



AMERICAN INSTITUTE OF MINING,
METALLURGICAL, AND PETROLEUM ENGINEERS

ORAL HISTORY PROGRAM

**Harry Paxton:
Steelmaking Research at Carnegie Mellon – 50 Some Years of Fun**

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00:14 Introduction

Lawrie-Munro:

Hi, this is Michele Lawrie-Munro, Executive Director of AIME, the American Institute of Mining, Metallurgical, and Petroleum Engineers, and today is Wednesday, March 14th, 2018. We're at TMS's Annual Conference, the Minerals, Metals, and Materials Society in Phoenix at the Sheraton Grand. We are recording an oral history of our guest here, Dr. Harry Paxton. So we're welcoming you, Dr. Paxton.

00:48 1982 President of AIME

Lawrie-Munro:

In researching your background, I had a revelation that you are actually the oldest living president, from 1982, from AIME. Did you realize that you had that distinction?

Paxton:

I did not. I was a little bit shocked.

Lawrie-Munro:

Absolutely. So it's a real pleasure to be able to interview you because you've got that strong connection to AIME as well as TMS.

Paxton:

Yeah.

01:11 The Early Years – Yorkshire England

Lawrie-Munro:

I noticed that you went to school in England.

Paxton:

Yes.

Lawrie-Munro:

So, were you also born there as well?

Paxton:

Yes. I was born in the north of England on a farm in a small village in Yorkshire and my father always

wanted me to be a farmer and I had no interest in being a farmer.

Lawrie-Munro:

Okay.

Paxton:

I did enough farm work that I realized I didn't like farm work.

01:40 The Road to Becoming an Engineer

Lawrie-Munro:

Excellent. So then who influenced you to become an engineer?

Paxton:

I suppose it's a long story, but I went from a little village school with really two rooms, and when I was eleven I got to go the local, what's called in England, grammar school which, it's a mixture of junior high and high school. I worked my way up through till I was in what's called the sixth form, which is the university entrance. At that time, probably one percent of students went to universities and not as it is today. So, you actually did university prep for the last two years of high school. I went into the sixth form when I was 14 which was two years before I should have gone.

There were three of us in the sixth form. So, the headmaster was a chemist and a very good chemist. Taught us chemistry forever. We sat one on each side of him and we read his notes, we copied his notes. I decided I wanted to try metallurgy because I was going to make aluminum from clay instead of bauxite. So he said, "Why don't you go to Manchester?" Which is where he'd been a student in 1908.

He was a student of Ernest Rutherford. He got the Rutherford Prize the year Rutherford got the Nobel Prize. So, that gives you an idea of what was a high school teacher in those days. So I went to Manchester and had a great deal of good fun and a terrible education.

So, I didn't know this. They dusted off old notes that they'd been giving for 50 years. So, I stayed on for a master's degree and I was going to do a Ph.D. in metallurgy. At that time, this was just after the war, it was 1949, the Marshall Aid was being started in Europe and one of the things that they were doing was giving scholarships to promising students, if I can say it that way, to go and spend a year in the United States. My professor said, "Why don't you apply?" So I applied and went to a committee and all this and got the scholarship.

They said, "Okay. You won the scholarship. You're going to Purdue." I had no idea what Purdue was because I had asked to go to either MIT, as it was in those days, or the University of Chicago, which were the three leading metallurgy schools at the time. So they sent me to Purdue.

When I got to the US, the guy in charge of the program said, "Would you like to go to Carnegie Mellon? They say they'd take two of you." They already had one. So the two of us went. I said, "Yeah. Forget

Purdue." I went to Carnegie Tech just on a roll of the dice.

Lawrie-Munro:

Wow.

05:12 Relationship with Carnegie Mellon - 50 Some Years of Fun

Paxton:

That's how I became associated with Carnegie Tech for 50 some years.

Lawrie-Munro:

Well exactly. What that started, that's amazing.

Paxton:

We went up on the overnight train to Pittsburgh. It was still pretty black. It was the typical example. It was cleaning up, but it was not clean and we stayed in ... Bill Dennis was the other guy and I. He was also a metallurgist. We went to Carnegie Tech for a year and had a wonderful time. I got more and more interested. My education got straightened out I would have to say.

Lawrie-Munro:

Excellent.

