Marlin_Thomas Interview by Mark Lawley, October 23, 2017, Houston, TX

Early Life

MARK LAWLEY: Good morning, Dr. Thomas.

MARLIN THOMAS: Yes, Mark.

MARK LAWLEY: May I call you Marlin?

MARLIN THOMAS: Yes, please do.

MARK LAWLEY: OK, well I've often noticed that you have a very interesting ring on your right hand. And I'm wondering if you can tell us a little bit about that ring and why you wear it.

MARLIN THOMAS: Yes, it's called the ring of life. And on the interior of this ring is the circle of life. And it represents all of the nations. And I descend from Cherokee. And this is a very important ring. It's got all of the symbols that represent the tribes. And for example, you'll see the turtle. And they have all of the symbols that represent the US. And it's very important to me.

And I received this from a friend, a very good friend of mine. And so I cherish this. And that's part of my heritage that I'm proud of.

MARK LAWLEY: Now, your family originated in the hills of Eastern Kentucky, I think.

MARLIN THOMAS: That's correct.

MARK LAWLEY: And that's where your Cherokee heritage comes from.

MARLIN THOMAS: Yes.

MARK LAWLEY: Can you tell us a bit about that?

MARLIN THOMAS: Well, I actually was born in Kentucky. But it's right where the three states intersect at Cumberland Gap. And we originally, most all of my family, came from originally in North Carolina. And that would be a lot of Scottish and Irish, which is primarily those that married into the Cherokee. And this is the Eastern Cherokee. And so you'll find that there was Cherokee in almost all of my great grandparents. And it's primarily the females.

I have one great, great grandfather, but other than that, they were all females that married into the Irish, mostly.

MARK LAWLEY: Right. Now, when you were younger and you'd spent time growing up in southeastern Kentucky, your family then moved to Michigan.

MARLIN THOMAS: That's correct, at age 10, my parents moved out of the coal mining area into Michigan, actually Monroe, Michigan. And there my father went into construction and I went through all my secondary education there. And from there, I went into the Navy, and then came back and earned all my degrees at the University of Michigan.

MARK LAWLEY: So how old were you when you began to realize that you were good at mathematics, and that you might follow a career along those lines?

MARLIN THOMAS: In the Navy, I sort of got more serious about education. And I had a lot of fun when I was in high school. But the Navy was a good bridge. I was very fortunate that I found my way through to be an engineer.

MARK LAWLEY: You were an enlisted man to begin with in the Navy. Is that correct?

MARLIN THOMAS: That's correct.

MARK LAWLEY: And what kind of things did you do?

MARLIN THOMAS: I was a radar technician. And actually lived on an aircraft carrier for four years. And it was outstanding. It was very analytical. And it motivated me to continue on and worked in air search radar. So that was my good fortune. And it also kept me-- most of my time at sea, so I stayed out of trouble.

MARK LAWLEY: Well, during that part of your life, the early part, when you were a young man, you were quite interested in athletics, I understand. Can you tell us some things about the athletic pursuits that you had?

MARLIN THOMAS: Well, I think during my era most people played football and ran track. I actually even played some basketball. And I got interested in long distance running. And that carried throughout most of my whole life. I ended up as a masters runner.

MARK LAWLEY: And you're still running today? Or you've relegated yourself to the gym now?

MARLIN THOMAS: Pretty much. As they say, if you keep going, sooner or later you're going to crash and burn.

MARK LAWLEY: Now, I think you were also a boxer, is that correct?

MARLIN THOMAS: Yes, I did. It was a lot of fun. I was in the Golden Gloves. I was pretty good with a left hook. I had to change weight to light weight. People were six inches longer, usually, in my reach. And that became a real challenge. It was fun as long as I was beating someone. But it was not much of a consolation when you end up with sucking soup through a straw, even though they tell you you won, it stopped being fun.

