

DAVID PACKARD

ORAL HISTORY

COMPUTERWORLD HONORS PROGRAM
INTERNATIONAL ARCHIVES

Transcript of a Video History Interview with
David Packard, Co-Founder, Hewlett-Packard
Recipient of the 1995 Price Waterhouse Leadership Award for
Lifetime Achievement

Interviewer: Daniel S. Morrow (DSM)
Executive Director, Computerworld Honors Program

Date: April 19, 1995

DSM: These interviews are meant to capture, for the National Museum of American History, an idea of what kind of people got into this business and made this revolution. So if you could give me a little background. You grew up in Pueblo, Colorado.

DP: Yes. I was born in Pueblo, Colorado in 1912. My mother and father had both gone to Colorado College, and my father moved to Pueblo, which was his hometown, as he was a lawyer there.

I spent my years growing up in Pueblo, Colorado. In those days it was not exactly a farm community. There was a steel mill there and there were a number of refiners there. They brought in ore from Leadville and coal from Rosenberg and iron and other materials from Wyoming. So it was kind of a rough and tumble town, sometime there were problems on the Main Street, but we lived on the north side of Pueblo so we didn't get involved in any of that.

DSM: Now your father was a lawyer and your mother was college educated as well.

DP: My mother was a teacher. She taught in a high school for a while but she had to stay home and take care of her own children after a few years.

DSM: One of the things that we would like to find out about leaders of this revolution is what kinds of things they were passionate about as young people. What were some of your early interests? I understand you were interested in explosives and radio and a bunch of other stuff.

DP: I remember from my very early days that I loved to see the mechanical things associated with things like locomotives and various kinds of engines, ships and so forth. I can remember that from the very beginning and it was probably the one thing that convinced me to be an engineer, which I decided very early and I haven't changed my mind since.

DSM: Can you talk about your early interest in radio?

DP: I had an interest very early. I remember when I was 10 years old I hooked up my first vacuum tube right on the dining room table. We had A batteries and B batteries and we dialed into WHO in Iowa. Actually before I left grade school I was able to operate a fairly sophisticated radio and I carried that amateur radio activity all through high school. Then of course it was very important later on as I will mention to you.

DSM: How did you get from Pueblo, Colorado to Stanford?

DP: It was a very interesting situation. I drove my mother and my sister to California in 1929, the first year of the Great Depression. We visited in southern California for several weeks with some relatives we had there and then we came up to Palo Alto to visit with one of my mother's classmates from Colorado College. She had a daughter named Alice and she had just completed her first year at Stanford, and she wanted to take me around and show me Stanford. Before that I never thought much about Stanford. I always thought I would go to Colorado University. In any case it was that visit that generated my interest in Stanford. I applied and to my surprise, I was admitted.

DSM: So this was in 1929 you came, and in 1930 you went to Stanford.

DP: Yes. I graduated from high school and came to Stanford in the fall of 1930.

DSM: There was a professor at Stanford named Fred Terman who had a pretty significant part in your life, can you tell me about him?

DP: He was very important, but let me say first that both Bill Hewlett and I were going to Stanford in the fall of 1930, and we met there. We had a few classes together, and I an amateur radio station over at Stanford, and I used to spend a little time over there. It was right below the laboratory in Professor Fred Terman's building. He would stop by and visit with me from time to time. I didn't know who he was. I knew his father was the developer of the Stanford-Binet intelligence test. It was in the spring of my junior year that he invited me into his office and told me I could take this graduate course in Radio Engineering if I wanted to.

DSM: Now, you were still an undergraduate?

DP: I was an undergraduate and that was really a great thrill for me because I was the first undergraduate to ever take his course. So I enrolled in his course and in the fall of 1934. That same year a man named Barney Oliver transferred up from Cal Tech. He asked Fred Terman if he could take his course. And Professor Terman told him that he could take his course but if he flunked the mid term exam he would have to drop out. Well who do you think got the highest mark on the mid term exam but Barney Oliver, and every test all year he got the best grade of the whole class.

DSM: So Mr. Oliver had to qualify? This was the same Barney Oliver that was head of R&D?

