Martin Jessen

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Abstract: Martin D. Jessen Jr. (1926-), often referred to as "Marty," was born in Perth Amboy to Hannah (Hughes) Jessen and Martin Jessen. He moved to Metuchen at a week old and lived with his grandparents at 343 Main Street and later at 52 Spring Street. Mr. Jessen graduated from Metuchen High School in 1944 and worked several jobs in town, including working at the Raritan Arsenal. Following graduation, he served in the Navy during World War II and returned to the military as a rescue diver during the Korean War. He graduated from Rutgers University in 1950 with a degree in civil engineering. Mr. Jessen worked in the construction business as president of Arnolt Brothers and as president of Victorian Office Rentals, a company that restores buildings for commercial use. He is married to Barbara Jane Bruner and has two children and several grandchildren.

Mr. Jessen has been an active member of the Metuchen community for almost seventy years. He was a member of the Eagle Scouts, deacon of the Dutch Reformed Church, director of the Metuchen YMCA, member of the Metuchen Planning Board, chairman of the Metuchen Savings and Loan, former chairman of the Metuchen Historical Commission, and president of the Metuchen Rotary Club and the Metuchen Chamber of Commerce. He also served as chairman of the Metuchen Country Fair, an annual fair along Main Street that began in 1964 as part of the 300th anniversary of New Jersey. He also has written a short stories column in the *Criterion* and an autobiography titled *Marty's Musings*.

The following transcription is from a presentation by Martin Jessen about rescue diving and salvage for the Metuchen-Edison Historical Society. As a former rescue diver himself, Mr. Jessen recounts the story of the sinking of the USS *Squalus* (SS-192) submarine and the subsequent rescue and salvage in 1939. His presentation also includes a demonstration of the diver's equipment used during the rescue of the thirty-three people. At the end of the presentation, he discusses the Mark 14 torpedo issues and the sinking of the USS *Sculpin* (SS-191) in the Pacific during World War II.

Interview note: Audience members during this presentation cannot be accurately identified. Therefore, these individuals will be generically identified as "Audience 1," "Audience 2," and so forth.

P. Boeddinghaus: [recording begins mid-sentence] … a program given by Martin Jessen of Metuchen, New Jersey for the Metuchen-Edison Historical Society on April 12, 1996. And he is our program for this evening. [recording paused]

M. Jessen: **Thank you. It's a sad thing about the state of the [Metuchen] Historical Commission for they're being punished for being too bureaucratic a bureaucracy. As an example, the Royal Governor's Palace, the Proprietary House[1] down there, they're trying to get the inside of the building painted for about fifteen years now. And they've had to do one study after another because the bureaucracy in Trenton wants to employ these specialists that they have there, consultants and everything. And they have spent probably around $15,000 so far. [They] haven't got the permission to paint it yet. It's probably a $10,000 paint job. And the [unclear] bureaucracy still churning out all of these directors and everything like that and nothing happens. And I think that's what has happened to the [unclear] job; unfortunately, good get punished with the bad. And that's the sad part about it.**

I had always been told it was going to be twenty-five people here tonight. Just a few more. So I get the shirt? We're talking about the AARP [American Association of Retired Persons] and they have a [unclear] sent around in town; I read it every once in a while. And they had a story in there about the America's Cup [sailing] race. You remember the America's Cup race down in Australia a few years ago? And it was an Italian boat that entered into it and it was sponsored by Gucci. I don't know how many of you know it, but Gucci [fashion brand] makes things for ladies. [audience laughter] And they're very expensive. And they had six of their executives down there to watch the America's Cup and make sure all their advertising got out properly. And each of them wore a $2,500 Gucci jacket in honor of the America's Cup race. And they went to the race and they lost it, and they were going to come home pretty soon and they hadn't seen any kangaroos. So they went around and talked to the Australians and said, "We want to see a kangaroo." So the Australians [said], "Well, there aren't any around here. You got to go in the Outback[2] and get away from civilization. And that's where the kangaroos are." So they rented a Land Rover [vehicle] and then there, six of them in their Gucci jackets, got in the Land Rover and took off into the Outback. They're driving down this back dirt road and they hadn't seen a sign of civilization for about ten miles, and with that, a kangaroo jumps out of the bush and <u>bang</u>! They hit it with the Land Rover. The kangaroo is laying down there. So they all get out and look at it and they decide to take some pictures. And somebody said, "Let's take a picture of the kangaroo with a Gucci jacket on." [audience laughter] So the lone man on the totem pole is the driver, so he takes off his Gucci jacket and they prop up this kangaroo and they get the jacket on him and they button it up. And with that, the kangaroo comes back to life and goes hopping over the bush. [audience laughter] And you got to picture this kangaroo hopping around Australia with a Gucci jacket and the keys to the Land Rover in his pocket! [audience laughter]

[1] The Proprietary House in Perth Amboy is the last-standing proprietary governor's mansion from the original Thirteen Colonies. Completed in 1764, the Georgian-style mansion was designed by architect John Edward Pryor and was first occupied by Chief Justice Frederick Smyth. In 1773, the mansion was repaired and converted to the residence of the royal governor of New Jersey and it was leased by the proprietors.

[2] The Outback refers to the vast and remote interior of Australia.

