Oral History of

William George Van Dorn

Interview conducted by Laura Harkewicz

10 July 2007

TABLE OF CONTENTS

ABSTRACT:

William George Van Dorn was interviewed in his home on July 10, 2007. Van Dorn was born in Chicago, Illinois on October 5, 1920. Prior to receiving his BS in engineering physics from Stanford University in 1946, he worked for several years (1940-1947) in various jobs in the aircraft industry, including work as a stress engineer at the Northrop Aircraft Corporation. He received his MS (1948) and PhD (1953) in oceanography from the University of California, Los Angeles/Scripps Institution of Oceanography. Van Dorn has worked under a variety of titles at Scripps including: senior engineer (1953-1963), associate research oceanographer (1963-1965), research oceanographer (1965-1979) and emeritus professor (1979-present). From 1978 to 1979, he acted as chairman of the Scripps Ocean Research Division. During his tenure at Scripps, Van Dorn worked through Los Alamos Scientific Laboratory (later Los Alamos National Laboratory), funded by the Office of Naval Research (ONR) with emphasis on tsunami measurements, particularly in relation to nuclear weapons tests at the Pacific Proving Grounds and elsewhere. The interview stressed Van Dorn's work with "long waves" (tsunamis), including his claim related to tsunamis on the moon. We also discussed his unique work experience as a liaison between Scripps and Los Alamos for the US Navy. We focused on his work in relation to nuclear weapons tests. In addition, we reviewed his "post-retirement" work in exercise physiology and acting as an expert witness in various litigations.

INTERVIEW HISTORY: The interview took place on a beautiful summer morning in the home of William Van Dorn and his wife Jeanette Van Osdol on July 10, 2007. Van Dorn lives in a retirement community in La Jolla, California. We talked in the dining room of his home, which offered a wonderful ocean view. We spoke for approximately two hours. The phone rang several times during the interview but the recording was never paused.

Laura Harkewicz
Oral Historian, Scripps Institution of Oceanography/UC San Diego
August 7, 2007

William G. Van Dorn, 1992.

INTERVIEW WITH WILLIAM VAN DORN: 10 JULY 2007

Harkewicz: It is July 10, 2007. I'm in the home of Dr. William Van Dorn in La Jolla, California. Good morning, Dr. Van Dorn.

Van Dorn: Good morning.

Harkewicz: So today, as I had told you, we're going to talk a little bit about your experiences at Scripps, and one of the questions I usually start with is how you came to Scripps and how you came to oceanography.

Van Dorn: By accident. I finished up a degree in engineering physics at Stanford and worked for several years in the aircraft industry during World War II, mostly for the Aerojet Corporation, newly founded by Theodore von Kármán. But after the war, my war, the aircraft industry was in a slump. And having spent many summers in La Jolla—I actually worked for Convair here in San Diego for six months—and looking down the road, the prospects for people who had been there ten years longer than I didn't seem bright. But in the meantime, my wife Nancy's[1] sister had been married to Walter Munk.[2] Walter had just completed his degree at Scripps, and he said, "Why don't you come to Scripps? We need people to design instruments." So I went out and was interviewed by Harald Sverdrup,[3] the director, who was a wonderful man, and he said, "Well, with your background you could come as an engineer, which is a nonacademic position, or you could come as a student, graduate student." He said, "The pay's the same, but I think you would end up better in the long run in the academic branch," which I did. So I was Walter Munk's first student. Walter Munk is still alive. I think he's ninety now. I'm the second oldest of all of the *[laugh]* academic people in the university, I believe.

Harkewicz: So Walter Munk was your advisor, then?

Van Dorn: Yes.

Harkewicz: So what was it like to be a graduate student at Scripps?

Van Dorn: Well, nothing like it is now. There were only five of us *[laugh]* and we were assigned various topics. Actually Walter was interested in waves in the ocean, so he divided the wave spectrum into five parts and each of us got a part. Somebody got tides, and I got the next gap, which was called tsunamis, long waves in the ocean. Somebody got wind waves, somebody got capillary waves, which are

[1] William Van Dorn married Nancy Chapin (1923-2000) in 1944. Her sister Martha was Walter Munk's first wife. Dr. Van Dorn married Jeanette Van Osdol on November 24, 2000.
[2] Walter Heinrich Munk (1917-), professor of geophysics at Scripps Institution of Oceanography.
[3] Harald Ulrik Sverdrup (1888-1957), a Norwegian polar scientist and oceanographer, was director of the Scripps Institution of Oceanography from 1936-1948.

these miniscule ripples. So I enrolled in October of '47 and that Christmas I went to Hawaii to put a newly designed tsunami recorder on the end of a no-longer-existent pier on the island of Maui. It took a month, Christmas and New Year's. That was my first field experience.

Harkewicz: Why is it that you had to go to Hawaii?

Van Dorn: Because Walter Munk had previously installed a much more complicated device on the end of Scripps' pier but its recordings were so noisy due to the surf action that we couldn't make any reasonable sense out of it. And Maui turned out to be practically noiseless and had lots of long waves, which I was interested in. That's how I got started in the study of tsunamis, really.

Harkewicz: So, does tsunami actually mean "long wave?" Is that what it means?

Van Dorn: Yes. You see, there is a quiet zone in the ocean spectrum between the tides and the wind waves. And they're separated by a wide gap in which there is no action at all normally. And when there's a tsunami, it manufactures low-frequency waves about one to ten minutes period, or something like that. And anything in that gap is a long wave and the principle source of long waves are tsunamis, caused by earthquakes under the ocean.

Harkewicz: So how did you feel about the way you got your graduate project with Walter Munk just dividing up the waves like that? Was that okay with you? *[Laugh]*

Van Dorn: Actually, I wrote my thesis on the wind stress on the Mission Bay Model Yacht Pond, which had just been constructed. I was originally assigned to a project, to measure deep ocean currents, by Roger Revelle and I built an instrument, at great effort for two years, and I hate to say it but on the second try of on our only ship, the *E.W. Scripps,* my instrument went down and never came back to the surface.

Harkewicz: Oh no.

Van Dorn: So I switched my thesis project to measuring the wind stress on the Mission Bay Model Yacht Pond. *[Laugh]* And it was a very good experiment. It's the best experiment, I think, ever done on how the wind exerts force on a water surface.

Harkewicz: Hmm. So your thesis experiment was, you think, your best experiment?

Van Dorn: I became famous overnight.

Harkewicz: Oh. Well, that's good. *[Laugh]* What was Walter Munk like as an advisor?

Van Dorn: Oh, he was fine. He was a very bright guy and very personable, and in all truth, though we've had six directors, it really has been Walter who ran things, even when Roger was there. Roger was only interested in building a university on the

hill, which came along twelve years later. And Walter is the element of continuity between all the directors and they've leaned heavily on him for advice. And he's won every medal known to science except the Nobel Prize, which isn't awarded for oceanography. *[Laugh]*

Harkewicz: You guys will have to do something about that? *[Laugh]*

Van Dorn: Right.

Harkewicz: Wasn't Walter Munk Harald Sverdrup's student?

Van Dorn: Yes.

Harkewicz: So, like you said, he was the bridge between all the directors—that's interesting. Nobody's ever said that before.

Van Dorn: And he and Sverdrup wrote a classic but erroneous theory of how waves break on beaches, which was of great help in the troop landings in the Pacific during World War II. When I say "erroneous" I mean it didn't have any sound theoretical basis. It was an ad hoc theory, but it was useful, very useful, during the war because its principal element was the forecasting of surf conditions in association with the wind conditions, the storm conditions in the Pacific.

Harkewicz: So it was useful but not necessarily theoretically based? Well, that's good. I know at least at the early period of Scripps there was a lot of talk about socialization, socializing amongst people. I know I spoke with Gustav Arrhenius[4] about that a little bit and I wondered if you were involved with that at all?

Van Dorn: We were in the middle of it.

Harkewicz: Okay.

Van Dorn: Maybe the principal cause of it. *[Laugh]* I don't know. *[Laugh]*

Harkewicz: How so? How do you mean that?

Van Dorn: Oh, when I finished my graduate work, my father had come down here and bought some land on the Muirlands and gave me three acres and I built an enormous house up there. I built it with my own hands.

Harkewicz: Really?

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[4] Gustaf Olaf Svante Arrhenius was born in Sweden in 1922 and received his doctorate from the University of Stockholm in 1953. He was a member of the Swedish Deep Sea Expedition of 1947-1948 and has been affiliated with Scripps Institution of Oceanography since 1952. He became a professor of oceanography at Scripps in 1959 and chaired the UC San Diego Department of Earth Sciences

Van Dorn: Just as I built my first little house in La Jolla, in Windansea Beach. And it was such a beautiful house that we often entertained when they were recruiting faculty for UCSD, while occupying a special building at Scripps Roger had set aside for them. My wife and I, our personal friends were actually more UCSD people than they were Scripps people. And that continues on to this day. I knew all the people at Scripps but our principal friends were in UCSD. A coincidence, but I can't explain it.

Harkewicz: Okay. So I won't ask you how that turned out.

Van Dorn: Anyway, when we were graduate students, it was the Scripps community, because there was no UCSD. And we just had a continuously gay time with parties, and the faculty and the students just mixed in, more or less. Biologists were a different group, but I was in Physical Oceanography. So those people I remained friends with for—they're all dead now, practically. Chip Cox[5] is still there and Gustav is still there. And, you said, well McGowan,[6] of course, is but he wasn't one of our group. He was a biologist.

Harkewicz: You were a student with Douglas Inman,[7] weren't you?

Van Dorn: Inman. Yes. Inman was ahead of me, actually, one year.

Harkewicz: Oh, he was? Okay. Sorry.

Van Dorn: I believe he was among our group of post World War II military trainees. He'd been in the Marine Corps. And he was a physical oceanographer, that's true. And he was a close friend and we went on many vacations together in the early days. That's what I remember the most. Nancy and I were skiers in the winter and in the summer we rented boats somewhere, you know, all over the country and all over the world, in fact. We often invited other couples to go with us and spend a week or two sailing in the Caribbean, or in Alaska, or in Baja.

Harkewicz: Sounds nice. *[Laugh]*

Van Dorn: In the late sixties, I wrote a big book called *Oceanography and Seamanship*.[8]

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[5] Charles Shipley ("Chip") Cox (1922-) came to Scripps in 1954 as a research oceanographer and served as professor of oceanography from 1960 until his retirement in 1991. He chaired the Ocean Research Division.

[6] John Arthur McGowan (1924-) received his PhD in biological oceanography from the University of California/Scripps Institution of Oceanography in 1960 and remained on the Scripps faculty his entire career, becoming a professor of oceanography in 1972.

[7] Douglas Lamar Inman (1920-) received his PhD from the University of California/Scripps Institution of Oceanography in 1953 and was a research assistant in coastal geology at Scripps beginning in 1947. He was appointed professor of oceanography in 1987 and was the founding director of the Center for Coastal Studies at Scripps.