Navy, College and Graduate School

MARK LAWLEY: Now when you were in the Navy as an enlisted man, you told me of a couple of your exploits. One was diving off of a ship into the water. Is that right?

MARLIN THOMAS: Well, it took a little bit more time with the Navy before I stopped doing crazy things. But I actually jumped off of the flight deck of the USS Forrestal. I had a bet that we wouldn't do it. But I actually jumped together from the flight deck at 72 feet. I was sorry. It took me two weeks before I got my hearing back. And so I stopped doing that.

MARK LAWLEY: So when you left the Navy as an enlisted man you went to the University of Michigan. Is that correct?

MARLIN THOMAS: That's correct.

MARK LAWLEY: And what was your bachelor's studies?

MARLIN THOMAS: Bachelor of science in engineering. And I went through the co-op program, the university of Michigan Dearborn, and then to Ann Arbor.

MARK LAWLEY: So in the co-op program, who did you work with?

MARLIN THOMAS: In the co-op program, I'm not sure I remember the names. But there was a Jim Buck who was the engineering economist. And Adnan Aswad, he was actually my advisor.

MARK LAWLEY: Do you recall the companies that you worked with?

MARLIN THOMAS: Primarily Owens-Illinois. And I worked in Applied Polymer Physics for, I guess it was, four years.

MARK LAWLEY: After you received your bachelor's degree, did you go to work in industry? Or did you go directly to graduate school?

MARLIN THOMAS: For a short period of time. And then I received an invitation from the University of Michigan. And there, my advisor was Bob Thrall. And he then really guided me, very much so. And he told me that it was important that I don't become a drop out. Said, you had to go into the PhD program.

MARK LAWLEY: So you went into the PhD program working with him?

MARLIN THOMAS: Actually, no. He was the overall advisor. He actually wasn't on my committee. My primary advisor, initially, was Ralph Disney. And I always considered him my mentor. But he ended up having to change because he left, went to Brazil on a special assignment.

But then the committees that I worked with, Steve Pollack, Marv Karson. The faculty in general was very strong in OR. We're talking about the late '60s. And I finished my degree in '71. And so it was very interesting and extremely exciting area to be a part of.

MARK LAWLEY: Do you remember the title of your dissertation?

MARLIN THOMAS: It was something like, some probabilistic aspects of decisions. That's pretty close.

MARK LAWLEY: OK, and that's the line of research that you pursued throughout your career, is stochastic operations research?

MARLIN THOMAS: Actually, I was very interested in man-machine systems. And what my research was basically looking at the nature of responses under various conditions, crisis and analyzing it in terms of mathematical models. And it was interesting but, it was a little bit early. So the people in human factors and engineering psychology, they were not receptive.

So I ended up, basically, just doing my publishing in operations research and mathematical sciences.

MARK LAWLEY: Now, I think that you've been married for over 50 years to Sue Stoner.

MARLIN THOMAS: That's correct.

MARK LAWLEY: And you have two children?

MARLIN THOMAS: I have two, yes.

MARK LAWLEY: And you had those, I believe, while you were going to graduate school?

MARLIN THOMAS: Yes.

MARK LAWLEY: Is that correct? Can you tell us about how you met Sue and then about what it was like to have kids while you're going to graduate school?

MARLIN THOMAS: Actually, I thought it was quite nice because my son and my daughter is the oldest, and so we lived in student housing. And the culture was wonderful. We didn't have to-- we were very poor. Walt Hancock made sure of that. His theory was, if you starve your family, then you'll graduate sooner and get out of here.

My wife and I met before I got out of the Navy. And we actually went on a blind date and it didn't go so well. But then right after I got out, I came back and then we hit it off. And so like I say, it was an extremely great match. Still together and she's still my best friend.

Chrysler and the Seabees

MARK LAWLEY: And so when you finished your PhD, I think you did some work with Chrysler at some point along in there.

MARLIN THOMAS: Yes.

MARK LAWLEY: Can you tell us about your work with Chrysler?