DP: Yes. Yes. Yes

DSM: That's a great story.

DP: It's a very interesting thing because Bill and I knew each other and Professor Terman took us up to visit some of the early electronics companies that were established in the area. There was a car engineering company in Palo Alto, and Philo Farnsworth had a television tube company in San Francisco. Fred said, "You see these folks and they haven't had much education. I think people like you and Bill, who have had an education, could do much better." Well of course that was a great compliment, but we still didn't know at that time if we could get a job. So Bill Hewlett and I, and Barney Oliver and a friend of Bill's from Florida, named Ed Porter, decided we would all get together and start our own business if we could not get a job. And that was really where the whole program began.

DSM: This was while you were still undergraduates.

DP: This was when we graduated from Stanford in 1934.

DSM: Now, I'm going to ask you a few more personal questions, then I will ask some of the official Smithsonian questions. 1934 was an important year for you personally. It was the year you met the lady that would become Mrs. Packard at a dance.

DP: Yes, I met her at her sorority house. Some of my friends wanted to go out dancing at a local hotel. That was the usual thing you did on a Saturday evening. I didn't have a lady to ask, and a friend said he knew someone that would go with me. I was in the kitchen in the sorority house with my sleeves up, washing pots and pans, and this young lady walked in and looked up and me and said, "When do you want me?" (laughter) That was the beginning of it.

DSM: You've been married for nearly 50 years?

DP: Yes.

DSM: And you have a son?

DP: Yes I have a son and three daughters.

DSM: So in 1935, there was a break between the time you got out of school and you founded Hewlett-Packard. You worked at GE for a while.

DP: Yes. We were interviewed by a man from General Electric. They had a practice of hiring young people from all across the country to come back and they continued this during the Depression. I received an offer for a job. That job didn't start until February 1935. In the interim, I went back to Pueblo and took some courses at Colorado University. I drove my mother and my sister to Pittsburgh. They wanted to visit some from there. Then I drove up to Schenectady, and the first man I met was Mr. Boureg who had interviewed me at Stanford. He knew that I was interested in, it was radio in those days and not electronics. He said, "There's no future in electronics in General Electrics. You ought to study motors and electric motions motors and so forth." Well I found out I could work around that and get the kind of job that I wanted. I found a job that was involving electronics.

The irony of that interview of that is this, our company now is larger than General Electric was at the time Mr. Boureg advised me that there was no future for radio.

DSM: That's a wonderful story! Now, you had gone off to GE, and you and Barney Oliver, Bill Hewlett and Ed Porter had sort of lost touch I guess.

DP: Actually Fred Terman had recommended that I take the job with General Electric because he said I would learn some things that would be very useful when we started our business later. He also said that Bill could benefit from some additional graduate work.

So Bill took some graduate courses at MIT, and I went to Schenectady. Ed Porter got involved with air conditioning equipment in Central Valley and did very well with it. Then Barney Oliver got into Bell Laboratories, so that's how we all divided up in that interim between 1934 and 1939.

DSM: Times were hard between 1929 and 1939. You had gotten married and you made the decision to leave General Electric. Can you tell me about that decision, and the decision to found what eventually became Hewlett-Packard?

DP: Both Bill and I were quite sure we wanted to start a business for ourselves. And as I said Fred Terman had told me that the time I spent at General Electric would be very useful, and indeed it was. I learned a great many things there, met some very interesting people that I have known since.

While Bill was at MIT he would come over once in a while and we would go skiing up in the Adirondacks. So we kept in touch but weren't closely involved during that period.

DSM: How did you get linked back up at Stanford in 1939?

DP: I drove back to Stanford in the spring of 1938. I wanted to see Bill again, but particularly, I wanted to renew my friendship with Lucile Salter. So I drove back and met her and we decided to get married, and that was in the spring of 1939. She came all across the company and we got married in Schenectady.

I didn't want the General Electric Company to think that I was going to leave, so I simply took Friday afternoon off. We had a honeymoon in Montreal, and I was back at work Monday morning.