Paxton:

I did well enough they wanted me to stay and teach. I said, "No. I have to go back." I had to go back for three years as a part of the deal on this scholarship. After two years, they called and said, "We need you to come back and teach. We're losing a faculty member." I can't do it. So shortly into the third year, I got another call, "We need you to come and teach." So, Ann and I were in the process of getting married shortly before I was to leave. So, I said, "Okay." I was able to tell Ann's father that I had a job. Probably was making more than he was at the time. I came and started to teach the steel makers of Pittsburgh a graduate course in alloy steels.

Lawrie-Munro:

Wonderful.

Paxton:

I was a full chapter ahead of the class.

Eventually I became fairly competent in this area and never regretted a moment of it. It's just been 50 some years of fun.

Lawrie-Munro:

Wonderful. That's ideally what everybody wants, so that's wonderful that you found your passion.

Paxton:

I used to say, I did what I wanted to do and somebody was willing to pay me for it.

Lawrie-Munro:

Yes.

Paxton:

Where can you have a better job than that?

Lawrie-Munro:

Exactly.

07:19 Meeting Ann in Birmingham

Lawrie-Munro:

So, you mentioned your wife, Ann.

Paxton:

Yes.

Lawrie-Munro:

How did you all meet? And I know you have at least a daughter that's a lawyer, so tell me about your family.

Paxton:

We met in Birmingham. She was doing physiotherapy at one of the local hospitals and I had maybe finished my Ph.D., or at least I'd put my thesis in, it hadn't been passed. And so we started going out. We met at what was called a hop. The nurses would invite the local students in for a dance on Saturday nights to get dates I guess. I fell into this trap and we were married in May of 1953. So this May we will be married 65 years.

Lawrie-Munro:

Wonderful.

Paxton:

She's here, so you'll meet her.

Lawrie-Munro:

Wonderful.

08:17 Assistant Professor of Metallurgical Engineering - 1953 - Learning a Lot About Alloy Steels and Other Things

Paxton:

We came over and found a little apartment that was \$75 a month, including all utilities. This is 1953 when beer was ten cents or a quarter for a drink. Our alloy steels class would go from 7:30 on a Friday night to 9:30 and we had like 50 students in there, including about five future members of the National Academy of Engineering. It was a two-semester class. We kind of cleaned the stables a bit after the first semester. At 9:30, we would adjourn to the local bar and conduct the class till about 3:00, till they threw us out. So we all learned a lot about alloy steels and other things.

Lawrie-Munro:

Excellent.

09:15 The Grind up the Academic Ladder

Paxton:

And, so that was my start. You know, you grind up the academic ladder. I ended up going through the hoops and getting tenure and becoming a professor. I had a couple of visiting professorships, one at the Imperial College in London and one at MIT. When I was at MIT, Diran Apelian was my teaching assistant.

Lawrie-Munro:

Excellent.

Paxton:

We've been pals since. I didn't turn him off as far as I know.

09:50 Our Family

Lawrie-Munro:

Absolutely. So just a bit about your daughter, the rest of your family?

Paxton:

We have two daughters, Jane, who lives in South Carolina. She's married to a businessman. He used to work at Kodak and then Xerox and a couple of other things. He's been very successful. Right now he's sort of an independent entrepreneur. They're busy growing ... They're doing hydroponics near Rochester, New York. Since he was at Kodak he does very well.

And I just heard from my daughter Jane this morning. They've been on a two-week trip to Papua, New Guinea. She got back this morning and called and said, "Alex got his bank loan so he's all set to go." So that's Jane. She's basically retired but plays golf and goes on trips and stuff.

Lawrie-Munro:

Lovely.

Paxton:

Sally, our second daughter, is a lawyer. She was a partner at Fulbright and Jaworski in Washington and then, the White House called and asked her to go and work in the White House when Bill Clinton was president. She stayed quite a time there, and then she went to be the chief lawyer at the Department of Labor in Washington. Then when Bill Clinton left office and Al Gore lost, she was appointed Executive Director of the International Labor Organization in Geneva. So, she spent five years there. Then she came back and worked for Bill Gates and she couldn't stand some of the middle management at the Gates Foundation so she left. And she decided that she would start as a consultant. She's ... apart from being too busy, a consulting lawyer raising money for other people.