MARLIN THOMAS: I had started my career at the Naval Postgraduate School. I was getting ready to leave

So I was invited to come to Chrysler and work on their reliability and warranty section. It was well known and they almost had to file Chapter 11. And so I actually was assigned to work on that problem. And so I spent just under two years. And it was part of turning the system around for estimating and predicting reliability problems through the warranty analysis.

It was very, very great experience, very, very tough experience. Actually ended up knowing, not real well, of course, Lee Iacocca, and later on, at Lehigh University and worked on his advisory committee.

MARK LAWLEY: So you started a different career and you had a parallel career that a lot of people don't know about in the Seabees.

MARLIN THOMAS: Yes.

MARK LAWLEY: Can you tell us something about how you became a commissioned officer, and then the work that you did for many years? I think you only retired a few years ago. And you rose to the rank of captain.

MARLIN THOMAS: Yes. Seabees is a very special organization. I couldn't get into the Seabees because they were closed. Actually, I was approached to come back. I hadn't been out of the Navy very long. You have to be an engineer and you have to want to do it.

And so I came back and I was commissioned by direct commission. And you know, it's a special arrangement, particularly for Seabees.

MARK LAWLEY: So many people may not know what the Seabees are.

MARLIN THOMAS: Yeah, it’s the Naval Construction Force. And a lot of people would know the “Fighting Seabees” was a John Wayne story. It's a small group of construction specialists that do special assignments all over the world. We work mostly with the Marine Corps, actually. They do good things. And they also have a good reputation.

MARK LAWLEY: And you served in the first Iraqi war?

MARLIN THOMAS: Yes.

MARK LAWLEY: Can you tell us something about how your operations research and industrial engineering background helped you in those kinds of assignments?

MARLIN THOMAS: You know, I actually got interested in research when I was enlisted, working an aircraft carrier and they got a new air search radar. And one of the things you have to do is you have to troubleshoot the system and go in and find out the accuracy is from getting the radar targets. And I noticed there was a lot of fading, which we all know the concept. And everybody that's in radar knew how to--

But I was just talking to one of the officers and I said, you know, I bet you could actually travel all the way to the full range, undetected, with a radar because of the fading zones. And one thing led to another. And this officer talked to the commander and said, we'll find out. So we ran a series of experiments where we went out 300 miles and ran these scenarios with patterns. And we had the altitude. And so two out of the five actually were successful in hitting all of the radar patterns and going all the way through undetected.

And that concept of search and rescue, and I went to the Naval Postgraduate School. So these were things that became of interest-- military OR. And so that really became the kick off.

MARK LAWLEY: Now, during this period, after your graduation and through your military and academic career, you remembered your Native American heritage. And I think traveled to some reservations. Can you tell us about one of those?

MARLIN THOMAS: Well actually, when I was a regimental commander, there was a terrible storm. The Seabees went out and basically rebuilt these small houses that the Indians lived in on the reservation. And this was over a period of a couple of years, I think, before they finally finished it.

And they ended up having volunteers from other construction organizations with the Army, Air Force. And so when this was over, these were the Lakotas. And they had a big ceremony. And I was fortunate enough to represent the Navy with that. And that wasn't the only time.

I'm also a member of the American Indian Science and Engineering Society. And I do, periodically, help them in making selections with their scholarships.

MARK LAWLEY: And so after you left Chrysler, there was a time where you were at the University of Missouri at Columbia, is that correct?

University of Missouri and Cleveland State

MARLIN THOMAS: Yeah, I moved around quite a bit. And some people used to say, well, can't keep a job. And I always like to think I could do a lot of jobs. But yeah, I was at the University of Missouri for three years. And in fact, my daughter still lives there at Columbia. But then I went into start a manufacturing center at Cleveland State University. And it ended up being a

very important opportunity for me because we became part of the manufacturing center. And we were one of three organizations that made up what's called CAMP, that's the Cleveland Area Manufacturing Center. I think it was about 10 years.