[8] William G. Van Dorn, *Oceanography and Seamanship* (New York: Dodd, Mead, 1974). A second edition was published in 1993.

Harkewicz: Yes, I remember reading about that. I haven't looked at it though, I'm afraid.

Van Dorn: It's up on the shelf there.

Harkewicz: Okay. *[Laugh]* I see it there.

Van Dorn: That blue one. *[Laugh]*

Harkewicz: Yeah. I see it right there.

Van Dorn: It's actually sold 60,000 copies, which is pretty good for a trade book. At any rate, we had a very active social life. We all used to get together more at the El Sombrero, which is no longer there, on Faye Street, a Mexican restaurant owned by Tony Vargas, who played the guitar quite well while his wife cooked. And for many years as many as thirty of us were collecting there on Thursday night to drink beer and sing songs.

Harkewicz: So I guess you've seen La Jolla change a lot over the years?

Van Dorn: Yes. When I was a student, when I first started, there was not a house in La Jolla Shores. I take it back. There was one on the beach, the first one after the parking lot. But that's all. The hills, they were all empty. I think it was a two-lane road that wound its way tortuously up the hill—

Harkewicz: Uhm-hmm.

Van Dorn: —totally bereft of houses, and connecting 101 with La Jolla, and the only way in. And I think there were about maybe 3,000 people in La Jolla at that time. Although I came to La Jolla in 1925 with my father on a little steamship called the *Harvard* out from Los Angeles.[9] We stayed at the Grant Hotel. I had to sleep in the same bed with him and he snored. *[Laugh]* These are recollections. And rode the trolley out to La Jolla and remembered thinking, "This is where I'd like to live."

Harkewicz: Really?

Van Dorn: Yes.

Harkewicz: How nice. *[Laugh]* And then you ended up coming here?

Van Dorn: Then we spent many summers here. Sometimes we'd go to other places, like Laguna, or Santa Barbara, or Coronado, but mainly we came to La Jolla in the twenties and thirties.

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[9] The steamship *Harvard* was operated by the Los Angeles Steamship Co. after World War I and operated between San Francisco, Los Angeles and San Diego until she was wrecked in 1931.

Harkewicz: Now, you were born in Chicago, right?

Van Dorn: Yes, but I left at age four.

Harkewicz: Did you move out to California, then?

Van Dorn: Yes. My father wanted to continue his education so he enrolled at CalTech, but he found he was too old. He was out six years because of World War I, and he was an inventor, as was his father, and his father, and his father. All made their living handsomely on inventions. I invented quite a few things but I only took out three patents, I think, none of which made money. But I invented a water sampler, which is sold by the thousands, and which is well known as the Van Dorn Water Sampler.

Harkewicz: I think I've seen pictures of that.

Van Dorn: Yes. It was invented, in fact, to collect radioactive water samples from an early atomic test that the United States, that Scripps participated in in 1948.

Harkewicz: The Crossroads tests? Well, that's a good segue there.

Van Dorn: I take that back. It was Wigwam in 1956.

Harkewicz: The San Diego test, then?

Van Dorn: Yes. Off San Diego.

Harkewicz: Okay. That's what you developed it for?

Van Dorn: It was designed to be dropped from an airplane, and land in the ocean, release the sampler, which would go down 400 feet. It was a water-filled bomb, actually, that floated. It was empty but it floated, and the sampler went down and a candy Lifesaver dissolved and triggered the release and it came back to the surface. Excuse me. It stayed down there at 400 feet, and took its sample when the Lifesaver dissolved, and a helicopter came along and picked it up with its hoist cable. And there was a hook on the end of the line released by the sampler float that the cable could pick up, and it was designed to be set down on the deck of a carrier into a water-filled tub, and then technicians could take it into the lab and measure there very early on the atomic level and the constituents of the sample. And that's a very funny story, because we practiced on the beach and got very good at it, and, with the helicopter squadrons from El Toro, and it worked beautifully on the trial run in January off San Diego. But on the actual test 700 miles southwest of here there was a fairly strong wind blowing, about thirty knots or something. And a tug was towing this array of instruments seven miles long with the atomic device 2,000 feet down under the water. And *[laugh]* . . . well.

Harkewicz: The helicopter had trouble picking up the . . .

Van Dorn: The device went off and the, your cohort, you know, what's her name? At Scripps.

Harkewicz: Deborah Day?[10] Yes.

Van Dorn: Deborah has a picture of that shot. And, I was flying right over it in an airplane dropping samplers in the water and measuring the surface radioactivity. Somebody else was measuring the temperature, and somebody else was measuring other things, debris and stuff. At any rate, then we went back and landed on the carrier and the helicopters came flying in, but the captain of the ship said, "I don't want those choppers dropping radioactive stuff on my deck," he said, "Drop it in the ocean and we'll lower a boat to pick it up." *[Laugh]* So the helicopter, the first chopper dropped its sampler and they lowered a boat, and it went down whiz bang! *[Clap]* It went down and started swinging and it hit the side of the ship. Well, it was down fifty-five feet, and stove in the side of the lifeboat. *[Laugh]* So they hoisted it back up again and there was a long debate, and then the next lifeboat went down very fast and *[clap]* hit the water with a bang, and then on the roll back they cast off what are called the "falls" that connect the hoist to the boat. The forward falls disconnected but their rear one didn't. So as the ship rolled it just picked the lifeboat up by one end and all the sailors were dumped in the water.

Harkewicz: Oh no. *[Laugh]*

Van Dorn: And this not too far from where the bomb had gone off.

Harkewicz: Oh yeah.

Van Dorn: And so then there was great concern about these vital samples. I don't know how many million dollars had been invested in these samples that had been collected by my sampler. They lowered a third lifeboat and it got away okay but all it did was to pick up the guys that were in the water, *[laugh]* came back and they had a terrible time hooking it up. They finally got it hooked to the falls. But the ship was now rolling like hell, because the ship was broadside to the sea. When a ship has no power it turns broadside to the sea. So they hoisted it up but one of the falls had tumbled through its block. It had gotten a twist in the line, and they couldn't get it to the top where the guys could get out, so they hung there fifteen feet down for an hour. And finally they lowered it down and opened a big hatch in the side of the boat and hauled the boat in sideways to the hangar deck. And that was the end of that sampling exercise.

Harkewicz: So did you ever, you never got the samplers, then?

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[10] Deborah Cozort Day (1951-) was archivist of the Scripps Institution of Oceanography from 1981-2008.

Van Dorn: Never got the samples.

Harkewicz: Oh, my goodness.

Van Dorn: Which was one of the principal reasons we were out there. Of course, the tug had seven miles of instruments in the tow, and they had two model submarines, and whatnot, to be shocked. And at any rate, we also had a fish study going on to see how many fish we had killed—they never found the dead fish. *[Laugh]* So maybe there weren't any.

Harkewicz: Now, Wigwam, that had to do with the impact of nuclear devices on submarines, or something?

Van Dorn: That's right. There were two model submarines, quarter-scale, hanging down from two—I wish, I don't have that picture. Deborah has it.

Harkewicz: Okay. I'll have to look for that.

Van Dorn: You can see the, there are three barges, big barges, YFMBs they're called. You can see them in the picture. They look like little dots. Well under each, the front two, are submarines down below, or the back two. I forget. The front two had something else. Those were all shock tests. It was a Navy exercise.

Harkewicz: But this was a secret test, wasn't it?

Van Dorn: Oh yeah. Everything was secret in those days. None of the nuclear tests were ever announced, I mean, except in an ad hoc way. Months and months later a little scribble would come out in the paper. You see, we got involved in the Pacific because they were shaking the buildings in Las Vegas as the bombs got bigger. They weren't bombs. They were called "devices." And they were not, in fact, bombs. They were just tanks of stuff. So they had to move to the Pacific where they made an agreement with the British to use the Marshall Islands, which were part of the joint US-British Trust Territory of the Pacific, which is now the Republic of—god, I can't remember the name.

Harkewicz: It's the Republic of the Marshall Islands now, is what they call it.

Van Dorn: No. It's a Marshallese name.[11] At any rate, Christmas Island is the eastern most one, and that was the site of the largest test program, which went on in '62, seven months. Although, I was also there at Johnston Island, where they fired some rockets up and shot off some devices very high up. But the first actual bomb tests were at Christmas Island and the planes flew down from Hawaii and dropped these test bombs on targets that were moored in the ocean 10,000 feet deep offshore thirty miles away. I designed the moorings and Willard Bascom's

[11] The Republic of Kiribati.

company built them.[12] We had a ship, a Navy ship assigned to us that installed the moorings, and then they would tow barges out for each test and put them on one of these moorings. The barges were just blocky caissons, empty shells. They had diesel engine generators on them and all sorts of instruments, and big lights and, so the plane could see them. And they were at various distances, and they were all put there because people on the shore that were looking at these devices wanted stable platforms where they could know exactly where the device was going to go off. Because they only had a limited window of observation. So the things are thirty, forty, or fifty miles away. Well, it looks big, as you can see that one. *[Laugh]* That's forty miles across, that one cloud.

Harkewicz: That mushroom cloud? Yeah. *[Laugh]* That's pretty big. Now, this was, you said, in the sixties, did you say this was?

Van Dorn: Sixty-two was the last one before the moratorium.

Harkewicz: Okay. Before the atmospheric—yeah.

Van Dorn: Kennedy signed a moratorium with Russia and . . .

Harkewicz: The Limited Test Ban Treaty?

Van Dorn: And cut off all, everything, including my atomic cannon, which the government was working on.

Harkewicz: But, okay, yeah, I think I read a little about that. Can you tell us a little something about that?

Van Dorn: It's a . . .

Harkewicz: Well, let's back up here a minute. Let's go back to actually the, some of the earlier tests like Operation Ivy. And you know, there's been stuff written about how the *Horizon* was contaminated with radioactive material during, after the . . .

Van Dorn: Yes. It was right under the edge of the cloud.

Harkewicz: Were you on the *Horizon* at the time?

Van Dorn: I wasn't on the *Horizon*. No, I was on Midway Island, in fact. I had charge of the distant island stations. So I invented a little portable tsunami recorder that we gave to six graduate students and they went out and installed them around the Pacific. They were told how to get a piece of pipe and bolt it to a pier so the lower end was down four feet, and screw this thing on the top, and there was a recorder, a little recorder in a box and it had a weight that was down there and a

[12] Willard Newell Bascom (1916-2000), engineer, research oceanographer and inventor, founded Ocean Science and Engineering (OSE) in 1962.

pulley, and the waves would make the bellows at the bottom expand and contract so that it moved the counterweight up and down, and that made a recording. Very successful.

Harkewicz: Now, at this time, let's see, were you a . . .

Van Dorn: I was on Ivy, Operation Ivy.

Harkewicz: Were you still a graduate student at that time?

Van Dorn: Yes.

Harkewicz: Okay. You were still a . . .

