

"The Father of side scan sonar." Founder and former president of Klein Associates (now Klein Marine Systems). MIT graduate. Former program manager for sonar systems at E.G. & G. International where he developed the first commercially successfully side scan sonar systems. Lifelong member of the IEEE. Fellow of the Explorers Club and the Marine Technology Society (MTS). Former director of Budget and Finance for the MTS. Elected to the National Academy of Engineering. Advisory board member with the MIT Sea Grant Program and the Stellwagen Bank National Marine Sanctuary. Member of MIT Museum's Collections Committee. Judge and mentor for the MATE ROV Competition. Judge at the Massachusetts State Science Fair. Prolific author of publications and patents.



Q&A

with **Marty Klein**

Where were you born? Where is home today?

I was born in New York City. I went to college in 1958 in Boston; that's where I live today.

What is your occupation?

I'm officially retired yet so busy. I still think of myself as an electrical engineer with an interest in sonar. Someday I might actually retire.

Why did you choose this occupation?

Building things is in my blood. My family jokes that I was born with a pocket knife. I'm extremely curious about how things work. When I was a kid, my father brought me to Radio Row in NYC and bought me my first crystal radio set. I built it and took an interest in electronics, in radios. At that time, there was a new thing called a transistor – I took a fascination with that. At home I took radios apart and put them back together; turning them into intercoms among other things.

Where has your career taken you?

It has taken me everywhere. I've been so blessed. I really fell into this career by chance. When I was a student at MIT, I had to find a topic for my thesis and I wanted something that I could do using my hands. I walked into the lab of the famous scientist Harold (Doc) Edgerton and my life was changed forever. He was a friend of Jacques Cousteau; they wanted to take pictures of the deep ocean so Edgerton made a camera and strobe. He became my mentor, my professor in building ocean-related technology. Since then, I've been on every size boat from canoes to navy ships. I've been at sea in storms, with icebergs, in the middle of the Pacific, the Atlantic. I've truly been everywhere!

If you had to choose another career, what would it be?

I'm an old folkie. I love folk music. If I had a good voice, I might have been a folk singer. Or maybe a blues guitarist.

What is your personal motto?

I'm involved with the Marine Advanced

Technology Education (MATE) ROV program where I sponsor an award called the *Martin Klein MATE Mariner Award*. This is presented to an individual or team who demonstrates an appreciation for the practical applications of their knowledge and skills, and a penchant for a lifetime of interest in the field of marine science and technology. In addition to a cash scholarship, winners receive a medal that reads: "Always ask how we can do this better." This is one of my favourite sayings. I like to leave things better than they were. In any situation, I ask how can I make this better? It might be a product, a social event, whatever. I have a passion to make things better. I was a member of the Boston Computer Society when Steve Jobs announced the first Apple computer. Today I hold an iPhone in my hand and I wonder how it can be made better. I always think about being better, doing better.

What hobbies do you enjoy?

I'm very passionate about bonsai trees. I also enjoy woodworking, gardening, photography, and model railroads. I like to have something to build, to share with others.

Where do you like to vacation?

Every winter, we travel to the Caribbean, particularly Bonaire or Curaçao. Two favourite cities are San Francisco and London.

Who inspires you?

My parents, most definitely. I had a wonderful family, very encouraging. In the field, I admire the ocean pioneers: my mentor Harold Edgerton, Jacques Cousteau, George Bass, Bob Ballard, Sylvia Earle. I gained great benefits in meeting these pioneers. I grew up as an engineer with these people to look up to as heroes.

What has been the highlight of your career?

My career was making equipment to find things in the ocean. In 1967, I developed the first commercial side scan sonar. Then went to

Turkey to help find an ancient ship in 91 metres of water. Bob Ballard used my equipment to help find the *Titanic*. And I went 1,524 m below the sea in *Alvin* and did the first deep sub bottom profile. I have equipment all over the world to this day; the finds they made have changed world history.

What do you like most about working in this field?

The ocean is so challenging and making equipment that will operate in the ocean 24/7 is demanding. It is not easy to work in the ocean: rolling boats, freezing temperatures, rough seas. With over 70% of the planet being ocean, there are still things to be discovered.

What are some of the biggest challenges your job presented?

The conditions on board ships: there were no Internet, cell phones, or GPS when I started. I'd get a telegram to go to Australia with the specifics: meet the ship on this date in this place. There was no going online to book your airfare. On a boat, you can't go to a hardware store when you need something. You have to bring what you need to keep things working. And then there are the language barriers with others on board as well as interpersonal skills and conflicts. So, being on board ships brings its own set of unique challenges.

What does the future hold for those working in a marine-related field?

There are so many challenges and technologies. Today's technologists need to know everything: technology, math, geology, communications, knots, relationships, how to be seasick. There are still things to find and new technologies to be developed. When I started my career, there was excitement in ocean research: "oceans would feed the world; underwater cities would be developed." But this hasn't happened. The ocean is finite and has its challenges. Our stewardship of the planet is important: the world needs the ocean. As Sylvia Earle says,

"No blue, no green." Environmental and technical challenges remain: we don't know what we don't know.

What advice do you have for those just starting their careers?

I used to lecture and now I still give occasional talks. The basis of all my teachings is this: Don't plan to graduate. When you get your diploma or degree, that's not the end of your education – that's just the beginning. Students go to school and then start their careers. I encourage young professionals to challenge themselves to learn for their entire lives.

How can we encourage youth who choose a marine-related field?

Youth are needed for new ideas as the world has lots of problems and new approaches are needed to make things better. I encourage young people, particularly women, to get involved in an oceans-related career. When I was a student at MIT, we had eight women in my class. That's it. Today women are being encouraged to get involved in technology and in STEM careers. MATE is one of my favourite groups and it is mostly run by women. They really challenge the students. I follow some of the kids who have participated in the competition: they've gone on to be mentors themselves and to work in the ocean.

Look for what you love. Visit, travel, and learn. Go on boats, talk to people. Find your own mentors. Put yourself out there. Ask questions. Look for your passion. The world will throw obstacles at you: everyone has different abilities, economic situations, etc. And a lot of people are negative: "You can never do that," especially towards women. "You're too dumb, too poor, whatever." Don't listen to them! Take on heroes. Tune in to positive, encouraging people. Block out the negativity. Make your own path, your own ideas. Be your own person. And always, always, ask yourself how we can do this better.