Lawrie-Munro:

Wonderful.

Paxton:

Then we have two sons. My son Anthony who has got a degree in economics from Bucknell and is an all-American water polo player, member of the Water Polo Hall of Fame, Bucknell University Hall of Fame, and he sells machinery. He goes all around New England in the snow. He's a great kid.

Then my other son went to Brown and got a degree in neuroscience. Then he went to Penn State. He's a jock, he's still playing soccer. He's 50 some. He's still playing the semi-pro league in San Diego. He has had several jobs. He's always working for idiots after he's been there a year, so he leaves. But he's right now working for an outfit that makes an MRI that measures brain size, and if you've got problems, your brain size changes, and they have a device that measures all of this. So, he has uses for his degree in neuroscience from Brown.

One of his professors was Leon Cooper who is the C in the BCS theory of superconductivity, which got the Nobel Prize in 1970... whenever it was. So Leon Cooper's a good guy. He's no longer living but his friend, Bob Schrieffer, who I knew very well is; he's the third one. And then John Bardeen, who when I was at NSF, I used to support. John Bardeen has two Nobel Prizes. Interesting. The guy would never say boo to a goose, but he's got two Nobel Prizes.

Lawrie-Munro:

Excellent. Wow. Very accomplished family.

Paxton:

So that's ... And so, I was basically at Carnegie, and then ... all this stuff is written in the history I was telling you about.

14:11 The Mansfield Rule – A Fellow at Mellon

Paxton:

But just quickly, in 1968, somebody was up in front of Mike Mansfield on an investigatory committee in the Congress when Mike Mansfield ran the Senate. Somebody gave him a smart aleck answer about money that the Defense Department was spending on research. He ticked off Mike pretty well. Mike said, "What's the Defense Department doing supporting work on gadolinium or whatever." And so he said, "Any money the DOD gives in future has to have some clear interest for the Defense Department." And so that was known as the Mansfield rule and it upset the apple cart because the DOD was supporting a lot of the basic research in this country. This was 1968.

We had these materials research labs, 12 of them around the country, which had been founded by ARPA in the early 60s. And a couple of them were pretty good, and a couple of them were old boys' clubs and so they had a review. David Packard was asked to form a committee, go around and investigate them all and write a report. And he did and he was harsh on some of them, properly so. And so, they said, "We're not going to support just any research out of the DOD. This was a time when materials wasn't really a household word - the materials laboratories were the only way materials was talked about. It was basically run by physicists. And so, the National Science Foundation was given money from the DOD and lots of other places, including these materials research labs.

Ed Creutz, who was the associate director of the foundation, had been head of our physics department. And, I'd been a consultant of his out in San Diego, which is how I know so much about La Jolla, and so Ed called me. He said "Harry, we need a guy to run this new materials department." I was about to become associate dean of the college, so I talked to our Dean and said, "You know, they've asked me to go down to Washington for two years and get this thing started." He says "You ought to go." So he made it possible for me to go, we got a new department head. (I was the department head.) I inherited about \$40 million to go and sort this lot all out. And of course, I was everybody's friend at that point.

Lawrie-Munro:

Absolutely.

17:05 The First Director of the Division of Materials Research, National Science Foundation 1971-1973

Paxton:

But, we had about one dollar for every three dollars we needed. You've heard of financial straits. So, I

made one friend for every two enemies I made over the years. But, we got the labs sorted out, we made changes in it ... used the same people but had them do things in a different way. You got a lot more working together rather than somebody going off in a corner. Unlike our late friend Stephen Hawking, who could sit on a stool and think about the universe. Well, we had actual labs and so on. We probably had half of the program in the materials research labs.

Until then it had been a closed shop. It was 12 friends of the management, and so we opened it up and the number went up and a few of them disappeared. And they're still going today and they're still doing pretty much the same way that we set them up to do in 1972.

Lawrie-Munro:

Wow.

Paxton:

I'm pretty proud of that, I went to the 25th-anniversary thing in 19 whenever it would have been... '97 or something like that.

Lawrie-Munro:

Yes, correct.

Paxton:

They were doing the same things.

Lawrie-Munro:

Wonderful.

Paxton:

I must be a great manager or something.

Lawrie-Munro:

Exactly, a great visionary.