So I'd like to talk about the sinking and the salvage of the submarine *Squalus*[3]. And just for a little review, we're talking about a submarine that was the classic U-boat of World War II. The first models came out in late 1930s. And the submarine is basically a series of tanks and compartments end to end. And you look at the diagram and around that are a whole series of tanks, and these tanks are air tanks, ballast tanks, fuel tanks, water tanks. That whole inner hub is surrounded by tanks. And around those tanks is the hull that you see when you look at–go up and see a submarine. Now a submarine submerges by flooding its ballast tanks and taking on enough sea water so it eventually sinks. And once it floods and it goes underwater, it has to be neutral. In other words, it has to weigh zero. If it weighs more than the water displaces, it starts to sink. And if it weighs less than the water displaces, it starts to rise.

So I don't know how many of you are scuba divers, but you find out it's very difficult to maintain yourself underwater without rising or sinking. Well, the submarine solves this problem by moving through the water. And they move through the water with diving planes on the stern. And as long as they have forward motion, they can be a little bit off on their negative or their positive buoyancy and still maintain their depth. Now the problem is, when the destroyers get in in the afternoon, and they have to stop, they have a very difficult time standing still. So in the movies, you saw them going down to the bottom and laying on the bottom and everything, but you are in the Pacific Ocean and the bottom is 5,000 or 6,000 feet down, that lets that out. But we'll get to that in a minute.

Well, let's talk about May 23, 1939. And just so you get a picture of where we are, King George the [Sixth] and Queen Elizabeth [The Queen Mother] met the Dionne quintuplets in Quebec [Canada]. And now that's the present Queen's [Queen Elizabeth II's] mother and father we're talking about. United Airlines just started their new service to Chicago, four and a half hours non-stop. Joe DiMaggio was a [baseball] centerfielder for the New York Yankees; that's before he sold coffee pots. Rudy Vallée was at the [Hotel] Astor Roof on Times Square [in New York]. And it was a new English actor Laurence Oliver in *Wuthering Heights,* [actress] Katharine Hepburn was in *The Philadelphia Story,* and Japan was romping through China, and Germany and Italy signed a ten-year pact. And that same day, the submarine *Squalus* No. 192 left Portsmouth [New Hampshire] on one of its shakedown cruises. It had a crew onboard, it had the officers onboard, it had three civilians onboard, who represented the [Portsmouth] Navy Yard that built it. The submarine goes on the surface by using diesel engines. And diesel engines take air and it breathes this air through a thirty-one-inch pipe that runs up into the conning tower. You got to picture a pipe yea big around. [gesturing to size] When you want to dive, you close all of the hull fittings in the submarine and you flood the ballast tanks and it sinks. And the last one to close is the hull fitting that takes the fresh air in from the diesel engine, and that's closed with a gate valve that slides right straight across and is pushed in hydraulically.

[3] USS (United States Ship) *Squalus* (SS-192) was a diesel-electric submarine that suffered a catastrophic valve failure during test dives off the Isle of Shoals near the coast of New Hampshire on May 23, 1939. Partially flooded, the sinking drowned twenty-six crew members, but a rescue operation using the McCann Rescue Chamber saved the remaining thirty-three people aboard. The submarine was salvaged in late 1939 and was recommissioned as the USS *Sailfish* in May 1940. During World War II, the submarine conducted several patrols in the Pacific War and earned nine battle stars.

And it's backed up with another valve where you turn the crank and closes it. Unfortunately, it takes a hundred turns of that crank to close that second valve.

The submarines were going to do what we call a crash dive[4] today. They were [to] be going at fourteen knots on the surface and they were going to see how fast they could dive down and maintain their trim and everything. But the first thing they do is that they open up the Kingston valves, which are the big valves on the bottom of the ballast tanks. And the top of the ballast tanks is closed so you are riding on the air-relief valves on the top. When the commander dive, those valves are opened and the sea water starts to flood into the ballast tanks, the submarine starts down, the diving planes are filtered down, and this main induction valve is closed. Now in this control room of the submarine, there's a control board called a Christmas Tree, which has red lights on it and green lights on it. So it gets the name Christmas Tree. And when the lights are red when it's open, and the green when all the hull closings are closed. And there's probably about fifty different openings that are shown on that valve. So as they are watching this, they see the Christmas Tree turning from red to green, and they know that all of the hull openings are closed. Then just to double-check it, they bleed air into the boat and read the barometer. If the barometer goes up, the boat must be airtight, which is what they did. They got down about forty feet and suddenly the call came back from the after engine room, "We're flooding! We're flooding! We're flooding!" And with that, the command was given, "Blow all valves!" To do that, they open up valves from high-pressure air banks and put air into these ballast tanks, which blows the water out through the Kingston valves at the bottom. That should bring the submarine up. It started to come up, and it got up to just about near the surface and it was on about a forty-degree angle. And then because the after end was flooding, it started to slide back.

