

INTERVIEWER: Can you tell me first where you were born and what it was like growing up in Greece?

HATSOPOULOS: Be glad to. I was born in Athens, but to get a lot of the things we're going to talk about, it would be useful to give you some background.

My family, there's an extended family that is very close. That extended family includes my, the cousins, the brothers, the cousins of both my father and my mother. And it is very typical of some traditional families in Greece to be very close knit. And the reason this is particularly important for me is that that extended family has had a very important influence in what I've done in my life. And I'll give you the background, for instance, a little bit.

First of all, both my parents, and the ancestors behind my parents for the last few hundred years, came from one place in Greece. A town, a small mountainous town called Karpenisi. And that town was built after the fall of Constantinople, and particularly designed to be not, to have a chance to be not found by the invading Ottomans. So they chose a place in the mountains where the mountain grows up to a certain height, and then there's a depression in that particular mountain. That mountain is called, I'll pronounce it in Greek, Tymfristos. And it's very close to mountains that people around the world may hear, may know. Like Parnassus, or like Olympus, where the Olympia gods are from. These, this mountain range and the various mountains, and this town comes from one of those mountains.

And the town is at an elevation of about, close to 1000 feet. To 1000 meters, which means about 3000 feet. And it's in a depression in the mountain, and around it the mountain grows much higher. So it's very hard, anybody that doesn't know that the town exists, to find it. And that was the purpose of building that town there, around the middle of the sixteenth century, when Constantinople fell to the Ottomans.

And both my parents came from there. My parents came from two families that were at odds with each other for at least 100 years, maybe even longer. In fact, for the last 100 years before I was born, both my grandparents -- my grandfathers, the two grandfathers, one is my mother's father, and my father's father -- were members of Parliament from opposing parties. The one party was kind of the Republicans, the right wing, and the other one's like the Democrats, the left wing. And they were, for at least 100 years -- probably more than that, maybe 200 years -- they were at odds with each other.

But finally, a miracle happened, and one of their descendants, namely my father, married one of the other people's descendants, namely my mother. And the two families got united.

Now what's that got to do with me? It has to do with me in various ways. And let me tell you one of the principal ways. On my father's side, there were a lot of cousins of my father that were engineers. And four of them were professors in the most prestigious university in Greece at that time, called Athens Polytechnic. The prestige in Greece of Athens Polytechnic is very similar to the prestige in France of the Ecole Polytechnique in France.

To give you an idea how important that was during my teenage, we all knew that anybody that graduated from that institute probably would have employment for life. Because that was the top. It was considered the top. Four of these cousins of my father were professors, and three of them at some point became, were elected presidents of Athens Polytechnic.

Now what's that got to do with me? It has to do that the family was -- not committed, kind of -- thought that they should develop a new president of Athens Polytechnic among the young generation. And there were many kids my age -- I was a teenager, and there were some that were younger. Actually, that whole thing started when I was seven years old, and I was told that I was a candidate to develop to be the president of Athens Polytechnic.

INTERVIEWER: No pressure, though.

HATSOPOULOS: A lot of pressure. Of course I had to live up to that objective. And over time, I became the leading candidate of all the probably a few, many dozens of second cousins I had, and so on and so forth, partly because many of them were women, and of course that disqualified them. But even those that were young men, the family didn't think they had the talent to become a great engineer, a great scientist.

But because I was tinkering, ever since I was three- years- old, with machines, and instead of playing with the kids, I was always tinkering with machines. For instance to give you an idea, at a big party at our house, back in 1934, 1934 I was six- years- old. And I was -- my father said to some of his cousins that were at the party, won't you come and see what my son has done?

And now what I had done was, I wanted to -- I wanted to build a projector that would show pictures on the wall, like a movie projector. And it took me quite a while to figure out that I had to find a way of finding a lens, a source of light, a lens, and then focusing that lens on something that had a picture but was transparent. So I used cellophane paper and drew some drawings there. And I finally made a projector at about the age of six or seven, that would project on the wall.

My father was very impressed with my achievement. So that, in his mind, made me the premium candidate for president of, future president of Athens Polytechnic.

And from there on, the pressure was on. I had to live up to that picture that everybody expected. And that continued to influence me.

Except, over the years, I developed another liking. And it happened as follows. You have to understand -- and this is difficult for Americans to understand at this time -- in Europe in the 1930s -- and I know that because there were a number of my uncles that brought friends from France, from Germany, and other countries in Europe. In Europe, they thought that Europe was the ultimate in science. And their opinion of America was -- in science was very low. They thought that Americans had great inventors. They all had heard of Thomas Edison and many others, but not scientists.