Van Dorn: Well, I had finished my graduate work but I hadn't got my degree yet.

Harkewicz: That was in '52, right?

Van Dorn: Fifty-two.

Harkewicz: And . . .

Van Dorn: It was November 1, 1952.

Harkewicz: Right. That was the first hydrogen bomb, correct?

Van Dorn: Yes, the Super.

Harkewicz: So, there was concern about a tsunami?

Van Dorn: Well, that's how Scripps got involved. Very late in the planning Edward Teller[13] had been fired from Los Alamos and went up and established his laboratory at Livermore. But of course he kept coming down to see how things were going. And Livermore—no, I mean Los Alamos. I'll just call it LASL, because that's what I remember it by.

Harkewicz: Which stands for Los Alamos . . .

Van Dorn: Scientific Lab, in those days.

Harkewicz: Okay.

Van Dorn: LASL building the Super. They weren't building it there. They designed it there. It was built in pieces all over the country and shipped directly to the Pacific. They were sent on the same ship, only not assembled. All the pieces were put on

[13] Edward Teller (1908-2003), Hungarian-American physicist.

a ship, the *Curtis*.[14] It was a light cruiser, not the command ship. It was the device ship. And then transported under escort to Enewetak where the device was assembled in a shed at a distant, the farthest, in fact the largest motu in the chain. And the command center was clear across the island on the atoll on the motu of Enewetak, and there was a firing cable that ran the whole distance across the lagoon. And at every motu they had branches that went ashore, to the instruments, all different kinds.

Harkewicz: So, what's a motu?

Van Dorn: A motu is an islet in a chain that forms an atoll. And it's connected by coral reefs that are awash at low tide. But all of the larger atolls had openings that were usually on the west end and are deep. Ships can go in and out. The atolls are typically about 180 feet deep, and they fill in gradually. All of the ones in the eastern Pacific. They're almost on the equator where there's very little rain. And when the last opening closes, coral grows and then the rest of it just gets splashed on as the waves break over it. But the reef is porous and the water can go underneath. That's why fish grow in there. And, a wonderful example of that is Manihiki Atoll, five miles across. And it has different kinds of fish inside and outside, and it has different kinds of boats that go fishing inside and outside, because there's no opening in the reef. And natives live on mostly one end of it, but there's no way a ship can get through. And at low tide, there's about a five-foot drop from the edge of this table reef, and there's a waterfall ten miles long formed all along the reef. You can see the level of the water from the outside standing up in a boat. *[Laugh]*

Harkewicz: Really?

Van Dorn: Quite a remarkable thing.

Harkewicz: Uhm-hmm.

Van Dorn: Anyway, LASL got the go-ahead working on the device in January, as soon as Truman issued a go-ahead. They started furiously to work on it and they had a target date of October to shoot it. And by March it was clear that they couldn't possibly get it done by October, so they shoved it back to November. And, they had to get it done by the 3rd, the election date was on the 4th, Tuesday the 4th of November, and Eisenhower won the election. They knew that he was going to win it, and they knew that he would cancel the test if he got in before it happened. So we had a window. I wasn't involved at that time. But in March, Edward Teller came down to the lab from Livermore and said he found a mistake in his calculations. There was tremendous ambiguity about the energy that might be released. They were designing it to be two-megatons, two million tons of TNT

[14] USS *Curtis* (AV 4) had an extraordinary history. It survived the attack on Pearl Harbor and saw wartime service in Korea before being assigned to several of the Pacific atomic tests.

equivalent. They were happy with one, upper limit of five. But Teller came down and said, "It might go a hundred." *[Laugh]*

Harkewicz: That's a little bit of a range there?

Van Dorn: At a planning meeting, you know, he walks in. And so that's when everything hit the fan and they certainly thought, "God, we might break . . ." They had a Hazard Evaluation Unit in the test group. "We might break a piece off the island and make a real tsunami." And so they sent an emissary, a Naval officer, this captain I think, to Scripps to talk to Roger and Walter. I was there and Jeff Frautschy[15] was there, a geologist. And the question arose, "Could we break a piece off? And if we did would it make a tsunami? And if it did, what would we do?" So it was agreed that if it broke a piece off and made a tsunami that the newly-established tsunami warning system in Hawaii would announce a fictitious earthquake in the vicinity of Enewetak, and the Japanese just had to take it from there. *[Laugh]*

Harkewicz: I see.

Van Dorn: So it was a little bit of an iffy situation politically.

Harkewicz: Uhm-hmm.

Van Dorn: Of course, nobody knew about this except the task group. In fact, with the war in Korea going on none of the incumbents in that war had any knowledge these tests were going on. After helping install all the island stations, I ended up on Midway Island and found I couldn't communicate with the task force. We had code signals but I couldn't get transmissions to Enewetak, the traffic was so heavy. All the planes were going through Midway, island hopping to Japan, or fighting in Korea. So I went down in the hobby shop and built a seismometer so that I could see if the test was successful. And then I could run out to my tsunami recorder and make sure it was operating perfectly.

Harkewicz: So that's how you found out when . . .

Van Dorn: That's how I knew it went off. I got a beautiful record, about twenty-two inches of waves came along several hours later. And the seismic waves go at one mile a second, roughly, and the water waves go at only 750 feet a second, which is a tenth of, you know, twelfth, a sixth of a mile, six times slower.

Harkewicz: So other than this device that you developed you wouldn't have known when the bomb was, went off?

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[15] Jeffery Dean Frautschy (1919-1993), marine geologist and assistant director of the Scripps Institution of Oceanography.

Van Dorn: Not for sure. I was given this target date and all the bombs that we shot out there went off just before daylight, because they wanted to view the fireball at night. And so I knew it would be early in the morning. I mean, it would be—well, let's see, it's 1,200 miles from Enewetak to Midway, and it's about several hours.

Harkewicz: So obviously you didn't see anything, then?

Van Dorn: No. I saw nothing at all. But I saw a beautiful earthquake, fake earthquake, signal. *[Laugh]*

Harkewicz: But there wasn't any tsunami, right? There wasn't a piece that broke off or anything like that?

Van Dorn: No there wasn't. But we had another objective: what would the waves be like in any event, inside and outside the lagoon. The task force, the Hazard Evaluation Section [was concerned] that if they accidentally dropped one in the ocean, how big would the waves be? And that was my primary task for the first twelve years after I got my degree. Since I started in '52 with that, I continued every other year until '62. And in fact, the last two tests were underground in Alaska, at Amchitka Island—in the seventies. They were worried then that it might bulge the island enough to make a tsunami. And so we had to alert the natives all along the Aleutian Islands and I had to make little speeches to the groups of Indians, natives.

Harkewicz: In their language?

Van Dorn: About—no, they, they had public meetings in Anchorage and some other places, and I talked to groups that they needn't worry, because it would be a very small effect, hardly noticeable, we hoped. *[Laugh]*

Harkewicz: Did you tell them it was an atomic test, at that time?

Van Dorn: Yes, they knew what was going to happen. We were going to shoot a bomb under the ground on the island. At that time it was widely known that we had this capability and the fact that so many people were going in ships way out to this lonely place. A terrible place. The wind gauge is a chain hanging down. When it's less than forty-five degrees you can go outdoors. *[Laugh]*

Harkewicz: I see. I see.

Van Dorn: They had to dig a seven foot hole a mile deep in solid rock. It took them two years.

Harkewicz: They couldn't find someplace else that they wouldn't have to do that?

Van Dorn: No. That was the last thermonuclear—that was the last multi-megaton test, thermonuclear test.

Harkewicz: What was the rationale for doing it in Alaska, then?

Van Dorn: We weren't allowed to do aerial testing. That was under ground. And it was too big to do in Nevada.

Harkewicz: In Nevada? Okay. I see. So you said that the whole time that you, from '52 to '72, you were measuring the waves?

Van Dorn: Artificial tsunamis. Actually, I was measuring real tsunamis, too. I measured four tsunamis out of the five that occurred in the twentieth century. So I became known as "Mr. Tsunami."

Harkewicz: I see. *[Laugh]*

Van Dorn: And I had three stations. My permanent stations were Wake, Johnson, and Canton Islands which I maintained all during that time, and on into the late sixties, in fact.

Harkewicz: Permanent stations?

Van Dorn: Yeah. They weren't the same instruments. I kept improving the instruments. So every other year, we'd get wiped out for one reason or another and I'd have to go out and improve the station, reestablish it at these three islands.

Harkewicz: So who were you working for? I mean, like who was paying your salary? Was it ONR?

Van Dorn: ONR. We had an omnibus contract and I was just one item on the omnibus. So all the reports I wrote were signed by Roger, not by me.

Harkewicz: So what is the relationship then that you had between Los Alamos and Scripps? I mean, were you working for both of them or how did that work?

Van Dorn: Well, I was a permanent member of the Hazard Evaluation Committee. It was called the "Tamarin Committee."

Harkewicz: And that was based at Los Alamos?

Van Dorn: At Los Alamos. So I spent a lot of time there. Then they would split up and then they began to move around, and later they were in Nevada, Las Vegas, because the AEC, the western operation office was in Las Vegas. So the Tamarin Committee met there. And still later on, we were designing super permanent tsunami recorders in Anaheim under a company that I had been using to calculate

the waves as the bombs went off. My principal job was to learn how to calculate the waves the bombs might make anywhere, offensively or defensively. And so the Defense Department would say, "We want to know what happens if we shoot a bomb this big here, or there, or the Russians do it, or somebody else does it."

Harkewicz: So, were you—okay.

Van Dorn: But of course, I couldn't tell anybody what I was doing and nobody at Scripps knew what I was doing except Walter and John Isaacs.[16] Isaacs was my titular boss, but—this is sort of a secret, which I haven't let out—but Walter hired me first to make instruments for him. He wanted an assistant to design instruments, and I bugged out with the first test. I was snatched out of his hands. He got somebody else to do it. And so Walter always had some assistant designing instruments for him. And I was working on these classified projects so nobody knew really what I was doing, and I was gone half the time. I couldn't tell my wife where I was, or how long. *[Laugh]* And my three children grew up in absentia, sort of.

Harkewicz: So your whole family was here, then, in La Jolla?

Van Dorn: And we had this great big house. And when I was here we had an active social life and I'd just be gone for two, three, four, five, or seven months.

Harkewicz: Were you normally then off in the Pacific somewhere, or were you in New Mexico?

Van Dorn: I was, well, mostly in the islands, small islands in the Pacific, or in the central area, in the Marshalls. But I made a number of trips to Japan. I started an organization to collect all the old Japanese records of tsunamis, and got a funding of $50,000, which I gave to the Japanese and they founded an organization called the Japan Organization for Tsunami Investigations. And I was on its board and I went there every other year for many years, and invited some Japanese scientists to come here and work on tsunamis. They actually worked in Berkeley because they had better facilities, big tanks where they could work generating tsunamis.

Harkewicz: So you were able to use this instrumentation or this information that you developed for natural tsunamis, right?