Now see seven men came forward from the after battery room. If you look on your diagram there, and you'll see a door that's going very close. Now that door is about thirty-six inches high and about eighteen inches wide and it's an elliptical-shaped door and it's about yea far off the deck. So you got to kind of step through it and work your way through it. And a guy by the name of [Electrician's Mate Lloyd] Maness reached through and pulled that door closed just as the water started to come up over the [unclear]. So the sub shuttered, stopped rising, and it slid back down to the ocean floor and it hit the bottom. The lights went out. An electrician ran down into the battery room. Now you look on your diagram, you'll see you have an after battery room and a forward battery room. Why do we have batteries? When you are on the surface, the submarine drives the–these linches drive the screws, but they also drive generators, which charge these batteries and they're DC [direct current] batteries and they are about–they vary in height, but most of them are about six feet high. You got a picture a battery yea high; they're sulfuric acid and lead inside of them. They're very heavy and they are in the bottom of the boat. So somebody (a cheap electrician) dropped down into the battery room underneath the floor, crawled on his belly, and pulled the main switches. [coughing] When he did, it was [unclear] dark, now a [unclear] that's eight inches, that's a good shot of amps. The first thing they worry about is chlorine gas. And why they worry about chlorine gas is because of the sulfuric acid in the batteries, and if salt water gets on it, the two react and they make chlorine gas. [coughing] There was no chlorine

[4] A "crash" dive is defined as the rapid submersion of a vessel in order to avoid enemy detection.

gas. They took a muster and they found that thirty-three men were in the forward part of the boat. And twenty-six men were aft. And they hadn't heard anything from those people aft, only the words that "it's flooding, it's flooding."

So now they are on the bottom, what are they going to do? Who's going to find them? Well when they go, they need a report on when they were going to dive and when they were going to come back up. So they would be missed eventually. But previous subs said some, and there were certain safety devices on this one, and the first one was the ability to send up a buoy with a telephone in it. So they released a buoy from the forward torpedo room and that floated up to the surface. And it said on the buoy, "Submarine sunk here. Call inside."

Audience 1: Nineteen what? 1933?

M. Jessen: **Nineteen-hundred-thirty-nine. The second thing they can do is send up smoke rockets. So they started sending up smoke rockets about every fifteen minutes. [coughing] After the time that was up for them to surface, and they hadn't reported, the Naval authorities contacted submarine *Sculpin* [SS-191], which was the sister ship of the *Squalus* which was leaving Newport [Rhode Island] at that time, and told them to go and search the area. And they searched the area and they spotted the smoke rocket [red smoke bomb]. And they went alongside, found the [telephone marker] buoy, picked up the phone, and heard that there were survivors down below, and that everybody was all right, and that they were in 240 feet of water. And then the wire broke.**

So the word went out, "We have a sunken submarine." The Navy Yard in Washington put six divers on a plane and started them up towards Newport and the submarine rescue ship *Falcon* [AM-28] got underway to go to the sea. Now the *Falcon* was an old minesweeper from World War I and it was a steam-driven ship. And it was set up for submarine rescue and it had a decompression chamber on it where divers that go into deep sea diving–and it had a McCann Rescue Chamber by it. You look at the back of that picture, you see a picture of McCann Rescue Chamber. So while this *Falcon* was approaching there, a Navy tug came and started to drag the area. Now they had a grapnel and you're dragging in 240 feet of water, you might have 1,000 feet of line now, and you had to go back and forth like you're cutting your lawn till it catches on something. And after about four hours of dragging, it caught on something. So they put a buoy on it and they waited for the *Falcon* to arrive. Three a.m. the next morning, the *Falcon* arrived and the *Squalus* had been down on the bottom since eight-thirty [a.m.] already. And the *Falcon* had to make a four-point [unclear]. Now in order to send divers down to the submarine, you can't have the mother ship swinging on an anchor. You got to anchor permanently, so you have to put anchors out to four points of the compass. And in 240 feet of water, that's hard because you got to steam out and looks place the bank is going to go, you have to pay out the line, and you got to go over here, and then you got to go back over–and this was before they had global positioning or anything else like that. You had to do it all by smarts. But they finally got all their anchors down, and they were ready to send the diver down.

Now, the diver. You see a picture of the diver there? [gesturing to image] And let's imagine we are all divers, all right? And we are going to go down in 240 feet of water. Well, first thing we do is take our clothes off and we put on three suits

of long underwear. It's long black, navy underwear. It comes with bottoms and tops and long sleeves. And that's to keep you warm because the water temperature down there is about thirty-three degrees. Then we'll put you into the diving suit and that's a big canvas of rubberized suit and it looks like a kid's sleeping suit, if you know what I mean? It goes down, and in cold water like this, in warm water, it has a cuff on your wrist and your hand sticks out. In cold water, it ends in a glove and it's a three-finger glove. So you are in this suit and you got this glove. Now this three-finger glove, you can't do too much with it; it's kind of tough to move. So then the next thing they do is, you'll sit down on a little bench and guys will come up to you and they'll take this lower part of the helmet called a breastplate and they'll fit that into your diving suit and it's bolted fast.