DSM: So you come back to Stanford and you and Bill Hewlett form this company which has since really shaped the culture in Silicon Valley. What were the reasons for your company's success?

DP: I'm going to take a little time to go over some things involved there.

When I got back to Stanford, Professor Terman arranged for me to get credit for General Electric because there were some courses I took there. That first year I came back we found a house on Addison Avenue, and we rented the lower floor. It had a little cottage in the back where Bill stayed, and in the garage we set up a workshop. That was really the place where HP started, and that has been designated as a historic site in Silicon Valley.

DSM: Tell me about your partnership with Bill. What part of the business did you manage, and what part did he manage?

DP: Well Bill and I had worked so well together. We had similar backgrounds, and we never had any specific designation of duties. Fortunately it turned out if someone built something and Bill said he didn't like it, and they would bring it to me, I would give them the same answer. We just had a very close relationship.

When we started out, we didn't know what to call ourselves. We didn't know what we were going to do, but we did feel very strongly that we wanted to do something important. We wanted to make a contribution that would be useful and not just "me too," engineering. That was a very important guiding principle behind our long-term success.

DSM: Your first product, I guess the legendary product is the audio oscillator, and there is a legend about the sale to Disney.

DP: Back then, there was a new technology called negative feedback, developed at the Bell Telephone laboratories, and Fred Terman got quite interested in that. He had the knack of making complex matters looking simple. A group of people in his laboratory including Bill and some other people and they developed some equipment that was useful for audio measurement, and Bill's audio oscillator was one of those products. They also made a wave analyzer and a vacuum tube voltmeter and several other things, which eventually we could use later on.

DSM: One of the most famous stories is the story of the sale of this audio oscillator to Disney and its use in the movie *Fantasia*. Can you tell us about that?

DP: Yes, I can tell you that the story is greatly exaggerated.

DSM: Yes, I thought we would get the truth out here.

DP: Bill and I put together one of his audio oscillators and he took it up to an IRE (International Radio Engineers) meeting in Portland, and it generated quite a bit of interest, including the sound engineer of Disney, Fred Hawkins. He was quite impressed with this oscillator, and the only competition we had was an audio oscillator which was made by General Radio, which cost four-hundred dollars a piece. So we told him that we could make these for probably less than one hundred dollars. So we did that, but we didn't make any contribution to the technology of *Fantasia*. All we did was save them some money and make it possible for them to get the nine or so audio oscillators they needed for seventy-one dollars and fifty-cents, I think it was, instead of paying four hundred dollars. So there were no technical contributions. We just saved them some money.

DSM: Speaking of money, you grew up in Colorado during the "Roaring Twenties," and started school in 1929, the year of the Great Depression. That had some influence on your opinion on capital and finance. Do you want to talk about that?

DP: Well there were some factors that influenced what we did later on. My father was a referee in bankruptcy for the state of Colorado. In those days there was no title insurance so if you were concerned about a piece of property, you had to look up the background in the local courthouse.

I spent some time with my father doing this, and what I learned was, that those companies or people that mortgaged their property in order to borrow some money, wound up losing everything they had because the banks simply foreclosed on them. Those people who did not borrow money, they had a difficult time too, but at least they kept all their possessions. It was really that knowledge that made me decide that we were never going to borrow money as far as the company was concerned. We were going to make it on our own on a pay as you go basis.

DSM: Were there people who thought this was crazy?

DP: Well that's what we did and believed.

DSM: Another interesting story about your relationship with Charlie Litton and Litton Industries, something about a fire.

DP: Well that was very important situation. I came back to Stanford because of Fred Terman and the fellowship he gave me to work with Russ Veria. He had an idea of how to invent a vacuum tube that would work with higher frequencies. So they put up a five hundred dollar stipend, and that was what provided me some income. I was also doing work in the Registrar's Office, so that's how I got by.