Van Dorn: Yes. It worked perfectly.

Harkewicz: Real, *[laugh]* real tsunamis? I see.

Van Dorn: Because they're in the same spectral window.

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[16] John Dove Isaacs (1913-1980) was trained as a wartime research engineer at Berkeley and joined the Scripps Institution of Oceanography as an associate oceanographer in 1948. He advanced to professor of oceanography in 1961 and served as director of the Institute of Marine Resources from 1971-1980.

Harkewicz: Okay. All right. But all this time, like you said, your family never knew what you were doing?

Van Dorn: No.

Harkewicz: Is that why you described yourself as the "mystery man" or something in one of your writings?

Van Dorn: Yes. They'd see me writing in my little desk up in my lab when I was here. *[Laugh]* I would have things made in a shop, and then I got my own shop and we made our own stuff in there. Later we were down at Point Loma where there was a Marine Facilities shop.

Harkewicz: Now wait. How is it, though, okay, if this is all classified information how is it that you were able to give this stuff to the Japanese, then?

Van Dorn: I didn't give them the stuff. I just asked them to collect tsunami records, because only through the study of tsunamis could I get a wide spectrum of their effects. The Japanese had records going back a hundred years, and I was the only American guy in this racket—so I had every tsunami tide record here. I had whole drawers full of them. And I analyzed those and I wrote a lot of papers on real tsunamis, too.

Harkewicz: Okay. So that was a question I had then. How did all this classified work affect your career? You were able to write about unclassified stuff?

Van Dorn: Yes. My first unclassified paper was in '41. See, that's eight years after my thesis. And if you don't publish stuff academically you don't prosper. But I was useful to the growing Scripps because I was bringing in a lot of contract money every year.

Harkewicz: But how did you feel about that? I mean, like you just said, if you couldn't publish . . .

Van Dorn: I thought I was very lucky because it was policy that when you got a degree at Scripps you would then vanish *[laugh]* and find a job somewhere else. And this ensured my having a job at Scripps that nobody could contest or disagree with. I was an essential cog in the machinery, but one which no one mentioned. *[Laugh]*

Harkewicz: Essential? A secret cog in the machinery or something?

Van Dorn: Of course, we had a ship out there, too, and it was another cog, but it was run by John Isaacs. Walter went along for the very first test the . . .

Harkewicz: The Ivy Test?

Van Dorn: The Ivy Test. After that, John Isaacs was in the central area and I was implanting things all over the ocean. And then we had the International Geophysical Year and things blew up much larger. I had about forty islands to worry about for a couple of years. I spent six months in Tahiti, which was a great experience in those days. It's so different from now. I saw it as Charles Nordhoff[17] saw it. I knew his family, lived in his house. But at any rate, *[phone rings]* I was lucky, as I said in my "Life and Times." I was a unique person. I never had to write a proposal for money. They just came around every year and said, "How much do you need next year?" And it went on for twenty years.

Harkewicz: Okay. Two things I have to ask before I forget. First of all, how did that affect your personal life, then, being gone so much?

Van Dorn: Well, I enjoyed being out on the ocean. I loved it. We did lots of diving, scuba diving, and I was always enthralled by underwater vistas, these uninhabited islands we went to, a lot of them, were scarcely inhabited. And I loved traveling in Polynesia and all over the Pacific in the Marshalls. So . . .

Harkewicz: But your family was never with you on any of these excursions?

Van Dorn: They weren't with me.

Harkewicz: So how did that affect them?

Van Dorn: It was very hard on my wife. My kids say I hardly knew they existed, *[laugh]* which is not true, really. I was here at least half the time and . . .

Harkewicz: Was it hard for you, then, to be a family man when you were here?

Van Dorn: Not really, we had a very active social life, as I said.

Harkewicz: Yeah, you did say that.

Van Dorn: And nobody knew what I did.

Harkewicz: Okay. So then you said you did this for twenty years and it was great because you didn't have to write any grants and all that stuff, but then atmospheric testing stops and what happened after that, then?

Van Dorn: Well, the interest in waves continued and I continued to work on wave problems. I worked surf, breakers, breaking waves in storms, and things like that, as well as tsunamis. I continued that right up until I think it was '76 or '78.

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[17] Charles Bernard Nordhoff (1887-1947) English born American novelist and author of adventure stories and travel books including *Mutiny on the Bounty* (1932). His first wife was Tahitian and he lived on Tahiti for many years.

Harkewicz: And this was still working for ONR?

Van Dorn: Well, no. I had . . .

Harkewicz: Or through ONR?

Van Dorn: I had several other independent grants. I had some NSF grants. I studied circulation around islands. My only two ship assignments were when I had a ship that was measuring circulation around islands. I was looking for Kármán vortices in the wake of the wind stress, and I couldn't find any. First because the islands were too big and the tides confused the circulation. And the second time when I went to tiny islands, one was only as big as the Rose Bowl and looked just like it, but there was no wind for thirty days. It was dead calm. So. *[Laugh]* I didn't even get a paper out of those two trips. At any rate, they finally stopped paying me for looking at waves, so I went to work with Inman and studied circulation, how to keep mud out of Navy harbors where it was entombing their submarines when they were getting repaired, or other ships, too. So I studied the mud problem in five different naval bases all around the country: Charleston, Mare Island, Mayport, Florida, San Francisco.

Harkewicz: So a lot of traveling involved, then?

Van Dorn: It was very interesting work but it was nonscientific, or just engineering studies. I didn't even publish a paper on that stuff. We just had reports. The Navy was very interested in it. But then I got stuck with being a chairman of the Physical Oceanography Research Division.

Harkewicz: Now, that must have meant you were here for an extended period of time then, as opposed to going traveling around?

Van Dorn: Yeah, I was here always. No more traveling. In fact, since about '70—well, the mud problem took me away for a month or two a year, but no really long periods. But then when I got through with the mud I was chairman and all I did was hire and fire people, and review their appointments.

Harkewicz: That must have been . . .

Van Dorn: And I found you could not fire a person from UCSD. They could appeal it indefinitely. So each time they appealed, we had to go through assessment, committee reviews, new committees, new committees, and finally then an appeal and start all over. And it took all my time just doing that sort of stuff and I had a half-time appointment, and I couldn't even work on my research in that time. So, I retired.

Harkewicz: Let's see, this was . . .

Van Dorn: Seventy-nine.

Harkewicz: Okay. *[Laugh]*

Van Dorn: And then . . .

Harkewicz: You were forced into retirement because you couldn't . . . *[Laugh]*

Van Dorn: Well, I wrote the director a note, a long letter, and said, "This job takes four people, and the first guy ought to get paid," *[laugh]* which he did. Russ Davis[18] got the job and he got paid, and he had three assistants to appoint all these committees and review them. After I retired I bought a ski lodge in Telluride and so Nancy and I spent half our year up there and half here. And I could work half-time after I retired, but not full-time. And half-time was just a contract. It didn't apply to my academic status. I mean, it did apply but I wasn't on the university payroll anywhere. I was on a, you know, paid under contract.

Harkewicz: I see. Before . . .

Van Dorn: So . . .

Harkewicz: Before we get too far ahead, though, I just wanted to ask you one more thing about this whole Los Alamos/Scripps connection. I mean like were you the main person involved with this or were there other people that worked sort of through both places?

Van Dorn: Were other SIO people involved in the testing business?

Harkewicz: Well, you know, you said you were . . .

Van Dorn: In the beginning we had a ship. It went to three tests. And after that the ship was not used anymore and but we had another guy, Ted Folsom,[19] whose job was to track the radiation as it traveled. He found it was a wonderful tracking device by measuring radioactive cesium which lasts a pretty long time. I forget how long. Thirty years or something. He could track the movement of water masses all around the ocean, circulation, mid-depths and all depths, and that was a wonderfully fortuitous discovery. He had used that. But then the Russians were testing, too, and the AEC found out that they could track the Russian tests because of the cesium in the ocean. *[Laugh]* As well as the earthquakes they generated.

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[18] Russ E. Davis (1941-) a physical oceanographer affiliated with the Scripps Institution of Oceanography since 1968 when he joined the Institute of Geophysics and Planetary Physics at Scripps. He has been a professor of oceanography at Scripps since 1977.

[19] Theodore Robert Folsom (1908-1989) got his PhD in physical oceanography from University of California/Scripps Institution of Oceanography in 1952 and remained at Scripps as a research oceanographer until his retirement in 1975. His research focused on radioactivity in the marine environment.

Harkewicz: Okay.

Van Dorn: Yeah. Folsom was the other full-time person. He actually worked on some other things, but he didn't talk to anybody either.

Harkewicz: I see. *[Laugh]* All right. So I . . .

Van Dorn: We weren't close. He had his lab on Mt. Soledad up there and I was on the campus.

Harkewicz: Okay. So I took you off of your track when we, we got up to the seventies. Oh, but I did want to ask you this, though, and I'm not sure what time frame, you were talking about John Isaacs earlier and . . .

Van Dorn: Well, Isaacs ceased to be a factor in '56, in my work. I became the AEC's permanent appointee, and I was representing Scripps at Los Alamos.

Harkewicz: I see. So were you working . . .

Van Dorn: And I was a task group commander in their Hazard Evaluation group. And each test was run as a joint task force, and it was divided three-quarters military: one-quarter Navy, one-quarter Air Force, one-quarter Army. The Navy hauled people. The Army guarded every building. *[Laugh]* The Air Force took photographs, and hauled dignitaries around.

Harkewicz: So you were with the Navy, though, for that?

Van Dorn: And then the other quarter were scientists.

Harkewicz: Okay. All right. Sorry.

Van Dorn: Who assembled the devices, and fired them, and did all the analysis, and I was one of those guys, and I was attached to Los Alamos, although I was paid by UCSD and lived here.

Harkewicz: Hmm. So then UCSD must have gotten something from . . .

Van Dorn: Yes. They got the contract. I got a contract for my services.

Harkewicz: All right. So but still, even though you were attached to Los Alamos you still had, your home base was still, supposedly, in La Jolla then?

Van Dorn: I was, yeah. I never . . .

Harkewicz: Moved to New Mexico then?

Van Dorn: I never lived there, until I was employed by their archives *[phone rings]* to write the history of the first H-bomb.

Harkewicz: Oh. Okay.

Van Dorn: And that was in '93.

Harkewicz: I see. Okay.

Van Dorn: See, I wrote the book about Ivy in like '82, two years after I retired up at Telluride, but I wrote it as a novel because it was still classified.[20]

Harkewicz: Oh, okay.

Van Dorn: It was an accurate account of what went on. Everybody had false names except the principals. Because that book, which is right here—Deborah has a copy of it—is an accurate account of the Ivy test, the most accurate account you'll find about all the things I've been talking about. When Harold Agnew[21] read it, I asked him what he thought and he said, "It makes me nostalgic." *[Laughter]*

Harkewicz: But it was never published, right?