And therefore -- but you see, I got thrilled with the idea of learning more about Thomas Edison. So when I was, at the age of 14, I was in high school. I was a sophomore in high school. And at that time, everybody that saw me do various mechanical and electrical developments, that was instead of playing ball with the other kids, they kept saying, you're Thomas Edison, that's what you are. You're Thomas Edison.

And that's fine. That's great. In fact, the combination of Thomas Edison with a good scientist -- because they didn't think that Thomas Edison was a great scientist, but he was somebody that would translate science in something useful. And of course they knew that one of the greatest things they knew about Thomas Edison is that he invented the light bulb. And so I start studying Thomas Edison.

And I had plenty of time to do that. Because in my junior year in high school, which was 1942, high school was shut down 85 percent of the year. Why? It was the middle of the war. You have to understand that, in Greece in 1942, there was tremendous hunger. In Athens, where we were living, there were dead people found in the streets. In fact, they had a truck picking up all the dead people in the streets. Dead from hunger, mostly. And so it was very hard trouble.

There was also a lot of activity against the Nazis. And that activity, the underground activity, was very strongly encouraged and supported by western countries, like England and the United States. In fact, so the guerillas or the -- many of whom I knew weren't my age, were older, the age of my father. I'd known them, I knew them. And of course, what happened is that the Nazis, the German Nazis, wanted to, had to do something about this uprising, this potential uprising of the guerillas. So the institute had ruled that if a German soldier in Greece ever got killed, the next day the Germans, the Wehrmacht, would pick up 50 Greeks at random and execute them. And not only that, but all the newspapers had to, the first page, print the people that were executed. That happened probably at least half a dozen times that I can remember during the four years of occupation of Greece.

And of course there were all sorts of things that caused the high school to be shut down most of the time. There were riots, every time that things happened like this. And of course, the high school had to shut down.

So that was very good for me, having the high school shut down, because I spent all my time in the library. And my first object is to learn more about, who is this guy Thomas Edison that all my uncles said that I may be the next Thomas Edison? Although they would like that, of course. But I also wanted to develop into a good scientist, so that I can qualify for professor at the Athens Polytechnic, and potential president.

You have to understand, Athens Polytechnic at that time was semi-private, which was unheard of for Greece. Most of the institutions of higher learning, like the universities, were government run. The Polytechnic was supported by some very rich Greeks outside of Greece, and they gave a big donation, provided that the Polytechnic would be self governed. So it was governed by what they called the Senate of 12 senior professors at Athens Polytechnic. And they were, they would run the whole thing. The government had no right to interfere what they decided. And they would select the president, as well.

You have to understand that four of these 12 were my uncles. So it was a foregone conclusion that if I came anywhere near qualifying for what they thought I should, I would be -- it had, it was fait accompli that I would become president.

INTERVIEWER: You were also, aside from being in the library, you were involved in some radio activities.

HATSOPOULOS: Oh well, yeah. That's true. A lot. I had a lab in the basement of my house.

Now you have to understand that when the German army came, occupied Greece, the first thing -- we lived in a suburb of Athens, which was very high up. Very beautiful houses and so on. So the German army came in, into all the houses, including my house. Including, my wife grew up in a house a few blocks away from there, although she's much younger than I am. And they came into all the houses, and said -- they came to my mother, the German Commandant, commander of the area. He came to my mother and said, Mrs. Hatsopoulos we need half your house.

And my mother knew that they would take it. I mean, it's just like this. But we'll give you a chance. We need to house two of our officers. And they did that with every other house. They needed to house officers. The soldiers they had were housed in tents, and in-- but the officers they wanted to be housed in houses. And he said to my mother, says, you can select which part of the house you want to give us, so we can make it rooms for our soldier-- our officers. They were very polite.

And so came to a settlement. To give you a sideline of what happened after that, I was -- they, the commander promi-- said to my mother, they're very good people, these officers that are here, and they're very good gentleman. You don't have to worry about anything, they'll keep the house in order. They're not going to destroy anything, like that.

But one day, one of the two brought a prostitute in the house. And that, my mother got very upset by that. And so she went to the commander and complained. She says, you told me that these were gentlemen. And this guy in my house, that you put in my house, brought a prostitute and stayed all night with her.