Charlie Litton was a very unique person. He wanted to do things better than anyone else. That first year, I would go to college classes in the morning, and Bill and I would do some work in the garage in the afternoon. After dinner I would go and spend the evening with Charlie Litton. Charlie liked to start late in the day and would usually work until two or three in the morning. So this gave me a chance to work very closely with him. They said Charlie could do anything better than anyone else, and he wanted to build a new building. Instead of hiring excavators he bought the equipment and did the excavation himself. I worked with Charlie, as a matter of fact, I learned how to run a bulldozer and helped him lay about five miles of road.

Charlie also had some other interesting ideas. He was one of the first people to realize that the four-wheel drive vehicle was capable of maneuvering in the Sierras. They did that by taking two trucks and coupling them together with a beam, he installed a motor in it, and this became a four-wheel drive that he could get up and down the hills in. So when the after war Jeeps came out, he was the first to buy a Jeep. Bill and I also bought a Jeep and the first time we took it up in the hills we got stuck on rocks with all four wheels off the ground. After that we learned to handle them better.

DSM: Back to the fire that involved Charlie Litton, and the favor that you did for him. Can you tell that story?

DP: Charlie Litton and I got to be very good friends. Also, there's a very interesting story involved with that too. A man by the name of Cyril Elwell, who graduated in the first class of Stanford, was hired to look into some patents by some people there. In the course of that he ran into the patent for the Poulsen Arc. That was a Danish patent. So he went to Denmark and negotiated a license with these people and ordered some equipment, and he came back and tried to raise some money, he didn't have a cent. He did get some investors, including the first President of Stanford. So this background was really where Charlie Litton learned about it, and that company became the Federal Telegraph Company. They were competing with General Electric and RCA and those companies in the east. Charlie's job was to design the vacuum tubes that avoided one of their patents. So he was very clever at doing this.

The decided to move the Federal Telegraph Company to the east, and at that time, several people didn't want to move east. Charlie Litton stayed, and a number of others stayed on the west coast and Charlie decided to set up his own vacuum tube manufacturing company. But he thought that the equipment available was not good enough, so the first thing he did is design a whole line of equipment to manufacture vacuum tubes. One of the most important of these was a low vapor pressure oil vacuum pump. It was metal and it could produce a much better vacuum that you could get with mercury vapor tubes, which were used before.

Everybody in the country that was in this business knew what Charlie was doing. So we spent most of the time making this equipment and selling it to somebody else. He sold two gas-boring lathes that you need to make the big kilowatt copper anode tubes. He sold the first one to GE, the second one to Westinghouse.

DSM: Hewlett-Packard went on to develop leadership in many different areas. How did Hewlett-Packard develop its corporate strategy?

DP: As I have told you, Bill and I decided that we wanted to do something that would make a real contribution. We did not want to be a "me too" company. That was the basic philosophy that really governed almost everything we did.

DSM: No “me too” products. What would you say were the most critical choices you made in guiding Hewlett-Packard over the years?

DP: Of course the most critical parts were my trip to Palo Alto and my involvement in Ham radio. If it hadn't been for those two things, the Hewlett-Packard Company would never have come about. So those are key elements in the whole story.

DSM: You're also unusual as a company in that you are heavily involved in scientific instrumentation as well as computers. Do you think that has helped or hurt?

DP: We started out concentrating on instruments. The General Radio Company was one of the best known at the time making electronic measuring instruments. I remember seeing a General Radio catalogue when I was in high school, and kind of drooling over all the instruments that were in there. In any case, we decided we would concentrate on electronic instruments, and General Radio was kind of a mold for us. There was a man who started General Radio, called Melville Eastham, and he had some pretty unusual ideas about what a company should do. He thought that a company should make a contribution. A company should do things beyond manufacturing, like become involved in the community and so forth. That pattern is kind of what established a similar program for Bill and me.

Now, Fred Terman introduced us to Melville Eastham, and he came out and spent a whole afternoon with us. I knew by then he figured that we were going to be in competition with him, so I anticipated we might have a difficult time. On the other hand, he said, “Competition is a good thing, especially when you are developing new products. It's better to have two people developing them than one, because it makes it more credible.” So we maintained a very close relationship with General Radio even though we were competing. That was something that had quite an influence on what we would do later.