Van Dorn: I had an agent, but editors wanted it to be nonfiction, and I couldn't say it was. I called it "faction."

Harkewicz: I like that. *[Laugh]*

Van Dorn: You know, factionized, fictionalized fact.

Harkewicz: Yeah. Uh huh.

Van Dorn: And that's what it is.

Harkewicz: Do you think, I mean . . .

Van Dorn: The secret of how it works is fictitious in the book. But I know. . .

Harkewicz: So would that still be secret now?

Van Dorn: I know now much more about it because I was in the archive. I had unlimited access to the archives, and I knew all the people that designed it.

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[20] William G. Van Dorn, *Ivy-Mike: the First Hydrogen Bomb* (Philadelphia: Xlibris, 2008).

[21] Harold Melvin Agnew (1921-) was associated with the Los Alamos National Laboratory from 1949-1970 and directed the weapons division of the laboratory from 1970-1979. He had a long and distinguished career as a physicist in government and in academe including an appointment as adjunct professor at UC San Diego beginning in 1988.

Harkewicz: So who asked you to write this history of the H-bomb?

Van Dorn: Who wrote it?

Harkewicz: No, who asked you to? You said you were asked . . .

Van Dorn: Oh, I gave copies of my book, when I couldn't sell it, to a lot of people I knew who had lived in those days and they thought it was great, and then I got an invitation to write a history for the archives. The instance for that was their associate director John Hopkins of Los Alamos.[22] I bought a motor home and went to Los Alamos and lived in the Los Alamos Inn parking lot *[laugh]* for six months and worked on this book. But I mainly worked on it here. At LASL I was taping interviews of everybody and piling through the archives. The archives were total chaos. Nobody knew where anything was, except one guy, Roger Meade, had a vague idea which sections things were in.[23] So he would diligently hunt for stuff and dig it up. I had a big collection of materials but I couldn't take it out of there. And the whole device was designed by the Panda Committee, and they were a group of the principals at Los Alamos. And they met once a week and discussed it. Each one was in charge of a different segment, and that's wonderful reading, the minutes of the Panda Committee.

Harkewicz: But you had access to all this information?

Van Dorn: Yeah.

Harkewicz: Did you still have like Top Secret clearance at the time?

Van Dorn: Yes. They renewed my clearance and upgraded it.

Harkewicz: So what happened to this thing that you wrote, though, that history?

Van Dorn: All I have is—in the middle of it, just as I got to '43, when Los Alamos was started. I started back in '01 when the atom was discovered, *[laugh]* right on up through the first atomic bomb. I have a copy of that called "The Super." I don't know if you've, it's, I think Deborah has a copy of that.[24]

Harkewicz: Okay. I'll check that out.

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[22] John Chapman Hopkins (1933-) nuclear physicist on the staff of Los Alamos National Laboratory 1960-1972 and visiting scholar at UC San Diego 1992-1993.

[23] Roger A. Meade (1951-), principal archivist and historian, Los Alamos National Laboratory, 1984-2007. Co-author of *Critical Assembly: A Technical History of Los Alamos During the Oppenheimer Years, 1943-1945* (Cambridge: Cambridge University Press, 1993).

[24] William G. Van Dorn, " History of the Super Project," 15 November 1993 (draft).

Van Dorn: That's interesting reading. The people who read it said they think it's the best thing I ever wrote.

Harkewicz: But . . .

Van Dorn: But it stops in the middle. And the rest of the stuff I kept on discs here, I mean in Del Mar, for many years and I couldn't do anything with them since '93. And then finally a year ago John Hopkins said he was going to finish it and I sent him all the tapes and discs and everything I had here. I was glad to get rid of it.

Harkewicz: Like last year or so?

Van Dorn: Yeah.

Harkewicz: Huh.

Van Dorn: So he has it all now. He's still there, retired, but he's allegedly writing the history. Although his wife just died. I'm not sure how he's doing.

Harkewicz: Is that kind of stuff still classified, though, some of that information? Would he be able to publish that?

Van Dorn: No. It was written for LASL/Classified Archives. But it's difficult to find what is classified. The sweeping executive order recently that everything before a certain date is unclassified doesn't mean a thing. Because the problem with classification is that once it's classified, nobody has the manpower to dig through the archives and decide what applies and what doesn't. So and it's got a big stamp on it. It's Top Secret. You can't freely pass it out to the public.

Harkewicz: Okay.

Van Dorn: That's the way it stands now. I don't know whether what I wrote could be regarded as declassified now, except the Super part is unclassified, that half a—I could give you a copy of it if you want?

Harkewicz: Okay.

Van Dorn: I have a printed copy of it here, probably.

Harkewicz: I took us off track here. I'm trying to wonder . . .

Van Dorn: So, I'm not a typical Scripps-ite.

Harkewicz: Yeah. Exactly. Well let me ask you this, though. You wrote this, in your little biography, about John Isaacs but you also said, "He excelled at manipulating people, including Roger Revelle and Walter Munk, themselves skilled

manipulators." And I wondered about that word, "manipulators". Can you describe why you used that word…

Van Dorn: Getting what he wanted in face of opposition.

Harkewicz: You didn't mean that in any kind of pejorative way, then? It was just sort of a "getting their way."

Van Dorn: Well, it was a subtle jab. *[Laughter]* I remember one particular thing. John Isaacs was asked to give a talk to a very distinguished organization and I forget the occasion, and he didn't want to do it. So he asked Walter if he would help him out with it. And at the last minute he couldn't go and Walter had to go and give the talk, *[laugh]* you see. *[Laugh]*

Harkewicz: I see.

Van Dorn: Of course, John had no intention of going.

Harkewicz: Ah. Very clever.

Van Dorn: He just wiggled around. *[Laugh]*

Harkewicz: Okay. All right.

Van Dorn: Now, Roger was a different kind. He was a person that was very taken with people or else he just didn't have anything to do with them. I was a person he wouldn't have anything to do with. I was a social butterfly in his opinion. He often said Bascom and I should have been artists.

Harkewicz: What does that mean, though? *[Laugh*]

Van Dorn: Well, he didn't think we had scientific acumen to be researchers.

Harkewicz: Oh.

Van Dorn: But then, he never read a paper I wrote. But luckily I had almost no association with Roger. In the early days he'd come to all our parties and had a wonderful time. And then we entertained all the UCSD recruits, and so he used me in that effect, as he used Leonard Liebermann[25] and a couple of other people. But I had very little contact with Roger.

Harkewicz: Do you think that's why you were more involved with UCSD people than Scripps people later on? Perhaps?

[25] Leonard Norman Liebermann (1915-), professor of physics at UC San Diego.

Van Dorn: No. I don't think it had anything to do with that. It's just that, aside from the very earliest student groups, when we were very convivial, we drank an awful lot. *[Laugh]* But later on most of the students here just didn't drink, or didn't—when we were in Del Mar we had a beautiful home and one by one I invited everybody at Scripps who I knew there to dinner, once or twice, maybe three times. The only one that ever responded was Ed Goldberg,[26] and he was one of the original guys here. So we just never got to be good friends. A good friend was Russ Davis. He took over my job as chairman. And he moved in across the street from me in Del Mar about ten years ago, and we got to be good friends.

Harkewicz: What did, what kind of stuff did you do when you were off for, you know, off in the Pacific then? I mean, did you have friends at . . .

Van Dorn: I always had a crew of guys. I had a semi-permanent close group of four or five guys. An electronic or a machinist, and then I had two or three other guys that just were along to help us dive, do the diving and maintain the diving equipment. We always had a boat, wherever we flew. We had blanket orders. We could take our boat and two tons of stuff, put it on any military plane and fly it anywhere in the world, and with high priority.

Harkewicz: But did you hang out with these kind of, those people, then? I mean . . .

Van Dorn: No.

Harkewicz: No? It was all business?

Van Dorn: They were always my employees, my crew, you know. They worked for me. One of them was a boyhood friend that I'd known all my life. Which reminds me, did you talk to Dick Mead?[27]

Harkewicz: No, I have not.

Van Dorn: He's the longest lived technician at Scripps. He was the principal marine technician for many, many years, and he was a boyhood friend. I got him a job at Scripps, as I got my other friend. They were kids I ran around with in La Jolla. By that I mean we all came together in the summer and went away the rest of the year.

Harkewicz: I see. Yeah.

Van Dorn: And there's, one of them here. *[Shows picture.]*

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[26] Edward D. Goldberg (1921-2008), professor of chemistry at Scripps Institution of Oceanography.

[27] Richard Vance Mead (1918-) and William Van Dorn first met around 1938 when their families vacationed in La Jolla. After Mead completed his wartime naval service, Van Dorn told him that Roger Revelle was looking for marine technicians at Scripps Institution of Oceanography and Mead got a job there in 1948.

Harkewicz: Oh, wait. I see.

Van Dorn: The guy with the spear.

Harkewicz: Yeah. Okay.

Van Dorn: He was one of my principal guys all those years and finally in '65 I had to let him go because I didn't have a contract for a year. I was just doing experiments to keep this crew. I wasn't writing anything up. So I just took a year off and wrote three papers. I got him a job with Chip Cox, but he declined it and he went and he got a job with the company that did all the electronic firing controls for the proving grounds. It's called Edgerton, Germeshausen & Grier. EGG, everybody called it. Huge company now. But he got a job with them as their field rep, a sales rep out here, and somehow it didn't work out. He had an office in La Jolla and he dropped by. But that failed and then he went into one thing and another but he never came back, and then he died in '78. He wouldn't come around and see me anymore. He was very bitter about being let go after twenty years. But Dick Mead is still here and very valuable, *[laugh]* personable, a Princeton graduate.

Harkewicz: I wanted to ask you, before I forget about that, you know we were talking about your being "Mr. Tsunami," and you told me, when we talked on the phone, about this Tsunamis on the Moon Project that you're currently involved with. But I know that you wrote a paper in the sixties about it and no one accepted that at the time?

Van Dorn: That's right.

Harkewicz: And I wondered what that was like to feel like you have some sort of scientific contribution to make and then, but you can't convince other people?

Van Dorn: Well, it was my most exciting discovery, I think. I discovered that the Wave Theory fitted the rings on the moon, perfectly, and that it couldn't possibly be an accident. They had to be liquid at the time. But how could it be? Everybody at that time thought the moon was cold and had always been cold, and they even argued whether there had ever been lava on the moon. That was before the astronauts. And then the Apollo program came and went, but I was in other things, and it wasn't until three years ago it was suddenly announced that a team at SRI, at Colorado. It's the Southwest Research Institute. Robin Canup[28] is the principal investigator. She's a girl. And that she was able to work out a computer program, not alone, and a lot of people had worked on this, which was convincing everyone that a big object had hit the earth, knocked a piece off, which became the moon. Suddenly, instead of being a cold object they knew that it was highly likely that the moon was completely molten in the beginning. And I said, "Aha!