And then from there, I worked through NSF to get the award. And then I ended up going to the National Science Foundation. And then from there, I spent as a department chair. And I ended up spending three tours of department chair at Cleveland State, Lehigh University, and Purdue. And each one was unique. But like one of my old friends, Jim Barany said, you know, there are people that spent less time in a department chair than some people for capital punishment.

And I always thought about that, because there was a good analogy in being a department chair and serving time. And then from there, I ended up as a dean of engineering at the Air Force Institute of Technology. And I retired out of there. But I still have-- I've been very close to the University of Michigan as an alumnus and also as a faculty member. And I still hold a very small appointment with the school.

MARK LAWLEY: Can you tell us why starting that manufacturing center at Cleveland State was important to you?

MARLIN THOMAS: Well, actually Cleveland State is a city school. And most everyone is a first generation college student. And we really, really needed to help boost the economy up. The needs for areas like quality, manufacturing, manufacturability. We were not big enough. But when you combine it with Case Western Reserve, and one of the largest community colleges, then they formed a great opportunity. And then the industries got involved. Whereas before, they finally recognized to make more advances, everybody has to invest.

And so, through awards with the National Science Foundation, we became a good turn around. And it was one of those feel good opportunities. So it was a great career move for me.

MARK LAWLEY: Why is manufacturing important to you?

MARLIN THOMAS: Well, you know, as many other people say, farming is extremely important. And manufacturing is extremely important. That's where you actually create wealth.

And we have to get more and more effective in utilizing more ways that we can generate new wealth. Healthcare, obviously is very, very important. But you have to have some way of making the wealth. And that's why it's important.

MARK LAWLEY: So during this time, you continued your work in Markov Chains and also in warranty and reliability?

MARLIN THOMAS: Yes.

MARK LAWLEY: Can you tell us about, for example, of your work with Markov Chains?

MARLIN THOMAS: Well, actually, most of the Markov Chain modeling is approximations. It is the best way to represent the dynamic systems that accounts for changes. And Markov Chain is actually a structure, and it is the structure that is most understood and can be applied to simulate all kinds of dynamics. And I got interested, specifically, in how you can find ways of finding subsets of the system so that you can incorporate them.

National Science Foundation and Lehigh

MARK LAWLEY: So when you were at NSF, what things did you try to accomplish for the profession, and for operations researchers?

MARLIN THOMAS: Well, you know, I've been fortunate to work with some of the neatest people. I was assigned to Electrical Engineering and systems theory.

I mean systems theory, very, very theoretical. And meanwhile, down the hall, they were building the manufacturing directorate. And so I started working with them and ended up with a real tough political expectation. And I convinced people that operations research should be in manufacturing.

And that's also where the money was. And a greater need for applications than in theory. And so I, through the help of some-- George Nemhauser was on the committee for NSF. But it was actually John White who came in to be the head of the directorate. And he was the one that helped move. And that made all the difference in the world for—

And that was also at the right time for me. You don't have to be gutsy if you're getting ready to leave.

MARK LAWLEY: And after you left NSF, is that when you went to Lehigh?

MARLIN THOMAS: Yes, as a matter of fact, it is.

MARK LAWLEY: Can you tell us what prompted you to go to Lehigh?

MARLIN THOMAS: Well, you know, Lehigh is a private school. And Lehigh was also one of the leaders in manufacturing, long before others. And they actually solicited me. And since I had been with Cleveland State and I had the experience there of starting the center, it was a natural. And so I accepted the appointment, and then there, again, Lee Iacocca.

And because everybody knew that I had worked with Lee Iacocca. I mean, I didn't actually know him, of course. Although he did sort of knew who I was in the organization, because again, I was working on a special assignment for the warranty.

MARK LAWLEY: That was during your time at Chrysler.

MARLIN THOMAS: Right.

MARK LAWLEY: Yeah.