DSM: You were not an early developer of early computers, even though some of the early people who later made some of the earliest PC's worked here. And even though you had early leadership in calculators, why didn't you get into PC's earlier?

DP: Well that's an interesting story. We actually had a group in Europe that developed a personal computer, but unfortunately it didn't have any innovative features, and it simply wouldn't fly. We felt that we had to make a contribution. This is a case where it didn't do that, and it didn't work.

DSM: How would you compare the opportunities today in electronics to the time when you entered the field? Is this as an exciting a time to get into the field?

DP: There it's very exciting, but for some reason people don't recognize it. If you look at the technology we have put into place during the 20th Century, it all came from science which began some thousand years ago, and was essentially completed before the beginning 20th Century. That's when the atom was considered the smallest particle in the world, that it had neutrons, protons and electrons. That enabled the construction of the Periodic Table. You could design the Atom bomb. Shortly after the end of World War II, what we, the Soviets and our Allies in Europe undertook a very large program of high-energy physics. The Stanford Accelerator is one resulting example. That was done because we thought we might find something that would provide a decisive advantage. Well that didn't help them. What did help them is discovering that the atom is not the smallest particle in the world; that it contains ten smaller particles that have forces that do not follow the forces of gravity.

That provided a whole new ball game for the future. That's actually the basis for genetic engineering and it gives you many, many new dimensions to be developed. So the science of the future is going to be very different from the science which Bill and I were brought up on. This is going to be an exciting time in the 21st Century. It's going to be a time when exponential growth will be vastly greater than the time when we started.

For example, when Bill and I started we had exponential growth, but it took us 40 years to get up to a billion dollar business, and a good part of that was inflation. Our company started the 1994 fiscal year with 20 Billion dollars worth of worldwide business. We added 5 Billion dollars in new business during that year, and we are probably doing the same for the following year. Now of course something could happen to prevent that, but I think it's highly likely that that success will occur. So the 21st Century is going to offer much greater opportunity for young people than we had, to become involved in scientific and forward looking activities of this kind. It's something that is going to be a tremendous opportunity.

DSM: If you could give advice to young people coming out of college, what advice would you give to them?

DP: This is advice I would give to anybody, whatever you do, do the best you can. If you are doing a good job at whatever you are given, you're very lucky to get a job, so do the best you can, whatever your assignment and you can't go wrong.

DSM: One of the things that Hewlett-Packard is famous for, aside from its products, is the way it treats its people. Tell me about how you developed the Hewlett-Packard way of managing people?

DP: We were a very small company in our first few years, and Bill and I and our wives knew every person in the company and all their families. My wife knew when anyone in the company got married and they got a wedding present, and if a family had a new baby, they would get a baby blanket. So we were just one big happy family, and that is really what became very, very important for us.

We didn't think that the people at the top of organization should receive all the benefits. We took the attitude that everyone in the company was important, and for that reason we always had profit sharing programs and other programs so everyone participates from the lowest level on up. There is no special opportunity for any one group of people.

Now that's been a problem to some extent because we have very good people, and we have other companies make offers to them and we have lost quite a few people for that reason. But Bill and I take the attitude that we're very glad to have people that other companies want because that's what our company does well. Very often people who work for us and take jobs with other companies take along some of the HP way. So that's an attitude that we have kept from the very beginning and we continue at this time.

DSM: You were one of the companies, if not the first company in the United States to introduce the idea of flexible hours. What did people think? Did they think you were crazy?

DP: Well the idea for that came from Germany. We have activities all over the world and that program was used in Germany. So we transferred that here and it has worked very well. It's again, evidence that you have confidence in your people. It's an expression of confidence, and it represents the fact that we could accommodate some of their personal problems with their work program. It's turned out well, and as you know now many people use that.

DSM: Looking at Hewlett-Packard from the outside it looks like steady progress from the outset. Was there ever a time that the decisions you were making were getting really scary?

DP: That's a hard question to answer. I'm an optimist, and in terms of the various levels that we have gone through I've never really been that concerned that we couldn't accomplish what we set out to do.

It's very important that you have that attitude, because if you don't have that attitude, you won't be able to do it.