[Mr. Jessen shows a quick demonstration of the equipment] These brass brackets come off, and the suit goes in there, and then they're screwed back down and tightened with a heavy wrench. Now you are sitting there, you got the breastplate on, then they'll put your feet in your shoes, and the shoes are lead-soled shoes, and together they weigh thirty-five pounds and they're laced up. Then the next thing they'll do, they'll lace the suit on the back of your legs, and that's so that if you fall down head first and your legs go up, they don't fill up with air and get you so you are out of control. So you got to have your legs laced up tight. Then they'll take an eighty-five-pound lead belt and they strap that around your waist and that hangs from straps or suspenders over your arms here. So you got that hanging on your belt. Now you're sitting there, next they bolt the airline onto your–they tie an air hose onto the front of your belt and there's a valve down here where you can grab it with your hand. Then they'll check everything out and the tethers will go and everything. And then they'll take this helmet and they'll put it on you. And you'll have this little port is open, that's where you're sinking, you get to have a block it in, and they'll check the telephone, make sure it's all right. And they'll say, "You ready to go?" And you'll say, "Yes." So they'll screw this in tight, tap you twice on the head, and you stand up. Now if you're lucky, you'll have a stage. And in this picture, you'll see the guy standing on the stage. So they'll be a helper on each side of you and you'll lumber over to the stage. [Mr. Jessen starts walking with the demonstration equipment] You get there and you grab hold of it, and they tell on the telephone, "You ready?" You say, "Okay, ready." And the wind starts going, the stage hoists you up in the air, and you are swinging there like this. And by this time, all this weight is hanging on your shoulders and everything, and you're about dead, all right? And then suddenly they start lowering your water, and you say, "Thank God!" Because as you get in the water, the air in your suit starts to pull the weight of all this on you. And you get down underwater there and the weight is off you again. "Oh boy, that's great now."

So now you've checked everything, make sure there's no leaks or anything, and you feel all right. Now you open up your air valve, put a little air into it. And what you want to do, you get this breastplate here starts to push down on your chest, and you just get enough air into it so you lift it off your chest and you don't feel it there, all right? So you say, "Okay, I'm ready." So then they drag you over to the descending line, and the descending line was the drag line, the tug boat they hooked on the *Squalus*, but we really don't know. So they say, "Okay, I'm ready to go down."

[Mr. Jessen shows another quick demonstration of the equipment] So now you grab hold of the descending line with one hand and your control valve with the other and you start to drop. And you want to drop as fast as you can because your time on the bottom is limited. And the time starts from when you leave the surface. So if you can only spend twenty minutes on the bottom and you spend fifteen minutes getting there, that doesn't help very much. So you drop as fast as you can. As you are going down, the water pressure is increasing on you every thirty-three feet if the pressure doubles. For quick thinking, figure about half a pound per foot. So at 240 feet, you're going to have about 120 pounds on you. So as you are going down, you feel this breastplate pushing in on you. You keep giving a little more air, a little more air, and you don't want to give it too much air because if you give it too much air, the suit starts to blow up. If it bloats up too much, your hands go out and you can't touch anything. Now you are in trouble. You got one thing you can do, there is an exhaust valve here, and you can hit it with your chin. If you hit down with your chin, it will let the air out and that might be enough. But if it isn't, you're going to start up. Now when you start up, the air that's in your suit, it may be sixty pounds, you go up ten feet, "Hey, water pressure is five pounds less." Now that pressure suit is greater, now you're stuck and you'll pop right up to the surface. And you'll hope you don't hit the bottom of the salvage ship or anything else. And you'll hope that somebody will get out there and shut your air off before the suit explodes on you. So you're very careful about your air pressure that you don't get too much on, just enough.

So the diver slid down the descending line, and he gets to where it is at the bottom, and thank the Lord, it was on the submarine. And it was right by the escape hatch. And if you look at the picture there of a guy coming out, that's the escape hatch and that's a fellow with a Momsen Lung[5]. [showing an image] And then we have to talk about Mr. [Charles B.] Momsen. In the twenties and the early thirties, there were two submarines sunk, both of them ran by ships, and both of them sunk with men aboard and they couldn't get them back. And one of them, it took the guys three days to dive. You can imagine the people on the surface not being able to do anything and hear these fellows down below trapped in the submarine banging on the walls asking for help and not being able to do it. So Momsen was assigned the job of doing something about it. And the first idea he came up was with the Momsen Lung. And today with scuba diving and everything, we don't think too much about this. But this was back in the thirties, this was quite afield.

Inside the submarine in the forward torpedo room and the after torpedo room, there's a trunk that comes down from the overhead and it comes down within about four feet of the deck. And there's two hatches inside that trunk: a lower hatch and an upper hatch. And if you were in a sunken submarine or if you were going to become a submariner and you were in the submarine tower at New London [Connecticut] or at Pearl Harbor [Hawaii] where they had a 110-foot columns of water that you practice in–and that's what I did, I went in one of those. You go into this small room which represents the torpedo room and you got your Momsen Lung, and you take that bag and you go over to an oxygen flask and you bleed oxygen into it. Then when everybody has got their one mode

[5] The Momsen Lung was an early underwater breathing apparatus that could operate at extreme depths. This device, which consisted of a rubber bag that recycled exhaled air, allowed divers or submariners to rise slowly and safely to surface.