MARLIN THOMAS: So I got to actually know him because every six months, we had to have a meeting. And that was an exciting opportunity because I got to hear him tell the side of the story that I saw on my side. It was fun. He was a very, very interesting person. And I spent five years there and then I was invited to come to Purdue.

MARK LAWLEY: What were some of the things you accomplished at Lehigh?

MARLIN THOMAS: At Lehigh, they immediately started recruiting young people. But, manufacturing systems was what was needed. And the young people, that's what they wanted to do.

And George Wilson was one of the leaders that led the manufacturing. Then I worked with the young folks and the focus rather than being in manufacturing, it was switched to manufacturing logistics. And so they started working on a different, more analytical--

But we did attract some of the most outstanding young people. In fact, I was really amazed at just how easy it was between my working with NSF and sort of helping them find the roots around getting a large grant. And then they started the quality engineering program. This actually came after me.

It was a small organization but very elite. I did have an interruption because I got recalled to Desert Storm. And so that was a good transition for me to go ahead and accept the other because I was being courted by Purdue at that time.

Purdue

MARK LAWLEY: So the scale of Purdue I guess was much different from the scale of Lehigh. So it was just a much larger university.

MARLIN THOMAS: And we were, at that time, about 40 faculty - we were number two. Georgia Tech was the only one-- and I might also add that we were number five or number one in the nation for at least five years that I was there. That was a fun rivalry.

But yes, it was much, much larger. And organizationally, there were some differences in terms of the governance of the state. For example, at Lehigh, everything went through the dean whereas Purdue had Heads which was between a dean and a department chair.

MARK LAWLEY: So one of the most interesting characters that I remember from my time at Purdue was Jim Barany.

MARLIN THOMAS: Yes.

MARK LAWLEY: And I know you worked closely with Jim Barany. Can you tell us a little bit about your experiences with Jim?

MARLIN THOMAS: Oh my goodness, he was just-- well, he was a legend there. And he had his own way of doing things. And he's one of the most dedicated people that I know. He passed away at age 80. But he was, like I say, one of the most dedicated men I knew. And everybody loved him. But he was old and had his own ways of doing everything.

He would actually use paper and pen to analyze everything. His secretary would run his PC. But he was actually a character. And he had a way with students that was remarkable.

And I always had to overlook his language. I was constantly having to remind him. And people would actually accept that. He had a way of describing something. But everybody loved him.

And it was a shocker when he died. And he called me just before he died and told me he thought he was going to die. I ended up being in the middle of this whole thing standing in front of a priest, and trying to answer questions. But I didn't know how to talk about Jim and everybody knew it.

But yeah, he's still a legend at Purdue.

Air Force Institute of Technology

MARK LAWLEY: So after you finished at Purdue, then you interviewed at Air Force Institute of Technology for the dean's position and ended up spending several years there as dean.

MARLIN THOMAS: Yeah, -- that was a natural match for me to go back in the military, because I felt comfortable there. And I still did some of the military work that's classified. And it was a great place to go back to. I felt like I was coming home. And it was one of the best, neatest things I did. I love the military and I ended up bringing some of my old colleagues in, department heads there.

So I'm retired still. I still actually have an appointment there because that's the way -- you don't die, you just fade away.

MARK LAWLEY: And when you retired, they made you University Distinguished Professor. Is that right?

MARLIN THOMAS: Yeah, it's called the Air Force Institute of Technology Distinguished Professor.

MARK LAWLEY: I know that some of the things that happened there might be secret or classified, but I'm just wondering if you can tell us about some of the challenges that you faced as dean?

MARLIN THOMAS: Well of course, I worked with a lot of the research groups. I actually had led one grant dealing with a lot of the man-made explosives that were used to kill a lot of people.

MARK LAWLEY: The IEDs.

MARLIN THOMAS: Yes. And I had several people that were into that. Air Force Institute of Technology is a graduate school and major research center. It's big in scope in terms of what they do. We had all of the right people. And yes, it's highly classified. They did some pretty fantastic things. Our students in aeronautical engineering run experiments in outer space.