Paxton:

And so, when I came back, there was really no place for me at Carnegie, well it's now Carnegie Mellon by this time.

Lawrie-Munro:

Right.

18:35 A Fellow at Mellon – US Steel Vice President of Research and Running the Mellon Institute

Paxton:

I had been a fellow at Mellon Institute and when we joined up in 1965, I got fired because you couldn't have two paying jobs in the same university. So, I ended up being the department head. When I came back from NSF, we had a new president. Our old president had gone to be director of the National Science Foundation. And so, they wanted me to come back and be director of research for the university, which I did for a while and I was also running the Mellon Institute that Ted Massalski has talked about so much. So, I had this job, but it really wasn't a job. I didn't have a budget to speak of, I couldn't encourage anybody. I could talk, I could go to Washington and try and influence people to do things where we got the inside track which is called politicking. But, that isn't me, that wasn't fun. So, shortly after I had been there, US Steel was losing their Vice President for Research, Dennis Carney.

Lawrie-Munro:

I've got down vice president corporate research and technology.

Paxton:

Well, that was later, but I was vice president of research which was actually a pretty eminent job in the world of metallurgy at the time.

Lawrie-Munro:

Absolutely, yeah.

Paxton:

US Steel had never hired anybody from outside. And so they wrote a letter to all the universities saying, "Who would you recommend to become vice president of research?" The President at Cornell didn't know me from Adam, wrote a long letter at the insistence of the guy who runs his materials research lab, Gene Hughes. And so, I got the job.

20:24 Working in the Government and Academia

Lawrie-Munro:

One of the things in researching your background that I found most interesting was that you've worked in not only academia but also in the government, and also in industry. So talk a little bit about the differences between those and which you might have preferred.

Paxton:

Well, they all had their points ... good points for what they were trying to do. When I was working for the government, which is the shortest time, that was just a two-year stint. I was able to really get the field of materials off to a good start and we built confidence that was going to stay. We brought in a lot

of chemists, a lot of physicists, geologists, materials didn't really exist. There were very few departments that even called themselves materials. And so, the plus about that was being able to really get a new field with a good base to build on. It has built, and I haven't been close to it since, I mean I went back, more into steel, kept an eye on materials but...

Now, the academia, it was wonderful, because you had students, you had grad students. All kinds of things going on. You had to hustle a little bit to raise money to support everybody, but if you got on well with fund givers, we always had enough money to do things. A university, when you don't have money to do things is not a really good place. You have to be able to be a tub on your own bottom so to speak. You don't cost the department much, you pay a chunk of your own salary. You support a number of graduate students so they don't have to pay. And, if you can get in that position, you get senior enough in that position, university is a good life. And in my latter days at university, I kind of got out of the department and I ended up being consultant for the provost I guess. I did all the work that he didn't want to do.

I had a great time in that because I got to meet everybody in the university and we had this gang of University Professors, who were supposed to be cream of the crop. I was a chair of that group and I had to run all this lot. So I've been a manager for the last 40 years more than a scientist. I've written a couple things, but as you'll see from my list, my serious science ended in 1971.

Lawrie-Munro:

Yeah, speaking of books, I saw that you did a memorial tribute to James Bliss Austin... sometime back.

Paxton:

Yeah, he was the guy who's job I took eventually.

Lawrie-Munro:

Yes.

Paxton:

Ed Bain had it, and then Jim Austin, and then Dennis Carney, who was really an operating guy. A very smart guy, but a little bit independent, he told Chairman Ed Speer where to go - and he went instead. Jim Austin became a good friend; he was a chemist actually, but he ran the Bain Laboratory for a long time. Bain started it Jim Austin really ran it after Ed. When Ed retired, within a week he had a stroke. He was a guy was working till the last day, a week later, bang, he had a stroke.

And so, I wrote this book with him. When we first started, we'd do an hour and that was all, and he was wiped out. Then we got ... so we could spend a lot of time together, and finally, the last two chapters, I was working on stuff that Ed didn't know anything about, so I just wrote those. In academia, you were very much your own boss. You could do what you want as long as you didn't cost the university a lot of money and you didn't get bad reports from the students.

Lawrie-Munro:

Right.

Paxton:

And I guess I did okay.

Lawrie-Munro:

Oh yeah, staying there for over 50 years, yeah.