loaded with oxygen, you have a clamp that fits on your nose, and the guy in charge says, "Everybody ready?" They say, "Yeah." And they open the valve and water starts coming in. And you're standing there and the water comes over your ankles and comes over your–it's up to here and it gets over the bottom of the trunk and it keeps coming in because it's got to compress the air inside the torpedo room until it equals the air pressure of the water outside. So it usually gets in the butt up to here. [gesturing to size] Now there's six other guys in there with you and you're scared, but you don't want to show it to them. You know how young guys are like [unclear]. Finally, the first guy, the strongest swimmer, he goes in first and he opens up the bottom hatch and he opens up the top hatch. And now because the pressure is the same inside as it is outside, everything's in static condition. And he ducks down underneath this pipe and he goes up, and the first guy takes a rope up with him. And the rope has got knots in it, every point B. So then as you go up, you side up till you get to the first knot, and you hang on to it and you count to ten. And you're breathing in and out of this bag of air [unclear] and you go up to the next one until you get to the surface. Now they didn't have a problem with the bends[6] in this because we were only exposed to the high pressure for maybe ten minutes or so at most. So that's the way people escaped from submarines. Well that's all well and good, but in cold water, I don't know whether you last coming up from 200 feet. In thirty-two-degree water, you know with an exposure suit on and everything, you know you could probably go. But a normal guy, I don't think you make halfway up before you be out in the cold. So had to come up with something else, and he had come up with the McCann Rescue Chamber[7].

The McCann Rescue Chamber is nothing but an upside down–think of it as a glass [unclear] upside down and you lower that down to the submarine and the people get in it, you bring them back up. The problem is how do you get to hit the submarine with a crane hanging over the side of the salvage ship? And we're rocking in the waves here, and how are we going to lead that thing down 240 feet to hit that little hatch? Well, Momsen came up with the idea: "We'll put a cable down on that hatch, and we'll attach it to the rescue chamber, and we'll let the rescue chamber pull itself down to the submarine. That way we'll hit the hatch every time." So [Boatswain's Mate Martin] Sibitsky is down on the submarine and he finds that he is in the forward part and he is right by the ax to the forward torpedo room. And he says, "I'm on the forward torpedo room. Send me down the downhaul wire." So they take the wire, a steel cable, and they put a shackle on it, shackle it to the descending line, and they start lowering it down. So meanwhile, he's walking around and he sees the telephone wire is laying across the hatch. And with that there, you're not going to be able to make a seal with

[6] "The bends" refers to decompression sickness when a diver ascends too rapidly to the surface. When a diver ascends too quickly, nitrogen in the blood forms bubbles that can block blood flow and cause intense pain or even death.

[7] Due to several accidents in which Naval submarines sank with loss of life during the early twentieth century, Charles Bowers Momsen proposed the idea of a diving bell as a way to rescue survivors from sunken submarines. Overseen by Lieutenant Commander Allan Rockwell McCann, the men were able to develop a submarine rescue chamber that could be lowered from the surface to attach with the sunken submarine's escape hatch. The prototype was completed in late 1930 and was known as the McCann Submarine Rescue Chamber. The final design was safe and large enough to hold up to eight rescued crewmen and two operators. The McCann Rescue Chamber was first used to successfully rescue thirty-three survivors from the submarine *Squalus* in a total of four dives over thirteen hours. McCann was in charge of the chamber operations and Momsen commanded the dives.

your chamber coming down. So he's got to pick it up. Well, in a diving suit, he can't bend down to pick it up because you got all this underwear on and here and the 885-pound belt and everything, you don't bend. So you got to lean over to do it. Well, inside here you have a chin valve, and that's an exhaust valve. So you're standing there, you take your chin and you help the chin guy and the air starts bleeding out of your helmet. And you lean forward, and you'll just go right down like this and you grab hold of the wire. And then you take your mouth and you grab hold of the chin valve and you pull it in with your mouth and that starts the air back into your hatch. And boy, you come right back up again.

So anyway, Sibitsky gets the descending line, in the downhaul line coming, he shackles it to the side of the hatch and we're ready to go. Oh, the water was twenty-nine degrees; [it] was fifty-four visibility on the bottom. It took them only three minutes to get down there to the *Squalus*. The two operators operated the McCann Rescue Chamber and one of them was John Mihalowski, the torpedoman second class, and the other was Walter Harman. Now somebody asked me, "Why would a torpedoman be a deep sea diver?" We had torpedoes and a torpedo was–you know what a torpedo [is], you've seen it. Well, every torpedo had a little steam turbine inside of it and it had two propellers on the back going in opposite directions. Why did they go in opposite directions? If you only had one torpedo, one propeller, you get too much torque and the torpedo would spin. You have two propellers going in opposite directions. And these things cost about $2,000 apiece. Well, that was a lot of money in–you could get four Ford cars for that price. So when the Navy sent out torpedoes to practice, they tried to get them back and deep sea divers would go to get them back. Now they were rigged so that when they reached the end of their run, they were supposed to pop up to the surface. But they all climatized; they didn't do that. But sometimes they ran deep and they stuck in the mud [unclear]. So you had to send a deep sea diver down to do it. And that was always exciting because this torpedo is still alive. It's still got pressure inside the steam turbine and you can't trust them. So you had a bracket that had four prongs on it, and you go down and you find the torpedo and usually you'd be sticking down in the mud. You take this bracket and you kind of sneak up on it. You stick it on real quick, if you want. Nine times out of ten, you jam that on and the propellers would start to turn, but those prongs would catch them, you'd be all right. Then you go dig the nose out, and there was an eyeball [unclear], put a cable on and haul it up. That's why [unclear] torpedo.

