sylvia sails away with 70 men-she expects no problems. " On that voyage she saw places deep in the ocean nobody had seen before and discovered 2 new plants.

Early in her career she was a Resident Director of Dr. Eugenie Clark's lab in Florida. Dr. Eugenie Clark is a well-known oceanographer who has done most of her studies on sharks. While Sylvia was at Eugene's lab, she "long lined" for sharks. The living ones she either put in holding tanks or released. The dead ones were measured and dissected. When she was diving in this area she seldom saw one, but they always got a variety of types when they used the long lines. You undoubtedly will be asked about sharks as the kids are interested in them and might use this material as part of what you tell them.

Another vehicle she went in was Deep Diver in 1968. This occurred in the Bahamas. This was her first time in a submarine, and she was able to swim out of it underwater. At the time she was 4 months pregnant. Her doctors had approved it -something now they recommend against but it caused her no trouble (Sea Change, 61). Deep diver was a type of submarine that made the pressure inside where she was the same as the depth she was going outside. On her way back the pressure was gradually decreased, so she could start the decompression. Therefore, time for decompression when she reached the surface would be less. (Note: as you go down in the ocean the pressure increases)

### **Tektite**

In 1969, the officials at the lab did not really expect any women to apply. However, a number of qualified women did apply. The people doing the selecting did not feel that they could accept the idea of men and women living together underwater even when there were going to be cameras on them at all times. However, they could not ignore all the qualified applicants. Therefore, they came up with the idea of an all women team.

Part of the purpose of the mission was to see how people would react in a closed confined space. They hoped to get information to compare those conditions to the conditions in space. They also wanted to learn how practical saturation diving was. The project that Sylvia suggested was to study the impact that the grazing fish had on the number and kind of plants in the area. She had wanted to team with three male ichthyologists (fish scientists.) Obviously when she was not able

to go with the team she wanted, her research plans had to be modified but she felt that some experience was better than no experience

She knew that she would be watching the fish who in turn would watch the aquanauts as while at the same time psychologists would watch the aquanauts watching the fish and the aquanauts could also watch the watchers while they watched other aquanauts watch the fish

The women were called aquanettes, aquabelles, aquababes, and even aquanaughties--this amused the team of women but at least they were glad someone was paying attention even if for the wrong reasons. They even rewrote some headlines "Beacon Hill Husband leads Team of Male Aquahunks" (Beacon Hill was where Sylvia lived.)

One new tool that they used on this mission was a rebreathing system--what happens is that after the air is breathed oxygen is added and the carbon dioxide scrubbed out. The advantage of such a system is that there were no bubbles as there are from scuba, and they could observe much less conspicuously. Also, the rebreathing system was quieter and therefore they could hear nature better.

The Tektite was located 50' underwater. The diving range for the aquanauts was 20' to 100'

One reaction that Sylvia gave to the experience was that you could compare this saturation diving to scuba as you might taking a walk in the woods for a half an hour versus camping there day and night for a couple of weeks. You certainly can learn more camping than in an area than merely walking in it, just as you could learn more living in the tektite hab just scuba diving in the area.

During the two weeks they were able to recognize some individual fish and were able to see what the animals did day and night, and they got to know the individual places that individual animals claimed at home.

Sylvia participated in the Hydro lab, which was a similar type experience--she participated in 5 missions

When the team of women received so much attention, men looked at it as a form of reverse discrimination. The men's teams had done the same type of thing, but nobody paid much attention to them. It was after this experience that she began to write for the layman. (Note so technical, so that the populace in general could understand).

### **General background on whales**

One of the things that Sylvia was interested in was how the Humpback whale makes its sounds. One thing they discovered is that it has nothing to do with their breathing. When they finally saw a whale making a sound (a very difficult thing to see) there were no bubbles. They still do not know how they do it, but they know one way that they do not do it. This was not Sylvia's observation.

One project that Sylvia did was to keep track of the fish that she saw around the whales and the dolphins. She also kept track of the animals that attached themselves to the whales. There was an acorn barnacle, a goose barnacle, and lice. Sometimes there would be as many as one half a ton of animals attached.

They also wanted to find out the migration patterns. They knew at that time that in the winter there were whales in Hawaii and that there were whales in Alaska in the summer, but they didn't know if they were the same ones. Her team began to identify the whales by their flukes and to take pictures of them and name them. A couple of years later they found out that some ones from Hawaii were in Alaska. Although not related directly to Sylvia now there are ways to track the humpbacks to individuals and trace their individual progress.

The whale study was for 4 years in Hawaii, Alaska, and other places.

Prior to this, whale study had been done from the surface. The idea was to study whales in their own environment. Previous work on whale sounds had been done by lowering microphones into the water.