[28] Robin M. Canup (1968-) has a PhD in astrophysics, planetary and atmospheric sciences from the University of Colorado. She joined the Department of Space Sciences at SRI in 1998.

Now maybe I can prove what I guessed at." And I've been working on that for three years now, having one insoluble problem yet, and that is how did it, how did it freeze? *[Laugh]*

Harkewicz: All right. But, was it frustrating to you at the time to have this idea and not have it be accepted?

Van Dorn: Oh, it was, I've got a whole folder of headline news in *Science*, you know, *London Times*, all the big papers in the country. Scripps had, I think, a small headline, "Scripps Aide has New Theory." It didn't even mention my name. *[Laugh]* But, it was very big news and the physicists loved it. I gave lectures all over the country.

Harkewicz: In the sixties?

Van Dorn: And I got even invited to give a C.P. Snow Lecture at Cornell, and several other places. But then the Apollo came and nobody had ever read my papers, it turned out, and when they read, and they're all mostly geologists that worked on this, geologist and the geo, and whatever they're called, people like Gustav, geochemists. Well, geologists don't understand fluid mechanics and you had to know a lot of fluid mechanics to understand the Explosion Theory, and the way the waves are made and propagate. So it still is this that way. Everybody says, "Yes, there's lava," but nobody agrees exactly how far the moon was melted, or how, the process by which it cooled. There are many theories. But they don't agree very well. And I found a bunch of them that I can put together in, I think, a convincing sequence, except for the freezing. That has got me stumped and I don't know what I'll do and I may just have to let it go. I can't prove it no matter what. And I live in a different age now. I lived in an analytic age where people wrote equations. Now they write an equation and they put it in the computer and as Carl Eckart,[29] our foremost theoretician said, "A big enough computer can prove anything." And that is the opinion a lot of people have about how the moon originated. They tried for ten yeas and they finally found a computer code that would leave one moon. They got thirty, fifty moons, and they finally boiled it down to two moons, and then one moon. So you see, if you keep tweaking the system you can get the answer you want. Whether that's real or not remains to be established.

Harkewicz: I see.

Van Dorn: Well, I don't know how to do that sort of thing. I don't know how to write a code. Of course, that's the way bombs are designed, too. I mean, nuclear bombs are designed by codes. Computer code, trial and error. That's why it was so hard for Edward[30] to decide about the first one, about how much energy it had. See, an atomic bomb, if it's really, really efficient, only generates about four percent of its

[29] Carl Henry Eckart (1902-1973), physicist and director of Scripps Institution of Oceanography 1948-1950.
[30] Edward Teller.

thermonuclear energy when it explodes. The rest of it's just blown apart. For the first one, Trinity, they had no idea what it was going to do. It went twenty kilotons. It was a total guess as to whether that would work.

Harkewicz: Now you weren't involved in that, at all, were you?

Van Dorn: I was just after that. I remember when Alvin Graves[31] died because he accidentally dropped a bar of plutonium through a stack and a fragment hit it and it collapsed.

Harkewicz: Yeah. What was it like to be there at that time? Was that, did everybody know about that?

Van Dorn: Oh yeah. He knew it instantly.

Harkewicz: No, but I mean, was it like common knowledge to the, everybody that worked at—

Van Dorn: Everybody in the community, yes.

Harkewicz: Did you realize at the time what you were working with?

Van Dorn: In fact, he is one of only three people who have ever died from radioactivity.

Harkewicz: Yeah.

Van Dorn: That I know of.

Harkewicz: I mean, were people really worried about what they were working with at the time?

Van Dorn: The people working on them?

Harkewicz: Yeah. I mean, or was it just another scientific thing that you were working on, so you just saw it that way?

Van Dorn: You mean, was I concerned about the moralistics of developing it?

Harkewicz: Well, no, not so much, just your own safety, I guess, or the safety of everybody?

Van Dorn: No. We swam in the crater the day after they shot them. I mean, water's opaque to radiation. So once you're under the surface the only thing you had to worry is not to swallow it, or get it on your clothes. You took a shower afterwards.

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[31] Alvin C. Graves (1912-1966), the scientific director of Operation Castle, was present in 1946 at a laboratory accident at Los Alamos on May 21, 1946 that proved fatal to Louis P. Slotin (1910-1946). Dr. Graves died of a heart attack twenty years later.

[Laugh] We all wore badges, and they analyzed the badge every week to see how much, what your count was. If you got more than a hundred mR on your badge you were sent home for three months. That was the Task Force standard. And the guys who didn't like being out there would walk on radioactive stuff and then step on their badge *[laugh]* so they'd get sent home. *[Laugh]*

Harkewicz: Seriously? Really? Gees. *[Sigh]*

Van Dorn: It was a strange scene, anyway.

Harkewicz: I guess so.

Van Dorn: You know, 12,000 people living on one little motu, scattered to the winds to work on all these different things, twenty-four hours a day every day of the week for nine months to get this job done.

Harkewicz: Did you ever have any interactions with the local people at all?

Van Dorn: The natives?

Harkewicz: Yeah.

Van Dorn: No. They were all moved away. They did it rather arbitrarily and the natives didn't like it. And still didn't like it. It turns out that the natives on those islands are like the Indian tribes in America, always at war with their neighbors. I mean, the whole, Oceania was like that. Even the guys that had a common genetic structure totally, you know, like the Marshallese. So to stick all the inhabitants of this island on that island it just doesn't go. They have no land, no property, no rights. Of course, the king owns all the land. But it didn't work out. They never stopped wanting to go back. And they still can't go back. And they could go back for a week or a month, maybe a year, but, because everything's covered in concrete, but the craters are still there. Actually, you can get on Google Earth and look at the craters. It's kind of interesting. The big ones.

Harkewicz: I'll have to do that some time.

Van Dorn: You can see Mike crater. You can see Bravo, all the ones from . . .

Harkewicz: I'll have to do that sometime.

Van Dorn: At least four you can see. I've looked at them. I mean the Mike crater was 6,000 feet across, 150 feet deep. Beautiful thing, to fly over in an airplane. *[Laugh]*

Harkewicz: Okay, I guess I will have to. I don't know if you want to say what your ideas about the moral implications of the atomic bomb are, but maybe just, was it just such a scientific achievement to you?

Van Dorn: Well, I recently saw . . . I forget. What was it? I think it was on the History Channel. Was it—not Modern Marvels. It was something else. It described the history of armaments since the beginning, and . . .

Harkewicz: You mean, like sticks and stones?

Van Dorn: They always were used and to full effect. Nobody ever turned down armaments, ever, on moralistic grounds. But now we have not used this armament for sixty years. That's a record throughout history. So moralistically you're down to whether we were justified in dropping two on Japan? I don't even want to go into that.

Harkewicz: That's fine. *[Laughter]* That's fine. We don't have to stir anything up or anything.

Van Dorn: But it's hard to find a guy who was out there who doesn't think it was okay.

Harkewicz: Yeah. Or people that were involved in the war effort, yeah.

Van Dorn: And I've been down there, in Japan, and seen that area. Actually, one of the most prosperous parts of Japan now. *[Laugh]*

Harkewicz: That's ironic, isn't it? *[Laugh]*

Van Dorn: Well, it takes a huge disruption, like the San Francisco earthquake, to build a . . .

Harkewicz: To rebuild things, yeah.

Van Dorn: A better city than there was.

Harkewicz: Yeah. You're right.

Van Dorn: And look at, New Orleans now.[32] It'll probably turn into a bustling metropolis.

Harkewicz: Well, okay, now that brings up a question that I have written down here about all your work in tsunamis. I wondered what about what you about the Indonesian tsunami that happened a couple of years ago? And I know you worked on all these warning devices. [33]

Van Dorn: Well, you see, a great deal of this is public hubris. Yes, we should have done this now, put in a bunch of warning meters. There had never been a tsunami in Indonesia since Krakatau erupted in 1883. And nobody knew that the Sunda

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[32] This is a reference to the catastrophic damage to New Orleans caused by Hurricane Katrina on August 29, 2005.
[33] This is a reference to the December 26, 2004 undersea earthquake in the Indian Ocean that triggered a devastating tsunami.

Trench was volcanic, seismically active. And I mean, seismically active areas are continuously emitting little earthquakes all the time. Well, there had been a lot of little earthquakes in that area but no medium or, for a hundred, you know, within recorded history of seismology. Suddenly it gave way, the biggest one ever. And followed by another earthquake almost as big, that didn't even make a tsunami. So there's a question whether the ground moved this way or it moved that way? The Alaskan earthquake was another of my big triumphs and I was on the first plane after that. Because, this is on straddled land and the ocean, and now we had a way to find out really what caused that tsunami and how it behaved, which I did. I wrote four or five papers about that. And President Johnson appointed a whole committee of the National Academy and they wrote twelve books on that earthquake. I was editor of most of the tsunami papers. And it was very obvious what happened, because we could, you could measure where the land had gone up and where it had gone down. It was all very shallow. And it was just like the Earth had done that.

Harkewicz: Which is?

Van Dorn: The part that went up was out on the shelf, and...

Harkewicz: You're clasping your hands there.

Van Dorn: …and the part that went down was under Anchorage and around that area, the Columbia River fiord, and the Prince William Sound.

Harkewicz: But that's a pretty active area, isn't it?

Van Dorn: Still is. Always has been. Continuously. I mean, you can tell it's a submerging coastline because of the fact that trees grow right down to the water's edge and it's all steep and mountainous. And the islands, the Aleutians are all volcanoes. In fact, from here, I guess the southernmost one is Mt. Shasta. Well, it's all volcanic here, east of there, and it becomes a volcano at Shasta. And then there's just a whole line of volcanoes off shore. And that line more or less continues through British Columbia. It switches over and forms the Aleutian arc. So these volcanoes, I mean the big earthquakes sort of occur one after the other in a counterclockwise fashion, in the Pacific and around Japan now, having started in Chile in the last century. Now maybe this Indonesian one was the next step.

Harkewicz: I see. So after you came back to Scripps as an emeritus professor, did you do this kind of work on tsunamis and that kind of stuff then?

Van Dorn: Yeah. I wrote my best paper, in fact, in '90, '87 I think, or '86, or '85, on tsunamis. I showed that, how they decay and it was depending on how wide the shelves are, that most of the energy dissipates on the shelves, sloshing. And the big basins act as storage.

Harkewicz: Who funded that kind of work? Was that National Science Foundation?

Van Dorn: I got a grant from ONR.

Harkewicz: So at that time did you have to get your own funding then, or were people still looking for you?

Van Dorn: No, I got all my contracts after that. In fact, I really left, gave up my office when I wrote five proposals and couldn't get funding. I moved into my house in Del Mar and worked from there. I wrote three papers since then and they've all been published. But they're in a different field, in physiology, biophysiology.

Harkewicz: Really?

Van Dorn: Yeah.

Harkewicz: How did you get involved in that?