Anyway, the two men got in the chamber here and it's over the side, it's bolt in the water, they close the hatch, and then they flood their ballast tanks until they have slightly positive buoyancy so that they are floating with maybe a hundred pounds of pull going up. And then they start reeling in the cable on the bottom. The cable churns their way down and they go right down to the submarine. They got to the submarine and then with the cable pulling them down under the big rubber gasket that goes around it, and they put compressed air into the lower part of that and blow the water out. Then they bleed that back out and then they've got all of the weight of the ocean shoving this suction cup down on top of the submarine. So they're in pretty good shape there. So then they go down into the chamber and they have four bolts that they bolt themselves fast to the submarine, they wrap on the hatch, and they open it, couple buckets of water goes in, and they're ready to start taking people out. Now this was the first time that this had been used in an actual rescue. And it was eight p.m. so they had

been down there about a day and half by the time they had got this [unclear]. Normally, there's two operators and seven men. So the first trip up, they brought seven men up and they brought the civilians up, and they brought up one officer so he could tell what was going on, and the guys who appeared to be the weakest. When the [McCann] Submarine Rescue Chamber was down there, they pumped fresh air into the submarine so they could freshen the air up that was in there and bring more oxygen down to it. And they also brought down a seal to absorb it, which would soak up the CO2 [carbon dioxide] that was in the air.

They decided to increase the number of men on the next trips from seven to nine. And this turned out to be a very important decision. They got all the way up to the fourth trip and they were taking the last men out of the submarine and they started up. And they got to 155 feet and it stalled. Wow! So they wound their way back down again and they came up again 155 feet and they stalled. And they looked down in through the eye port and they could see that the cable had started to unravel and it was jammed on the winch. And there they were stuck halfway up and halfway down. They didn't know what to do. So it was decided to lower them down to the ocean floor. So they lowered them down to the ocean floor and they had to cut the descending line because that was what [was] holding them to the submarine. So they sent a diver down and he had a pair of big bolt cutters and he got down there and he found the descending line and he cut it. And now they're ready to haul them up.

So on the top of the chamber was a preventer, which was a half-inch cable that went down to an eye on the top of the cable. So they put that onto a winch and somebody says, "Haul away." And the winch starts turning and the cables coming over the side of the *Falcon* and all of a sudden it starts to unravel. And they yell, "Stop!" And they have one string end of the cable left holding the chamber back. So they lowered them back down to the bottom. Now you got to picture these guys have been on a wrecked submarine for a day and a half and now they are getting rescued and now they are in a rescue chamber and suddenly they are stuck on the bottom. What are they going to do? So they send a diver down to shackle a new preventer line to the top of the chamber. And he gets down there, and you have to picture that chamber, it's got a round top, all right? And you're the diver and you land down alongside of it; you got this cable in your hand and you can't bend over. Remember I told you, I said trying to float on down and the guy had a terrible time. He couldn't do it; he couldn't get it on. They sent a second diver down and he couldn't shackle it on either. Now they are getting worried. And this is where the Admiral in charge earned his money. He said, "We're going to pull them up by hand." How are we going to do it? "Well, tell them to blow the ballast on it for thirty seconds." So they blew the ballast for thirty seconds, took out a side, figure out how much that one strand would handle. And he said, "Put six men on it, give it a pull." And they put six men on it and they pulled, didn't do it. Said, "Blow ballast for fifteen seconds more." They blew fifteen seconds more ballast, [unclear] don't pull, didn't move. "Blow it fifteen seconds more!" They did that, six men got on it and it started to come. It started to come up. And hand over hand, they pulled it in just with six men. At the fifty-four level, they passed one of the divers who was decompressing and he's there, he's getting a decompression watching this chamber go up faster. And then the broken part came across the board and the twelve men in the chamber came up and they're all rescued.

Now came a political problem. Everybody was sure the after end of the submarine was flooded, but they had to go down there and see. Now going down to the forward end, you knew there was air inside it. You knew there was people inside it, you knew what the air pressure was inside the submarine. They knew everything. Now they had to go down to the after end that was flooded and at that point, they didn't have this pressure of the ocean to hold them down under the submarine. All they had was the strain on that cable, so they put a new cable on actually and two men got into the chamber. Meanwhile, the divers put a new downhaul wire on the after end of the submarine, on the after torpedo room, and they wound their way down to the submarine. And they got down there and they blew the water out of the skirt and they bolted themselves fast. Now they got to build the pressure up, so they started building the pressure up in the rescue chamber and that's why they had divers running it. And they got it up to the depth of the bottom and then to check it, they opened the [unclear] in the middle of the chamber. And a little bit of water squirted in, so they [unclear] gave a little bit more pressure until the water didn't squirt in; it's balanced. So they went down in and they opened up the hatch and they didn't study their physics because it was balanced for the pressure way up there. This guy is standing on the hatch way down here. Well luckily, the operator saw the hatch pulling up and the water started to pour in, so he opened up the valve real quick and the *Falcon*'s compressors are banging the air down there. And the guy got the water up to here before the air took over and gradually blew it back down. So then they blew the air down into the submarine and when they looked down in there, there was nothing but water. So they knew everybody there was dead. They closed the hatch again and they came back up to the surface.