While studying the whales they lived on a sailboat and used a small rubber boat to get where they wanted to go.

Since Sylvia did this work there has been a lot learned about whales – this is not the most current research on whales. There are people now in Washington state that are tracking the whales and recognizing them by individuals. Remember the material that can be put in the script is her experience and this material should not be used as current facts about humpbacks. The story of the humpbacks is basically been used to lead into the Jim Suit story.

### **Sylvia and the JIM Suit**

The date of the dive was September 19, 1979. The place was Hawaii. The depth was 1250 feet. This was the dive that got her the nickname of "Her Royal Deepness."

She started the trip on the platform on the front of the small submarine Star 11. When she got to the ocean floor she freed herself from the platform. She was only connected by the communication cable. As she went around the ocean floor the submarine followed her. Normally when the Jim Suit was used it was connected to a ship or shore.

The JIM suit was named after the first person who dived in it.-Jim Jarrett

JIM protects the individual from outside conditions. They are always at 1 atmosphere of pressure. The JIM suit weighed 1/2 ton.

The JIM suit was so large that she could pull her arms out-in there she had a notebook, a camera and several lenses-her shoulder bag with "essentials-an apple, Snickers bar, pens, film, and a rag to wipe condensation of the ports" and a hammer to strike the release mechanism of the weights if there were an emergency and if her muscles were not strong enough.

The JIM suit had the rebreather system-JIM had lumps of lead hung outside at waist to offset buoyancy caused by air inside the suit-this buoyancy can be released by turning a lever inside the suit

After a lot of photographing had been done she turned off the lights to examine the bioluminescent activity.

Scientific Facts Relative to JIM Suit Trip and Light: Only about 1% of the light that one would see at the surface of the water reaches 325' depth. At 1952' illumination is about like starlight from the sun and below 3000 feet it is blackness. Red and yellow wavelengths of the light are absorbed leaving the green and blue to go to the deeper areas. Thus animals that have red and yellow pigments appear black. Because of the type of light at the depths many think that most deep-sea animals may not have color vision. At those depths there are many transparent animals as well as are many bioluminescent animals-probably 85% of the animals from 650 to 3900 feet deep have bioluminescence. This may be useful in attracting mates.

### **Going into Business**

World of business had more perils than the undersea "perils-wanted to create new equipment for ocean exploration-she wanted to make a difference while she made a profit (Sea Change, 123) her business would be a place where equipment could be developed for ocean exploration Earlier research submersibles were built for two or three people-that presented a problem for Sylvia who to often told the driver too late that she wanted to see something-she wanted to drive it herself. She wanted a vehicle for one that she could travel in freely to the deepest depths of the ocean and that had arms and hands that could touch, feel and retrieve objects and something that someone could stay down in a considerable length of time.

Original idea was to find a sponsor for an idea that Graham Hawkins had-no takers-people interested but not willing to put up cash. Since there were no takers a business was formed Deep Ocean Technology and later Deep Ocean Engineering to develop. At this time funding for manned submersibles was difficult to find but there was considerable interest in unmanned submersibles or Remotely Operated Vehicles (ROV) While they were designing ROV's they could perfect the arms. Many of the customers were from the oil industry so when it had hard times so did the business. In business negotiations Sylvia many times as a woman scientist was not taken seriously. Sometimes men in a meeting would negotiate as though she was not there. It made it very easy for her to ask to delay signing contracts until she could "consult with other directors"-gave time to develop revisions-their chairman began to refer to her as their "secret weapon." In 1985 Graham Hawkes, thought about a vehicle that could accomplish much of the work larger ROV's did for a lot less money-this was developed under Deep Ocean Engineering-named Phantom-used in more than 30 countries. Phil Nuytten and his Canadian company built one Deep Rover-wanted to test it at max depth 3300 feet tested around San Diego-needed a support ship- Got Egabrag III (which is garbage spelled backward) when Phil Nuytten was doing his dives he found a huge garbage dump. They found an area nearby and that is when Sylvia found the RC can as well as other trash.

### **Government Service**

During the George H. W. Bush administration Dr. Earl was the Chief Scientist for the NOAA (National Oceanic and Atmospheric Association). This is a position that is appointed by the president-then President Bush and confirmed by the Senate. She wanted to encourage undersea research and conservation practices. While she was in this position, she went in one of the Japanese vehicles to a depth of 13,500 feet. This was in the Nankai Trough, just off Japan's southeastern coast. She was also the first oceanographer who went to Kuwait to see how devastating the oil damage had been. There is a National Geographic article written by her on this. She left this position in 1992 deciding that she would rather be a private citizen and be able to speak out on issues completely independently and as she saw fit.