Van Dorn: One's in cold water survival. When I was writing my book, *Oceanography and Seamanship*, I thought that the basis for the Coast Guard's prediction of survival of cold people was very scientifically unsound. So I wrote a much better paper on that.[34]

Harkewicz: Did you do any kind of experimentation for that?

Van Dorn: Yeah. I filled a big plastic bag up with hot water and put it in my swimming pool *[laugh]* with a light bulb in it and measured its rate of cooling. That's how I proved my theory. It worked perfectly.

Harkewicz: I see. Okay. So this, this interest about the tsunamis on the moon, was that your only space-exploration-type interest or did you have other ones out of that?

Van Dorn: Nothing more on space, except this last one. Although I wrote another paper I didn't publish, on the cooling of the moon because I found a better paper. I mean, one which had involved the crystallization and heat exchange of the thing, of the crystal as it crystallizes, which I am not cognizant of. I wrote mine and as if it were a bunch of sandwiches, of layers of different conductivity.

Harkewicz: Okay. So, now you've written these things on biophysiology and it sounds sort of like you have an idea that, or something that you disagree with maybe and you decide to do your own investigation of it? It's not necessarily that it's something—I mean, you've done all this work in tsunamis, but I guess I'm not really sure how your biophysiology interest got . . .

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[34] W.G. Van Dorn, "Thermodynamic Model for Cold Water Survival." *Journal of Biomechanical Engineering: Transactions of the ASME* 122 (5): 541-544 (2000).

Van Dorn: Things come up in a funny way. When I was writing the cooling and survival paper I wondered how much energy humans could put out, and there was no, really no good evidence about that. So, I wrote the . . .

Harkewicz: Careful you're, you're . . .

Van Dorn: I want to take this off for a moment. *[Mike noise]*

Harkewicz: Okay. *[Laugh]* Dr. Van Dorn is getting some information to show me so he's disconnected himself temporarily.

Van Dorn: This is my life's work. This is the last one. *[Turning pages]* This is the survival one. I calibrated it also with an accidental capsize of a boat where everybody drowned, except one guy and he kept a record of all the other guys hanging on to a door. And he had a wetsuit and put it on. So he survived.

Harkewicz: Now is this another one of your faction-type things, then?

Van Dorn: This is the survival one.

Harkewicz: Okay. But this, this idea that you had, this, with this one person surviving, that was just a . . .

Van Dorn: No, that was a lucky coincidence.

Harkewicz: A scenario? Or was it a real-life thing? Somebody . . .

Van Dorn: I had done the swimming pool thing first and then this accident happened and so I went and interviewed the survivors, relatives, and it was a way of testing and it worked. Now where is that stupid thing? *[Turning pages]* I got it. There it is. And that's a wonderful paper but nobody understands it. *[Laugh]* But maybe somebody will someday and they'll become famous.

Harkewicz: Okay. This is called "Equations for Predicting Record Human Performance in Cycling, Running, and Swimming."[35]

Van Dorn: How much heat do people put out? How much energy?

Harkewicz: It sounds like exercise physiology then. You should get . . .

Van Dorn: All I did was take the Guinness Book of Records and plot the winning time against the distance of the race, and it turns out they fall on exactly logarithmic lines.

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[35] W.G. Van Dorn, "New Racing Equation for Championship Performance." *Journal of Biomechanical Engineering: Transactions of the ASME* 122 (5): 545-547 (2000).

Harkewicz: Interesting.

Van Dorn: And then when it came to energy I had to find some—this is just, you don't know how much energy they're putting out but obviously the swimmers put out more. They'll swim as fast as the runners and they don't as fast as the cyclists, but they'll put out the same energy, it turns out. So I went to the two experiments that had been done, flying across the English Channel in a man-made-powered device and across from Crete to Egypt, a Daedalus and an Albatross experiment. They carefully calibrated the amount of energy these guys were putting out against how long they put it out for. And of course, they had to put out maximum energy to stay up. It was a careful balance, because how long they, depending on how long they could do that. But that's the interesting part, you see, how long can they go? Well, they have to, these lines are straight. That means if each guy is budgeting, is putting out as much energy he could possibly do to win this race, but this guy is doing the same thing way out here, but he's using a little bit less energy because he'll go a lot farther. Now the biophysiologists at UCSD are working on this problem, finally.

Harkewicz: And have they come to you to talk about this at all, since you've done this work?

Van Dorn: No, they don't ever do that. *[Laugh]* The only people who ever call me, "There's a tsunami coming. Help!"

Harkewicz: I see. Okay. That brought up another question. You mentioned that you have been an expert witness in some legal cases.

Van Dorn: Oh yeah. Lots of marine accidents. Marine casualties, mainly.

Harkewicz: On stuff like this, this physiology stuff, have you testified, I mean, what have they sought you out for?

Van Dorn: No. Most of that is defending municipalities against people who are injured diving into the water or falling off a rock. Absurd things. Or going out dangerously in a boat, or not utilizing proper caution in operating a vessel, things like that.

Harkewicz: So it's more because of your book that you wrote about *Oceanography and Seamanship*? I see.

Van Dorn: I don't know. People are having a picnic and a guy dives into the Bay, hits his head on the sand, and sues the city. There was no sign posted saying it was a dangerous place. *[Laugh]*

Harkewicz: I see. Okay. I guess the water's a dangerous place. You've got to figure it's dangerous.

Van Dorn: Water's dangerous.

Harkewicz: That's right. *[Laugh]* Oh. I have another question here about your "Van Dorn Effect" and I wondered why, if you could tell me why it's so important?

Van Dorn: Well, one of the things that the Defense Department was interested in *[phone rings]*— get that Jane? *[Pause]* As soon as it became evident that I could predict the waves that were produced by big explosions, no matter where you put them, they immediately wanted to know specific objectives, what would happen. So for ten years, that was too big a job for me to tackle, so I had been consulting for about five years for a company which has reestablished itself in Pasadena.[36] And so they took on the contract of doing these calculations and they hired a couple of Los Alamos guys from the Tamarin Committee, who were computer-types. Computers were just getting big. And it was all done with computer codes, propagating the waves over various topographies, seeing how far they would run up on the beach. Well, it became pretty evident about 1965 that the waves never got to the beach. They would break out on the shelves. But it also became apparent that, they were talking about waves breaking in 600 feet of water, so this was inimical to shipping. I mean, it was immediately obvious to me. So I wrote a confidential classified report to the Department and said, "The danger from explosions in deep water is not that the water runs up on the shore but that it will sink every ship on the shelf." And that was called the "Van Dorn Effect." That immediately became a subject of great concern, and most of these calculations of effects were concerned with sinking Russian submarines, or our submarines, if they got to too close to the shore. And the reason it got to be unclassified, inadvertently it appeared in the *Congressional Record laugh]* in '71.

Harkewicz: But something like that, I mean, that's so important, it doesn't seem like it should be classified . . .

Van Dorn: Well, at that time they were talking about, "What do we do, how would we deploy our MX missiles?" These will go any distance and carry any size warhead. And they were thinking of putting them in mini subs and having them go along the coastline, edge of the shelf. Or maybe the enemy was going to do the same. And this discovery of the Van Dorn Effect immediately made, forced them to discard that option, which was a pretty big, significant option.

Harkewicz: That's good they listened to you then, I guess.

Van Dorn: But nobody came to me and thanked me. *[Laughter]*

Harkewicz: So when did you actually finally really retire, then?

Van Dorn: I'm still working.

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[36] Tetra Tech Inc. in Pasadena, California.

Harkewicz: So, you never really . . .

Van Dorn: I've never retired. I only work three or four hours a day now. I take a lot of naps. *[Laugh]*

Harkewicz: Doesn't sound so bad.

Van Dorn: But right now I'm stuck on this lunar tsunami freezing problem, and I don't know if I'll solve it or not, but I'll keep trying. If I do, I'll be a hero all over again.

Harkewicz: And it's not something you'd want to, you know, you said nobody ever comes to you to talk to you, it's not something you'd want to go out and talk to somebody else about to try to get ideas from them? You'd rather do it yourself?

Van Dorn: Well, that's the interesting thing about science; once I know the answer I cease to be interested in it. *[Laughter]*

Harkewicz: Okay.

Van Dorn: I'd rather not travel around and talk about it.

Harkewicz: I see. Well, that's interesting.

Van Dorn: Although sometimes I have daydreams about being awarded a prize or something like that, or being appointed to the National Academy. I never won any medals, because nothing I've ever done is in the public eye, except the lunar tsunamis, and that died pretty rapidly.

Harkewicz: Well, that brings me back again to that question I asked before, though. I mean, do you feel sad or anything about that at all? I mean that you did all this work. You've really, you know, contributed a lot but nobody knows about it.

Van Dorn: Well, I couldn't prove anything different, but then when I found out the moon might have been hot I picked up the trail all over again. I've been working like hell on this for three years. There's a pile of the references. Thanks to Google, I don't have to even go to Scripps. *[Laugh]* So I learned a lot about what other people think the moon is like. I just came back from a physics meeting in Hawaii, American Physical Society. It was about impacts into the moon, and other kinds of impacts. Mostly weapons. Meteorites. And they're finding evidence of impacts on the Earth, too, which they didn't think would be around anymore. But they're finding about forty or fifty of them now in places where big meteorites hit the Earth. Of course, the one that killed the dinosaurs they had to dig out piece by piece. That's a very big discovery. But those two poor guys from Berkeley, a

guy and his son, you know, who discovered it, from the iridium layer, Alvarez never got a thank-you note from anybody.[37] *[Laughter]*

Harkewicz: I guess if you're a scientist maybe you're not supposed to expect a thank-you note, huh?

Van Dorn: Well, the finding it, the knowing it, is the thing. And you listen to all these other people who are wah, wah, wah, wah, and you say, "You can't fight that kind of wall. All you can do is publish a better paper." That's what science is all about. At least for me anyway, as Newton wrote, "The essence of discovery is protracted reexamination." *[Laugh]* I've been reexamining that moon problem for forty years.

Harkewicz: Yeah, I guess it's, if, you know have something worth studying if people keep questioning what you came up with, I suppose that's how you look at it in a sense? Or keep people . . .

Van Dorn: Well, they don't keep questioning it. They just ignore you. *[Laughter]*

Harkewicz: Well, it seems like this is sort of a good place to wrap things up here. So, I do have a few questions that I like to ask everybody, general comments. And these are directed towards your Scripps experience. Now I realize that you spent a lot of time elsewhere, but answer them as best you can. First of all, I wondered what you think made Scripps successful?