25:22 Working in Industry – A Different Kettle of Fish

Paxton:

Now, working for industry was a different kettle of fish. I showed up for work I think on December 1, 1975, I believe, and I had 1400 people that were going to report to me of whom I knew about 10. So, firstly, I had to get to know people. Well, I got to know the top 50 say or something like that. And, find out what they were doing, and was this a good thing for ... because I had to go to the board of directors twice a year and tell them what we were doing and ask for money.

And, at that time the budget was quite a few tens of million dollars a year. And, so, you know, 1400 people, it's ... the salaries weren't huge in those days but you know, half of them were Ph.D.'s, so we were paying whatever we had to pay. But then the thing was, you had to deal with all the old operators who ran steel mills and limestone and coal mines and forests and all kinds of things so and I had to go and talk to them about research and how it would help them. Sometimes, the chairman would come down and say, "The research budget is going to be so-and-so." Just like advertising, legal, his airplanes and so on. And everybody had to pony up and pay in.

Over the years I had to go out with my hand out and you never knew which year it was going to be. And that was a real sales mission, to get enough money to run, because we really couldn't ... we could fire people, but you couldn't fire people because you didn't have enough money. You might fire them or let them go if you didn't have another job for them. If the subject you were working on was going out of date. But, we covered the waterfront, including, a chemicals division. We took the products of the coke ovens which are benzene and toluene, black junk. It's called coal tar, and we made a chemicals business out of it. It was pretty profitable and eventually we sold it to Mitsubishi.

And I had to know enough about all the subjects to fool the guy that was running it and then say, "Jim, you really aren't doing enough in this area, we need pony up to do ..." {grumbles} And so, it was often funny ... I learned as much in those 10 years because it was new stuff and stuff I had to know. At the university, I was working on stuff I wanted to know, which is a very different kind of thing.

Lawrie-Munro:

Right.

28:37 Yukawa Lecturer and Honorary Member of the Iron and Steel Institute of Japan - 1985

Paxton:

But I really did learn an enormous amount and I was very active in activities outside the company. All the steel companies in the country were part of AISI, who I am sure you know about. We had a General Research Committee, of which I was chairman for a long time ... we had some things we could do together. Then we were busy getting our USS group together with the research labs in Japan and Britain. I was supervising all that. I was very much interested in trying to get people to work together on anything we could that wasn't proprietary, "Let's share the load, we could do more for the same money." And we did.

I spent a lot of time in Japan and made many good friends. I gave the Yukawa Lecture and thus became an Honorary Member of the Iron and Steel Institute of Japan.

Lawrie-Munro:

Right.

Paxton:

70 is a magic number in Japan, so they had me for their 70th, which I am very proud of.

Lawrie-Munro:

That's right.

Paxton:

And I'm still on their mailing list and they still send me the journal of the Iron and Steel Institute every month. And I look at it, I don't understand it frankly. Most of it.

30:00 Impacts on the Industry – The World Started Making Too Much Steel

Lawrie-Munro:

Wonderful, I noticed that you've lectured all over the world, France, and the UK, Holland, Argentina, Brazil, Mexico, Poland, China, the former USSR. So, being that you've got such a breadth of experiences across the globe, what kind of things have been most impactful do you think on the industry across the globe from what you've witnessed over the years?

Paxton:

Oh boy, you know it's the things that happen; are largely out of the control of the technical people. There are economic issues, there are environmental issues, I mean, we can ... sure we can work on parts per billion of things and how to do it. But, in far too many cases, steel is a political football, and although the chairmen of the companies would have some influence, it's really controlled on the federal level and you adapt to it. Right now, I don't like this tariff thing that Trump wants to put on, which is idiotic. We've been through it so many times, it hurts us more than it helps us. But you have these externalities, the

U.S. steel industry was looking like it was going to be a leader, and then the world started to make too much steel.

And, my favorite story, that I used to lecture on a lot was that in 1946, Japan had half a million tons a year of steelmaking capacity. Now they have about one hundred and thirty. China, at that time, probably didn't have half a million tons in 1979, the first time I went to China. They invited a group of us who had been presidents, of TMS, Paul Shewmon, Bob Jaffee, Alan Russell, John Elliott. We were invited by metallurgists hoping to found a professional society. The Gang of Four had just gone kaput, so, I had a Red Guard as my interpreter and guide; he spoke very good English. But, he was a little kid about 20, 18, something like that.