So the commander said don't worry Mrs. Hatsopoulos, we'll take care of it. So, the punishment was, so he did, what that officer, a lieutenant was ordered to do was -- around the house we had pebbles, some of which were very sharp, because there were pieces of rock that was broken up. And these pebbles were to, so that the rain doesn't dig into the ground as it fell. So it was all around the house. So this lieutenant that committed that irregularity to bring to our house a prostitute, was ordered to crawl on his knees around the house several times. By the time, when he finished his sentence, he was bleeding all over. In fact, I felt so badly -- I was a kid, I was 14 years old, and I was horrified. This guy was suffering.

I'm telling you all this to give you the climate. You know, on one hand people were dying, other people were being executed at random. But even so, the Nazis were also very, very rigorous in their discipline of their own people. Anyway.

INTERVIEWER: So, why don't you tell me about the radio activities [OVERLAPPING VOICES]

HATSOPOULOS: I'll tell you why. I'm leading up to that.

So now in the basement I have these two officers. And my mother said, you should be careful what you do in your laboratory downstairs, because. I said, why should I be worried? I don't know, you know, something that may bother these Nazis.

Well, of course, there was something that would bother these Nazis. Because I decided to do something that was clearly punish -- very clearly punishable by death. And let me tell you what it is. They came in to the house one day, the Gestapo, and says Mrs. Hatsopoulos, show us how many radios you have in the house. And my mother said, oh, three or four. Show them to us.

So they went around, all the four radios, and sealed the radio, the dial in only the German station. And said to my mother, we're going to come and inspect all these radios periodically every few months. And if the seal of any one of those radios is broken so that you could hear some other emission, transmission, not to our liking, you're going to be sent for execution. Not only you, your husband and your two children as well. So that was the warning.

And of course, my mother took it very seriously and wouldn't even let me come close to those radios. Because she knew I was tinkering all the time. But there was tremendous -- I knew as a teenager there was a tremendous demand to hear news from the outside world. So I came up with the idea of building a radio, a short wave radio to hear BBC, that was transmitting all the news.

And I did that in the basement. The Germans were upstairs. And among my buddies, boys and girls, I became famous. Because I knew what was going on in the outside world.

And one day, the father of one of the girls in my, among the group of friends I had come to me and says, George, I know that you have built a radio that can listen to BBC. I said Mr. Tassis, whoever told you that? That's not true. I mean, I haven't done anything like that.

Oh, come on now George. I know it. And let me tell you. I swear that if you level with me, I'm not going to tell your parents. Because I know your parents will be very unhappy to hear that. But I have a proposition to make. If, based on -- you take my word, I'm not going to tell your parents. You build a radio for me, and I'll pay you a lot of money, so that you can buy a lot of material to build as many radios as you want.

By the way, buying material for a radio was in itself a major enterprise. Because there were no shops that -- see, to build a short wave radio, I needed vacuum tubes. You know, there were no transistors at that time. And there was no place where I can buy vacuum tubes. But there was a junkyard down buried outside of Athens. Quite a walk, maybe five miles walk for me to go to the junkyard. And in junkyard, there was piles of old stuff. And in that pile, there were some old radios. And I could go in, I pay an entrance fee, and I would find vacuum tubes there, bring them back to my lab, design a radio around each vacuum tube, and make radios.

And that was my first enterprise. My first venture. I tell you, it was very successful. Very dangerous. Because if I was caught, I wouldn't be here telling you that story right now. But nevertheless, it was -- you know, I have -- I always, I was born -- being an entrepreneur is a bug. It's an affliction, if you want. And I have that. I always had in my life, I always thought about that. And in fact, it made me very curious to find out, this first company -- the company, the most important company that Thomas Edison built was called General Electric. He built it, he founded it in 1872 or thereabouts. And it was very successful.

But he lost, as I found out, he lost that company five years later to the banks. Because he borrowed too much money. So then I decided, for me, if I wanted to do the same thing for my first enterprise, I better study finance, and accounting and everything. Which I did. I was 12- years- old. And I said, maybe I'm not going to be as great an inventor as Thomas Edison, but I will be a better businessman than Thomas Edison.

And so that is when I came up with the idea of forming a company. In fact, I picked the name. Thermo Electron, which I finally founded in '56 in the United States.

INTERVIEWER: I want to -- I have lots of questions about that. But can I just ask, with this family background and this sort of, this path that was written for you, that you were going to become possibly the president of this Athens university, how did you wind up coming to MIT to study?