### **Attitudes about combining a family and career**

She feels with some careers there is a problem, but there are some things you can do to make it easier such as setting up a lab and library at home. She said that she would recommend to girls to give it a try. She says it may not work but if you don't try it definitely won't work. With a lot of support from her parents with childcare, which made it possible for her to do some things she did.

### **Attitudes about women and careers**

She grew up in the time when the occupations were wife and mother, teacher, nurse, or secretary. Her parents did encourage her to get a teaching credential and someday she said she might like to teach. However, she felt that there were other things out there, and that she could be whatever she wanted to be.

### **Attitudes toward danger**

She gets her courage from the real dangers like driving the freeways--things she can't control. For example, in the Jim Suit there were known dangers and you could figure out what if. If you are working with good people, you are safer than driving home. In everything there is danger--weigh the risks against the gains. She does not consider herself a daredevil.

### **Attitude about working with men**

Sylvia feels there generally are no problems as long as you mind your own business, don't ask special favors, don't try to horn in on male parties, prepare to do twice the work for 'half the credit, and keep a sense of humor. She knew that she sometimes got passed over for things she could do. She felt that she understood reality. She said she would rather be where the action was rather than not be a part of it.

### **Injuries**

She has never had the bends. She watches her depth. However, once when she was studying marine growth on one of the Japanese wrecks in the Truk (now called Chuuk) Lagoon, she was stung by a lionfish. She was too deep to go directly to the surface. The photographer that was with her, Al Giddings, helped her to a decompression spot where she remained in pain for an hour.

### **Where Living**

In Oakland Hills-she has cats, dogs and horses-that is, when she is not in the Oceans of the World.

### **Dr. Earle's Family Information**

Parent Information

Father: Lewis Earle

Mother: Alice Ritchie

Father was an electrician who worked for DuPont for 28 years and then started his own business. Mother was a high school graduate trained as a practical nurse. She gave up her career to raise her children.

Both her parents were tremendously supportive when she wanted to do things that were not the norm. Parents also early instilled a love of nature. They taught respect of the natural creatures-handle gently and put back where you got them. Although there was not a lot of formal education, they realized the importance of an education and encouraged children.

After her father passed away her mother was with her and helped in many ways with the business. Her parents also helped her a lot with childcare when she was combining raising children and having a career.

### **Brothers and Sisters**

Lewis (nicknamed Skip)

Evan

Lewis was older than Sylvia and Evan younger. Evan still runs the family business, Earle Electric, started by the father.

### **Husbands**

John Taylor (1957)

Dr. Giles Mead

Graham Hawkes

Sylvia Earle always wanted a long time marital commitment and thinks that the demands of career may have contributed to divorces. She enjoys cooking at home and family. However, she couldn't turn off the curiosity that she felt towards science.

### **Children**

Elizabeth Taylor (who goes by Liz)-she works with Sylvia on her business

Richie-who is now a forest ranger

Gale-who is a website designer--lives in Washington State-has done websites for Dr. Earle.

## Timeline for Sylvia Earle

August 30, 1935	Born Gibbstown, New Jersey
1938	Moved to farm near Camden, NJ
1948	Moved to Clearwater, Florida
1955	BS Florida State University
1956	MS Duke University
1964	Trip to Indian Ocean
1966	PhD Duke University
1970	Tektite
1977	Study of Humpback Whales
1979	Jim Dive
1981	Established Deep Ocean Technologies and Deep Ocean Engineering
1985	Deep Rover dive—record solo dive
1989	Valdez oil spill examined
1990	Chief scientist NOAA
1991	Examined Persian Gulf Oil Spill
1992	Founded Deep Ocean Exploration and Research
1995	Published <i>Sea Change</i>
1996	National Geographic Explorer in Residence
1999-2003	Sustainable Sea Expeditions
2006	Talked to Google Earth people about Google Ocean
2008	Founded Deep Search Foundation
2009 (Feb)	Google ocean launched—covers in detail about 5% of ocean rest not known
2009 (Oct.)	New book: <i>The World Is Blue: How Our Fate and the Ocean's Are One</i>
July 2012	Led an expedition to NOAA's <a href="#">Aquarius underwater laboratory</a> , located off <a href="#">Key Largo</a> , Florida. The expedition, entitled "Celebrating 50 Years of Living Beneath The Sea", commemorated the fiftieth anniversary of <a href="#">Jacques Cousteau's Conshelf I</a> project and investigated <a href="#">coral reefs</a> and ocean health.
Currently	Leads <a href="#">Mission Blue</a> that inspires action to explore and protect the ocean. Mission Blue is uniting a global coalition to inspire an upwelling of public awareness, access and support for a worldwide network of marine protected areas – Hope Spots.