China was making 40 million tons a year of steel. Later on, in the 80s, I was invited back by the minister of steel, maybe it was the time when Japan was giving me the honorary medal, and so I was able to extend the trip into China. He said, "We're going to make 3 million more tons of steel every year, from now till we're making what the rest the world is making." Which is 800 million tons.

And that's what we've done. So we now make 1600 million tons of steel, which is about 400 million more than we can ever use. And that's why we have all this glut of steel, some of which is real steel and some of which will sink in water, and that's about ... {laughs}. So, this is something the technical people have no control over. It's a political drive, and so I can't give you a very good answer to your question.

If I was the Super-Czar of steel, I could reorganize the world's steel, but nobody's going to make me that. I probably could do it, I think, but at this stage of my life, I'd rather play golf.

Lawrie-Munro:

Maybe we should.

Paxton:

Maybe I should, but who's going to ask? So, that's my story on that.

Lawrie-Munro:

Oh, and that's a very good story.

34:11 The Environment - One Part Per Billion Martini

Paxton:

One other story ... you have got to hear this, it is such a good story.

Lawrie-Munro:

Absolutely.

Paxton:

We were responsible for environmental, because we had coke ovens and things which were absolutely awful pollutants. And I had to give a talk to the board of directors one time every six months, and I chose the subject and I talked about it, and I said, "Well, it was time we talked about the environment." Because this was a time when they were really coming down on coke ovens. And, you have to have them if you going to make blast furnace iron and so on. So, I had the problem of explaining to the board of directors who were largely chairmen of the big companies and mostly financial guys, limited technical knowledge.

"What's a part per billion?" Because that's what the EPA was talking about. How many parts per billion of benzene can you have from a coke oven? So, I said "Well, a part per billion, if you have a conventional swimming pool, size of this room, say, and you fill it full of gin and you put one drop of vermouth in, that's a one part per billion martini." "Oh, we understand."

Lawrie-Munro:

Excellent, yeah, excellent metaphor. [Laughs.]

Paxton:

So, that's my other story, if you can get that one in that would be appreciated.

Lawrie-Munro:

Oh, that's wonderful.

35:45 Serial Association Member

Lawrie-Munro:

Okay, so just a couple of last questions just to wrap up. I saw that you were also a serial association member.

Paxton:

Pretty much.

Lawrie-Munro:

You're the fellow of the American Association of the Advancement of Science, ASM International, AIME's member society, TMS. I found out AIST as well. So, you're also past chairman of the general research committee of AISI.

Paxton:

Yeah, that's right.

Lawrie-Munro:

And past president of TMS of course, and AIME.

Paxton:

Right, right.

Lawrie-Munro:

So, how did you first get involved with societies? And what's driven you? What's been the benefit to you of the society?

Paxton:

Well, I used to come to meetings.

Lawrie-Munro:

Mm-hmm (affirmative)

36:23 A Natural Chairman

Paxton:

When I took my first assistant professor job, I was 26 years old, freshly married. I had come to meetings, and I met a lot of people, and they were both good and bad. We made a lot of good friends, we found out people we could call, "What's the answer to this question?" And I got put on committees, and I ended up being chairman because I don't like being anything else than chairman because then you control the agenda. And I just kept moving up I guess. I mean, was chairman of the school board.

I ran for school board when I was in Washington with the National Science Foundation. My wife was my agent, she went around giving speeches after having a slug of something before she could give a speech. {laughs}. I was elected and within three months I was chairman. I got to Green Valley, we have an arts center, community performing arts center, which was built with county money, in 2008. They were having a fundraiser, Freeport-McMoran gave them a \$250,000 challenge grant. And we had to raise it, so we did, we got about \$270K, which was great.

I was talking to the guy who was raising the money and who was chairman at the time, and I said, "This is silly, you're doing these things all wrong. You're going for \$10. You should be going for ten thousands." And so, he said, "Well, how would you like to be on the board?" So, I said, "I don't have any problem with being on the board." So, I went, and I was elected to the board. Two months later I was chairman, I had to run this new venture which was a big old barn of a place with no customers and no programs. That was 2008, I went last night to a talk. Someone we use regularly, had a full house. We've had nothing but full houses. We got a new set of seats in, we are in the black. So, I guess I may be a natural chairman.