In the beginning, in operations research, we started that way. And then we became very more and more specialized. So now it's back, it's harder. Although, in critical areas, like the University of Michigan and health care. They actually work and integrate with medical professionals at the university. But it's taken a long time before that, if that really happened. So we're progressing.

But unfortunately, there's a lot of things you can't tell about.

Dedication to Service

MARK LAWLEY: So a great deal of your career has been dedicated to service.

MARLIN THOMAS: Yes.

MARK LAWLEY: And in these service positions, you work more for the success of other people than for your own success. What has motivated you to do that?

MARLIN THOMAS: Well, don't we all really strive in academics to make things better, certainly, in industrial engineering and operations research. And maybe some have more opportunity than others. I actually have found it more opportunistic for myself to try to improve things. And in that sense, I guess, my motivation is, that you're always trying to make it better. And sometimes it requires more emphasis than others.

So in that sense, a lot of people have commented that I spend all my time just fixing things. And I suppose that's the motivation. But I do like working with people. And I've been blessed with working with some of the greatest people in the world. And so I think it's just sort of-- I guess you might say-- my family is that way. And I don't know, maybe it goes back to the Cherokee.

MARK LAWLEY: So what are some of the other values that you have that have been very important to you that have helped you with all these great accomplishments that so many of us respect? And where did those come from?

MARLIN THOMAS: Well, of course it goes back to my family. My father was a tough guy. He was a construction guy. But we were always respected and worked in junction with trying to-- honesty is extremely important. And I think integrity. And I suppose that everybody feels that way. But I was always brought up in that way. And I like to think, that most of the people that I work with, they actually thrive on being able to help others.

If you're in academics, and you're working in research, if you are not interested in helping others and leading others, then you have to wonder why are you here? And so I suppose-- so I'm big on honesty and integrity.

MARK LAWLEY: Marlin, is there anything else you'd like our listeners to know about your career, your devotion to our profession, to operations research, to helping the people that have come after you?

MARLIN THOMAS: Well, it seems like there's a trend to reduce the basics in the curricula. And it's hard, because the pressures are always to take something out. And I think that we started out with a bunch of people in the mechanical engineering business. And then people started working together in an interdisciplinary fashion. And it worked very well. It has for years. And I think that now people are forced-- you still have to have enough science background to be able to interact and move into other areas, rather than becoming limited.

So I think the pressure's on how to best organize ourselves and continue, you know, like when I hear someone no longer has organic chemistry, I think, what if that's important? And it is important. So I think the focus for operations research in particular, is to continue and not-- I mean, to actually have the opportunity to integrate as people, work together, and learn from each other. I think that's very important and is very hard, hard to keep. And I don't know, I guess being a dean and serving in all these different committees, you constantly see this.

But on the other hand, the exciting things that are going on now and the things that are going on in health care, that's motivating and it's very encouraging. Our young O.R. people continue to be among the brightest.

It's just unbelievable on how we have grown. But it still comes down to the bottom of the success is how well you work with others, jointly, to solve important problems that helps our country. And I think we're doing that. And I hope that we continue. But not become so narrow that you have to have 12 people to solve and think unconventionally at solving important problems.

MARK LAWLEY: Well, one last question. What do you think your Cherokee grandmother would think about what you've done with your life and what you accomplished?

MARLIN THOMAS: Well, all my grandmothers would think I'm great. But as far as I would like to think that they'd be proud of what I've tried to do in helping others to make it a better world. That sounds corny, but I really believe this. I had a mother that never saw anything I did wrong; my dad, now, he was a little tougher. I feel good about the respect that I've been given to people.

MARK LAWLEY: Marlin, thank you very much.

MARLIN THOMAS: Thank you.

MARK LAWLEY: Very good to talk with you.

MARLIN THOMAS: Thank you.