DSM: Looking back, there are so many things that Hewlett-Packard has done, and that you have done personally. What do you consider your most significant achievements?

DP: Well of course the company has to be the most significant achievement. No question about that. Personally, I would say some of my work with the Defense Department. That later influenced what we did here.

DSM: You worked with Melvin Laird, the Deputy Director of Defense?

DP: Yes.

DSM: This was 1969, 1970, during the height of the Vietnam War?

DP: That was in 1969, 1970, 1971, and we had been doing business for the Defense Department almost since the very beginning. I had no thought of any further role until one day Mel Laird and I were hunting on a ranch in Merced. I had met Mel Laird on number of occasions. He had been appointed Secretary of Defense by President Nixon. Actually to work with him I had to give up my income and any dividend or stock in the company. But I was willing to do that because I thought I could make some sort of contribution there, and I also thought it was my duty to serve the country and I only had this occasion to do so.

That turned out to be a very interesting experience. We did some things that I think improved the Defense management. It was a very large organization, and difficult to get what you want done. I always said it was like pushing on one end of a forty-foot boat and getting the other end to go where you wanted it to go. It was also a little tough on my wife because the first six weeks she lost sixteen pounds. She said it happened because she would get up in the morning and hear someone say something nasty about my husband, and that would spoil her breakfast. Then she would hear some further and that would spoil her lunch. Then I would come home and tell her terrible a time I had and that would spoil her dinner. She finally got over that when she stopped listening to the radio.

DSM: It's called the David Packard diet. That speaks to another issue, this business gives people who have a great passion for what they do, an opportunity to do wonderful things and change the world. It's also because of the growth of the industry and it's money and influence, it has given people like you and Bill Hewlett and Bill Gates tremendous power. You have tremendous power in the world now. Do you have any thoughts or advice about corporate responsibility and how people who have that power ought to use it?

DP: I think Bill Gates has done a great job with Microsoft and the Intel people have done a good job too. They have a good program.

I don't know what they would say is most important. I can only point to what I have told you, what we've done. I tell our employees that you are the ones who have built the HP way. Bill and I couldn't do it. You are the ones who can do it and that's why it has gone so well. That's really the whole story. We did this together and it works, and our people can and should be very proud of what they have done.

DSM: The HP way has always been making HP a great company and a great place to work and a great place for its customers, but also a good corporate citizen.

DP: Yes. I felt all along that a company has a responsibility to the community in which it lives and exists. That's the concept that stays in place. I remember going to a meeting in the early part of the war. One of the business professors at Stanford invited some of the area people to come in, representatives of companies of manufacturing equipment there and the discussion got around to the point of, "Do you have any responsibility beyond that of the shareholders?" And almost all of the people there said, "no" they didn't. I objected and said, "I don't think you are right. I think you have an obligation to your employees, to your customers and to the people in the community where you live." That was almost laughed at. But you know that policy has become standardized, and it should have become standardized before it did.

DSM: Your impact on this revolution is something you should be very proud of. I have one other technical question to ask, that I forgot, and that was to talk about your work on the Hewlett-Packard printer. Is that unusual, or did it develop from a strategic corporate initiative?

DP: There is a very important issue here. Our company has thousands of products. We have thousands of customers all over the world, and no one person in the company can even understand what is going on all over the world. So it's important then that people that know the markets, know what to develop, have the opportunity to do so.

We have gotten a little off the base in recent years and it's only natural that the president of a company wants to know what's going on, but it's really impossible to do it. People usually build up a bureaucracy around them and we got to the point where we had thirteen committees, all with a new product program. Well we got rid of all of them and now any person out in the field can introduce any new product program he wants to without even asking us. The proof is in the pudding, and if he does a good job, good. If it isn't a good job, well then you learn the hard way. So that's leading element of how you keep up with the latest technology.

DSM: One of the things one can't help but notice by looking at your life is that you have a lot more interests than just business. What are some of your outside interests? I know that you are a gardener and a reader and a fly fisherman. What do you love, besides business?

DP: I have had some other interests. We established a family foundation in 1964, and in that family foundation we have all our children.