So the rescue was over and now was time to salvage it. And very briefly, if you look at the diagram there, you can see how they did it. They put the battleship underneath the submarine. Now battleship anchor chains, the links are yea big around and they are made with a two-and-a-half-inch barb that's bent into the surface. It's called a two-and-a-half chain because that's the diameter of the bar that made the length. And those chains have to be brought underneath the submarine and that's done by divers digging that out with a jet, a fire hose, and that brings up another problem. First time they tried it on the *S-51*[8], they sent a diver down with a fire hose. And they're standing there and they turned it on, the next thing you know he's flying back because for every action there is an opposite equal reaction. So they made a nozzle that looked like a big fire nozzle and it had holes in the back of it so just as much water shot out of the back as shot out forward. It was negative pressure in each direction, and that's what they use to dig underwater. That was called a Falcon nozzle. And they were hard to get. And I had one of them, and I kept it under my bunk. I wouldn't let anybody take that away from me. [audience chuckling] But anyway, also the advantage of that nozzle was, because the water was going forward and also going backwards, it would wash out the hole as you were digging it.

[8]On September 25, 1925, the USS *S-51* submarine sunk near Block Island off the coast of Rhode Island in a collision with a merchant steamer resulting in the death of thirty-three sailors. The salvage operations for the sunken submarine were both treacherous and arduous with the submarine eventually being raised on June 5, 1926. The sinking did result in the advancement of diving and rescue techniques, which led to the first use of the McCann Rescue Chamber in the sinking of the *Squalus.*

So on this salvage operation, they developed a lance [phonetic], which was a series of pipes that fit together so the diver could actually stand on the deck of the submarine and work this nozzle down underneath to dig the clay out and everything and get the chain. You get the chains rigged underneath there and then they put the pontoons on which was quite a job too because the pontoons were tough to handle and they're divided into three sections, three chambers, and you have to think, well, free surface. And this is the bane of all trip salvage people and all sailors. Free surface is you walking across the kitchen floor with a dishpan full of water. You know how it sloshes from side to side? Well, now picture a ship or a pontoon like that with twenty tons of water sloshing back and forth. You can see the problem you have. So they solved that by designing the chamber so that the–with the center one empty and the side ones flooded, it had a slight negative buoyancy and they could lower mechanically down to the bottom. So you would lower all of these down to the bottom, get all the chains hooked up and everything, and you can see it's quite an operation to get them all rigged in such a way that when they put air into them, they're all going to be in the proper place. They did that and they started the salvage operation. And you probably all saw the picture, they got it halfway up and free surface came in and some of it was inside the submarine and it sloshed to the back of the submarine. The bow came up and the *Squalus* shot up out of the water. You saw that famous picture of the 192 sticking out, slid out of the cradle of chains and there it is, and it came back down. There's a picture of it. So they had to go through the whole operation all over again. And the next time they got it right and they brought it in. What you do, you bring it up and maybe you'll get it up fifty or sixty feet off the bottom and then you drag in toward shore till it grounds. Then you lower all the pontoons down, tighten up on the chains, and then pick them up again. And you do a series of lifts, you get in the shallow water, and you can bring it up.

It was brought in the shipyard and it was found that there was probably a failure of the hydraulic system[9]. The backup system with the little wheel to turn took all of two minutes to turn, which is–they changed that design too. But it was a mechanical failure and that was the problem. So they took the *Squalus* and they fixed it up and patched it up and restored it and it became the *Sailfish*. And it no sooner got that done then WWII [World War II] got started and we needed all our submarines. And the *Squalus* and the *Sculpin*, its sister ship, went to the Pacific. And there they went through the torpedo–you hear about the torpedo bombs?

You know bureaucracy is great. The problem with all bureaucracies, governments, businesses, everything like that, is the decision makers are too far away from the problem. When World War II started, American submarines were firing torpedoes at Japanese targets. And strangely enough, when they had a bad shot, when they caught them on an angle either going away or coming to them, the torpedoes would explode. They had a dead end shot into the side, they didn't explode. That was one problem. The second problem was it ran too deep. They'd set it for eighteen feet, the torpedo would go thirty-six feet. Well, if that problem was solved by going to Australia, and they went and stretched fishnets across the harbor entrance and fired torpedoes through the fishnets and

[9] The flooding of the *Squalus* was caused by "a mechanical failure in the operating gear of the engine induction valve." A new valve design replaced the defective part which made later submarines safer for their sailors, who would help win the war in the Pacific during World War II.