Lawrie-Munro:

Wonderful, I was going to say it sounds like networking and leadership skills were kind of two big benefits out of there.

Paxton:

Well, you've got to produce. If you don't produce you ...

Lawrie-Munro:

Absolutely.

Paxton:

And so, I don't like to lose. I'm the worst sportsman you ever saw. I'll kill them so I don't lose.

38:59 Serving as President at an Interesting Time in AIME's History

Lawrie-Munro:

One thing we didn't talk about with AIME and I want to do really quickly is, you served at an interesting time back in AIME's history, and this was-

Paxton:

Sorry what?

Lawrie-Munro:

You served at an interesting time as president in AIME's history.

Paxton:

Right.

Lawrie-Munro:

When the groups were-

Paxton:

Inverted.

Lawrie-Munro:

Putting a plan in place to actually separate from the parent society.

Paxton:

Right.

Lawrie-Munro:

AIME has kept that structure since the middle 80's.

Paxton:

Mm-hmm (affirmative)

Lawrie-Munro:

And I think you said that was one of your greatest accomplishments was getting those kinds of plans in place and approved by the board.

Paxton:

As a managerial exercise, yes. As a thing I believed in, no.

Lawrie-Munro:

Exercise in diplomacy.

Paxton:

But there was nothing you could do about it, when you didn't have the votes.

Lawrie-Munro:

Yeah.

Paxton:

So, when you don't have the votes, you do what you have to do.

Lawrie-Munro:

Absolutely, but it's stayed in this structure till today, so that's ... You've put those plans in place.

Paxton:

Maybe I was overcautious.

Lawrie-Munro:

Yeah.

Paxton:

And other solutions might have worked, this one seems to have worked okay. So, more power to you.

Lawrie-Munro:

Absolutely, so we're grateful for that, I'm grateful for that. I've had a 15-year career with the organization, so it's been good. One last thing I also ... and we did elect you an honorary member in 1992.

Paxton:

Right.

Lawrie-Munro:

So, congratulations for that.

Paxton:

In San Diego.

Lawrie-Munro:

And you also got inducted to the National Academy of Engineering back in 70's.

Paxton:

I'm almost a 40-year member.

Lawrie-Munro:

'78, that's right. So, it would be 40 years. Oh, there you are, you've got your tie.

Paxton:

I've got my tie.

Lawrie-Munro:

Excellent

40:29 Advice for Young Engineers – The Sky's the Limit

Lawrie-Munro:

So, being in all those leadership roles and everything and seen so much change in the field and

everything. I'd love to understand what kind of advice you might have for young engineers as we wrap up. Who might be just starting out in metallurgy or in steel?

Paxton:

If you're a good ... I don't say student, but if you're going to be a good engineer, and you had a good training and background and you've got good personal skills, the sky's the limit, you're going to go. There's a shortage of people who can do things and understand the technical parts well enough. So, I would say stick to it and don't be disillusioned too early. It may take five years, it may take 10 years, but remember people are dropping off the other end and so these jobs are going to open up.

Lawrie-Munro:

Very good point, it's a great opportunity, great time to be a young engineer. Is there anything else you'd like to share before we close out here that we haven't already talked about. I know we have a lot of other background material and photos for you.

Paxton:

I've probably forgotten, but. Yeah, I don't have any more statements to make.

Lawrie-Munro:

Okay, excellent. Well, what a fascinating career and life you've had.

Paxton:

It's been fun.

Lawrie-Munro:

And thank you so much for the time you have given us so that we can share it.

Paxton:

I enjoyed it, I wouldn't have done it if I didn't enjoy it.

Lawrie-Munro:

Absolutely.

Paxton:

Nobody had a gun at my head. And I like to see things done well. My wife says, "Oh, you do? You don't do them well at home."

Lawrie-Munro:

I can't wait to meet her.

Paxton:

She'll give you an ear full.

Lawrie-Munro:

Thank you for your service too to TMS and AIME.

Paxton:

Oh well, that was fun.

Lawrie-Munro:

It was a pleasure to meet you.

Paxton:

Thank you.

Lawrie-Munro:

Take care.

42:53:18 End