Van Dorn: Oh, well, it was just a little Podunk biology station until World War II, and then Walter and Sverdrup's discovery that you could predict the waves on the beaches saved a lot of lives, and that, you might think would, it aroused a lot of interest in the Navy, but the person that made it go was Roger, who was working in ONR when it was established. And he was pushing that end of it hard. He had got his degree here in '36 and he wanted to be the director of Scripps. And the instant he got to be director of Scripps his whole attention was devoted to getting UCSD started. He never came to meetings, or he was always late. However, he did increase what was going on at Scripps by orders of magnitude, by bringing in groups of various—he was very interested in the carbon dioxide problem from way back. So mainly he invited people who would work on that problem, Keeling[38] and a dozen others, Scholander,[39] and some Visibility Lab. He brought all the physicists up from Marine Physical Lab down there and stuck them up

[37] Walter F. Alvarez (1940-) and his father, physicist Luis Walter Alvarez (1911-1988) investigated a worldwide layer of clay that has a high iridium content and which occupies rock strata at the geochronological boundary between the Mesozoic and Cenozoic and suggested an asteroid impact as the possible cause of dinosaur extinction.
[38] Charles David Keeling (1928-2005), chemist and climate scientist who was affiliated with Scripps from 1956 until his death.
[39] Per Fredrik Scholander (1905-1980), Swedish born Norwegian physiologist, arrived at Scripps Institution of Oceanography in 1958 and founded the Physiological Research Laboratory there in 1965.

here, Leonard Liebermann and Fred Spiess.[40] He brought Isaacs down from Berkeley. And my original job was to look at the deep circulation of the ocean, but I finked out on that. *[Laugh]* And so he did a great deal for Scripps in that event that he invited all sorts of people and built buildings for them, and gave them good jobs, and always bragged about how little he could get people to work for because they could live in La Jolla.

Harkewicz: As far as payment goes, you mean?

Van Dorn: Yeah.

Harkewicz: So you'd say that people he brought in found ways to make Scripps useful to other people? Would that be safe to say, something like that?

Van Dorn: He wanted to solve the carbon dioxide problem, but he also was interested in a lot of different things. He invited a famous geneticist from Italy, Adriano Buzzati,[41] and a lot of biologists, and chemists. He wanted to expand all aspects of oceanography, I would say, but he was mainly interested in carbon because he wrote his thesis on that. So, he wanted it to be a famous place and he brought in top-notch people, and he tried to do the same thing at UCSD. He wanted to start at the top and go down, so he brought in a bunch of Nobel laureates and stuck them in there, and was terribly disappointed in his later years because it wasn't putting out Nobel laureate students. Like one of our only ones was a guy that invented PCR, and he was just an engineer, I mean a lab assistant. *[Laugh]* He got the Nobel Prize.

Harkewicz: But what about in later years, after Revelle left? What do you think made . . . .

Van Dorn: Well, he wasn't here very long. Five years. And . . .

Harkewicz: Do you think that Scripps has not been as successful since?

Van Dorn: No, I don't think that. It continued—Nierenberg[42] was a, well he was, in my opinion, by far our best director because he was always at meetings and he was a prominent physicist in his own right, a pretty bright guy. But, as I say in my report his politics are just slightly to the left of Attila the Hun. *[Laughter]* But he liked me and he was the only director I really knew well. We had social—he and

[40] Fred Noel Spiess (1919-2006), professor of oceanography at Scripps Institution of Oceanography. He served as director of the Marine Physical Laboratory from 1958-1980 and of the UC Institute of Marine Resources from 1980-1988.

[41] Adriano Buzzati-Traverso (1913-1983), Italian geneticist, visited Scripps Institution of Oceanography in 1953 and worked with Roger Revelle on a successful proposal to the Rockefeller Foundation to strengthen biology at Scripps. The resulting million dollar program resulted in a symposium, Perspectives on Marine Biology (1956), and the recruitment of new faculty in biology at Scripps.

[42] William Aaron Nierenberg (1919-2000), physicist and director of Scripps Institution of Oceanography from 1965 to 1986.

Harold Agnew and I, and the chancellor, Galbraith[43] *[phone rings]* were always getting together and we were all buddies. Anyway, he was very successful in building, and continuing the build-up. And I was the head of the Planning Committee, where buildings should go, and of course nobody every paid any attention to what I recommended. *[Laugh]* But I did build a big topo map of the whole hillside there and they could imagine planting buildings here and there. But it never turned out that way. They always ended up in a dense cluster. It's the most horrible place in the world, aesthetically I think, Scripps.

Harkewicz: Really? *[Laugh]*

Van Dorn: They jammed two buildings this far apart and they put another one right between them. There's ten feet between the walls. You look into somebody else's window. It's just absurd, because it was a beautiful place when I went there. And it gradually got worse and worse.

Harkewicz: Because it got more and more crowded?

Van Dorn: Because of the high density. I don't know about the poor students—they can't park anywhere.

Harkewicz: Well then, that sort of leads into the next question, which is: what do you think has threatened Scripps' success?

Van Dorn: What's threatening it?

Harkewicz: Yeah.

Van Dorn: You know, I'm not connected enough to it to know what who feels threatened by what.

Harkewicz: Well, I mean, or in the past, if you've seen things that maybe have harmed, endangered its success?

Van Dorn: Well, it's always been like a bunch of little teeny Indian tribes. These people Roger would bring in would form their own thing and nobody ever spoke to each other, and they would always fight vigorously over omnibus grants. So it's a very disparate community, with a lot of nests of rivalry and each guy doing his own thing, me most of all. *[Laugh]*

Harkewicz: You think that was always the case, though?

Van Dorn: Yeah. It always has been. Each guy would start his own tunnel and dig it, and fend off all adversaries.

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[43] John Semple Galbraith (1916-2003), Scottish born American historian, served as chancellor of UCSD from 1964-1968.

Harkewicz: Doesn't sound very community-oriented.

Van Dorn: The hardest thing that every director's had to face is to get some kind of community agreement. This new director, I've never met him. Haymet is trying desperately.[44] He has these meetings where he says, "Come and talk to me. Come and talk to me." I don't know if they do.

Harkewicz: I don't know either.

Van Dorn: He's from Australia.

Harkewicz: Uhm-hmm.

Van Dorn: He's the only one, guy I've never met. I knew all the other directors. I knew every chancellor up until—I guess the last one I really knew well is Bill McElroy.[45] He's the last chancellor I knew well. He was superseded by Bill somebody or other, whom I didn't know. Scripps had got too big then. That was about '66. I knew everybody in the first college and most of the people in the second college, in science anyway. And so it never went beyond that.

Harkewicz: Well, that's still pretty impressive. *[Laugh]*

Van Dorn: Now you just can't find anything up there. And the damn library in the middle of nowhere. You can't get to it without walking half a mile.

Harkewicz: Yeah. That's true.

Van Dorn: That's absurd. *[Laugh]* But then, you don't need libraries anymore.

Harkewicz: That's true, too. Yeah. With new computers.

Van Dorn: Ours just sits empty.

Harkewicz: Yeah.

Van Dorn: And, you know, that's the funny thing . . .

Harkewicz: It's real nice to be able to get journals from . . .

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[44] Anthony Douglas-John (Tony) Haymet (1956 -) became the tenth director of the Scripps Institution of Oceanography in 2006.

[45] William David McElroy (1917-1999) was a biologist and director of the National Science Foundation when he became chancellor of UCSD in 1972. He succeeded psychologist William James McGill (1922-1997) and was succeeded by chancellor Richard Atkinson (1929-) in 1980.

Van Dorn: I can't understand our city council endlessly debating where they can put their new giant library downtown. Nobody's going to go down to the library downtown. *[Laugh]*

Harkewicz: They should probably put it out near the mall, or something like that?

Van Dorn: In the first place, people don't read anymore. That's the first thing. College students read. And I guess this is not too bad for a college student because they don't mind walking a mile, or ride a bike. When I went to Stanford the library was right in the middle of everything, easy to get to.

Harkewicz: Well they arranged colleges different, or universities different at that time than they do now.

Van Dorn: Stanford's having the same problem, though. My best friend was dean, the fifth dean of engineering. I was a freshman with him. We lived together. I went up to see him recently and he took me all around the campus and the original quadrangle is there and it's just as lovely, but it's just surrounded by a sea of miscellaneous hodgepodge of buildings.

Harkewicz: Well then, they, you know, they start going outward and things are not quite as organized as originally planned.

Van Dorn: But at Scripps, there's nothing left but the Old Scripps Building.

Harkewicz: Yeah. Okay, then my final question to you is, "What has Scripps meant to you?"

Van Dorn: I think I expressed it in my first paragraph in my paper, better than I could ever say again. I came at a time when it was wide open. Everything you did was new. I had no boundaries, no boss, unlimited support. I had a most marvelous time in my life and I felt as lucky as hell to have been able to do it, and now you can't do it anymore. It's a bitter battle now.

Harkewicz: Yeah. And why do you think that is?

Van Dorn: Pardon?

Harkewicz: Why do you think that is?

Van Dorn: Because it's so big and the guys I still know well, that live there, that are on the verge on retiring, spend all week writing proposals and try to do a little research on the weekends. They have to teach, too, which I luckily didn't have to do. I did teach some things for University Extension. On occasion I taught classes.

Harkewicz: So, it's just gotten too big and too hard to get money?

Van Dorn: Well, I was lucky. I had a research appointment, you see. It didn't involve teaching. Roger got the university to give him five full appointments, full-time appointments, and he split three of them up, gave two full-time appointments, one to Bob Fisher,[46] who's mapped every inch of the bottom of the ocean, the most dull unimaginative job you can possibly imagine. *[Laugh]*

Harkewicz: I spoke with him. *[Laugh]*

Van Dorn: He loves the bottom of the ocean. *[Laugh]*

Harkewicz: So you find your niche, I guess.

Van Dorn: Who was the other one? I got an appointment that had been given to somebody else who was not performing, so I was lucky to have it. I got a half-time appointment. I had to earn the other half.

Harkewicz: And is that how you, you got it from like the ONR and stuff like that?

Van Dorn: I never had a problem. I never had a problem getting money until I'd been there thirty, forty years. I was an old fossil then, *[laugh]* you know. The computer age had come in. But Walter's always prospered. He still runs everything. Has a beautiful office.

Harkewicz: That's true. Well, I guess I will not take up any more of your time. Is there any final word you have for posterity that you'd like to share with anybody? Anything you've always wanted to say about stuff?

Van Dorn: Well, having had such a singular experience I can't really offer advice to—I had four students, graduate students.

Harkewicz: I didn't realize that.

Van Dorn: And only two of them prospered. One I flunked and another one was cheating—it was a Chinese kid—falsifying data. And one of them worked with me for a year or two and then went off and worked on oceanographic data. He was a physicist turned oceanographer. Then he went away by himself into industry, and the fourth one became an NSF program director. So if I had advice to offer somebody I would be at a loss because he couldn't duplicate what I did. I can't conceive of a mechanism for that. And they don't give away research appointments anymore. And I would just say to a student to go to the guy you most admire in the field you're interested in and become his indispensable assistant. *[Laugh]* That's what I would advise.

Harkewicz: Well, that sounds like a good place to stop.

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[46] Robert Lloyd Fisher (1925-), American geologist and administrator at Scripps Institution of Oceanography where he received his PhD in oceanography in 1957. Fisher initiated and led many expeditions around the world.