measured how far down the hole was. And they found out that they were running just about twice the depth they were set for. So they sent that letter in to Bureau of Ships [Bureau of Ordnance] and told him they had a problem and Bureau of Ships answered, "Your tests were done improperly." [audience laughter] But luckily for us, all the submarine commanders talked to each other and they all knew–sent their torpedo [unclear]. The second problem was harder to figure out. How could this be? And they note–all the Bureau of Ships kept saying is "you submarine shippers are a bunch of crybabies. You don't know how to run your damn submarines. And you screwed up. There's nothing wrong with the torpedo." So what they did was one submarine caught the biggest ship in the world at that time, which happened to be a Japanese whaler, which had been turned into an oil tanker. And it was going away from the sub and they got a shot at it and they knocked the screws off of it. So they came up and surfaced and they got right opposite the center of the ship and they fired four torpedoes, one at a time into the side of the ship. [coughing] And they took movies of it. And in the movie, you can see the torpedo going in, hitting the ship, and bouncing up. Then they sunk the ship with shell fire. Then they went back to Pearl Harbor and they showed them the movies. And finally, they believed there was something wrong with the [Mark 14] torpedo[10]. So they spent months trying to find out why these exploders, the triggering mechanism, wouldn't work. And very simply, as the torpedo was going this way and it hit, the firing pin went this way to fire. And when you hit something on an angle, it worked. When you hit something dead on, the impact created so much friction that the firing pin wouldn't fire hard enough to explode the detonator. And it didn't work. Once they found out what was wrong, I think they went to an aluminum firing pin and that straightened out–now that's how so many torpedoes started working.

Now an interesting sideline to that, in the Battle of Midway–remember that? Four Japanese carriers got sunk. The last one to get sunk was the *Akagi* and on that was the chief [unclear] bait of the ship. The ship's burned and he's going over the side and he gets over the side and he's on the blister. The blister is where the armor belt was on a Japanese [unclear]; it was about two feet wide and it's standing there. The ship is on fire behind him, he's going to go overboard pretty soon. The Japs didn't have a lot of lifejackets and suddenly he looks up and there's a torpedo coming right for him. And it hits right under his feet, but luckily for him, it was an American torpedo. [audience laughter] It bounced back out, broke in two, and two of the air flasks came out. He jumped overboard, grabbed the air flask, and he was saved. [audience laughter]

So now there's another problem. There was another good thing that happened to us there, the Japs brought–we [Americans] could only go to 300 feet so their depth charges [anti-submarine warfare weapon] went off in 300 feet or less. So all the American submarines had to do to get away from was to go down below 300 feet, they're home free. Well, that only lasted about six months because some idiot in the Navy Department told the Congress. And the Congressmen had a news conference telling the newspapers that "guess what? We don't have to worry about the Jap depth charges because they get less than 300 feet, we go

[10] The Mark 14 torpedo was the United States Navy's standard submarine-launched anti-ship torpedo of World War II. This weapon was plagued with many problems that crippled its performance early in the war. The Mark 14 played a major role in the devastating blow U.S. Navy submarines dealt to the Japanese naval and merchant marine forces during the Pacific War.

below 300, we're home free! Besides they don't make a very big bang anyway." Well, they had 300-ground depth charges. Well, you know them Japs aren't too dumb. They got a copy of the *Honolulu Advertiser* that has this story in it and they know how–I guess they didn't have a bureaucracy then because within weeks, they had 600-pound depth charges that would go off at any depth. And we lost a lot of people and a lot of submarines because that Congressman wanted to make a few points with the press. So things haven't changed too much, have they? [audience agreement]

Well anyway, the *Sailfish* and the *Sculpin* both had very successful tours of duty in the Pacific War. And in November 1943, the *Sculpin* was out there and it had a new skipper onboard and somebody in the Navy Department did a very dumb thing. They sent a Captain [John P.] Cromwell onboard as the wolfpack leader. They started German [unclear] with the wolfpacks; we were going to try the wolfpack[11]. The bad thing about it was Captain Cromwell knew about Ultra. Remember about Ultra? The German coding machine that we got ahold of and the Japanese used the same thing and we read all of their codes and they didn't know it. Well, he knew all about it. So they are out there and they see a convoy and the convoy is going away from them so they service the night. And they got ahead of the convoy and they took a shot at it and they missed. And the Japanese came in and depth charged them and they just stayed quiet on the bottom, didn't make too much noise. And they were down for about eight hours and they surfaced. Guess what? They came up and there was a Japanese destroyer [named *Yamagumo*] waiting for them. And he dropped fifty-three depth charges on them and they went all the way down to 700 feet. And finally, they were leaking and they were taking on water. They lost their propellers because their shafts got bent and they had to blow all the ballast and come up to the top. And they came up to the top and they were going to go out and fight with their deck gun. Now the second in command wanted to fire the torpedoes because the torpedoes were just going [unclear] on the surface what they do on the water. The captain didn't order the torpedo tubes outer doors opening and they popped up on the surface. And the Jap sitting there, he's listening, he isn't looking. And they had over two minutes before the Jap realized they were there. In fact, they started firing with their deck gun before the Jap noticed them. Well, when you sort of surface paddle between a submarine and a destroyer, there's not much depth what's going to happen and the submarine got sunk. The Commander Cromwell, who knew about Ultra, had no choice but to go down with the ship because he knew if the Japs captured him, Ultra would be out and that was it. He was one of the heroes of it. There were … [recording ends]

[END OF PRESENTATION]

[11] The wolfpack was a convoy attack tactic used in the World War II by the submarines of the United States Navy in the war in the Pacific. American wolfpacks were coordinated attack groups comprised of three submarines that sailed together so they were able to develop group tactics for attack on Japanese convoys.