We spent the first ten years or so just responding to all the requests, just like any other foundation. About the middle 1970's I decided we should be developing some programs of our own, instead of just doing whatever people requested. I have two daughters and a son and law and some friends who are active in the Hopkins Marine Station down on the Monterey Peninsula. They had been interested in an old cannery down there and they thought this would be a good place for a cannery. Stanford University was interested in this because they had bought the cannery as protection against commercial encroachment. So had a feasibility study and were told yes it was a viable program and we could build an aquarium there which would cost about ten million dollars, and it would be successful and it would pay its own way. So with that information we hired architects and engineers and proceeded to design the aquarium. Well I didn't know a damned thing about aquariums, but my wife and I visited every aquarium in the country, and my children visited some of the aquariums overseas.

What we learned was that most aquariums are built on a fixed budget, and they made short cuts. Some of the things they did behind exhibits caused corrosion. That wasn't a good situation. So I decided if we were going to do this we were going to do it right. So I bought some equipment that makes fiberglass-reinforced cement, and fiberglass reinforced plastics. Put up a shop there and found someone who had been building fiberglass boats, and we proceeded to do this. We built the background of these exhibits the way they should have been done.

The result was that the aquarium cost us forty million dollars instead of ten million dollars. My children thought we shouldn't charge admission so that poor people could come. I said we weren't going to do it that way, "If what we did was right, people will pay for it. If it wasn't right, we shouldn't have done it." In the meantime my youngest daughter, Julie, took over the job as Director of the aquarium. She did a great job. She operated it for ten years and not only paid for all of the costs of the operation, but she built up a thirty-five million dollar surplus to apply against a new wing, which we are now building on the aquarium.

DSM: So you have two daughters who are marine biologists.

DP: Yes.

DSM: And your son is a classicist, a Ph.D. as well.

DP: My son went to Phillips Exeter and he got interested in the classics there. He started out at Stanford in engineering, but he decided to change to the classics. He's become very capable on the classics. What he did was use the computer to find out what some of the background on the classics were. Specifically, there is an ancient language of Crete called "Linear A" that has not been deciphered, and he found a way to do that.

From that he built up a model of a computer designed for the classics, and on a compact disc he built a record of all the classics from the very beginning. That disc can do the Concordance in about two or three minutes and it used to be about a year's work. So that has been very successful.

DSM: You have had a lot of successes. What is admirable on your CV is that you've got listed alongside the Presidential Medal of Freedom, the Good Scout Award from the Boy Scouts. So you have had a lot of successes. Have there been any major disappointments?

DP: There haven't been any major disappointments other than the loss of my wife. That was terrible. But other wise no serious troubles.

DSM: That's good and very fortunate. One of the things we are able to at the Smithsonian is, we're hoping these materials will be around for the next two, three, four hundred years. I've finished my formal questions and I was wondering if there is anything you would like to say. Things that you would like to be sure get remembered?

DP: Actually there are some things that fit into this.

The Library of Congress has the largest collection of marine material of any library in the world. Jim Billington who is the director of that laboratory is a good friend of mine. What we're proposing to do over the next several years is to make it possible for every classroom in the country to see what's going on in the Monterey Canyon on a real time basis. This will be done with a feed from the Library of Congress and another feed we have up here from Monterey. That's going to be a good project because it will give people a much wider vision of what is going on in the world than what they have so far.

DSM: That's a great vision. Last question. You have had a marvelous life and success. You seem as good-natured and even-tempered as anyone could be. Is there anything that makes you mad?

DP: Lot's of things make me mad. The whole world is in very bad shape now.

DSM: It's seems that with the end of the cold war, and the lifting the threat of nuclear war, and all the things that you've talked about with the developing sciences, that this should be a golden age to look forward to.

DP: Well of course we spent the better part of this century trying to get rid of communism. Now that we've got rid of it, we don't know what the hell to do with it, unfortunately.

DSM: Well I can't tell you how much we appreciate you spending this time with us. This will become a part of the permanent research collection at the museum. Thank you so much.

DP: Thank you, it was a pleasure.