HATSOPOULOS: Well, I had decided -- my design was, I wanted to build a company. And I designed -- my concept of a technology company is, pick a lot of engineers and scientists, and physicists and chemists and so on, so forth. Have a group of outstanding people. And then look around, what is an emerging need that society has? And see if you can find solutions to that. And dedicate the company, not only in any one business, but in the business of creating new businesses. That was my model.

And the reason I decided to call it Thermo Electron, that was, I'm talking '42, and I finally founded Thermo Electron in '56. So '42 to '56 is what?

INTERVIEWER: 13.

HATSOPOULOS: 15? Yeah. Years. The reason is that the invention that I came up with for that company is to convert heat into electricity by boiling off electrons. Now, stop me if I make, go into too much detail.

You know, how do we produce electricity in the world right now? Man. Humans. They burn the fuel. They raise mostly steam. They run a turbine, and the turbine runs a generator, and they produce electricity. Now there are several other ways. Primarily that's what it is. Or a gas turbine uses a fuel that runs, and runs a generator. Okay.

My idea was, why don't you make that a much simpler process? Use the heat to, instead of boiling off water, by boiling off electrons. And that was the idea I had, and I studied that. And I knew that there are certain materials -- one particular material, by the way, is a very rare material called iridium. Right now if you, it's on the periodic tables, you find it. If you want to buy iridium, it costs about 10 times more than gold costs. It's a very expensive material.

But that, if you heat it up to 2000 degrees centigrade, it emits electrons. And if you have a plate, a cool plate, nearby to collect those electrons, you essentially convert heat into electricity. And since thermo is the word for heat in Greek, electron is the word for electricity in Greek, I decided that the proper name for my, the company based on that invention is Thermo Electron. Which is what I did.

And not only that, but when I did build Thermo Electron, I would not stop on that invention only, I would just look at finding inventions, not by myself only, but by getting a lot of people that are very knowledgeable, and say look. For instance, the second device, the second business we did -- the boiling of electrons is called thermionic energy conversion. You can look it up in the Encyclopedia Britannica. In Greece, an early version of the Britannica had my name in it, under the name of thermionic converters.

INTERVIEWER: Started in a garage in Belmont? Started in your garage in Belmont.

HATSOPOULOS: I sure did. Yeah. See, you know a lot more. Where do you read all that?

INTERVIEWER: I researched you.

HATSOPOULOS: You did? Right. Anyway.

So, and that is particularly of interest. You see, I thought it would be broadly used. But it wasn't. It's still not used. Primarily because of the expense of the material that is needed. And therefore, there's no way you can compete with the other ways of producing electricity. It's too expensive. On the other hand, in some places, there's no other way of doing it.

And that was recognized in early years by the space program, NASA. And they funded a lot of our work. Because we could build a generator that, using nuclear fuels to provide the heat. And you could produce 50 megawatts of electricity in a little tank the size of a waste paper basket. Which of course is ideal for space travel, space power.

Now the person, however, that really got thrilled with that invention was a man that was brought into NASA by President Kennedy from Germany. Have you ever heard of Wernher von Braun?

INTERVIEWER: And Alma.

HATSOPOULOS: Is that right?

INTERVIEWER: His wife, his wife is quite famous, too. I think she was married to Wagner.

HATSOPOULOS: Yeah. Right. Okay.

Anyway. Wernher von Braun, I remember one day -- and I think that incident describes, essentially, how I ran Thermo Electron, what the mission of Thermo Electron was. I went to Washington to get, because I was getting a lot of support from NASA. So finally I was invited to meet Wernher von Braun. And we talked about, his dream was to send man -- now, the moon is piece of cake-- to send a man to Mars, that was his dream.

But the only way you can send a man to Mars -- and I don't want to explain the details -- is by using what is known as ion propulsion. Where you propel, the back of the rocket, material at extremely high speed to give you a lot of push. And you can do that if you -- the only way you can do that, if you have a lot of electric power, to accelerate ions, which are charged molecules, outside the spaceship.

But you need a tremendous amount of power. And the only way you could do that is by using a nuclear reactor, but that wouldn't fit in a small space ship. So the only way to do it is a thermionic converter.

At the end of that meeting he said to me, I'll give you a contract tomorrow morning for \$28 million to start working on my reactor for Mars. And it was fantastic. \$28 million for our company -- it was still a very small company. And probably worth today maybe five to 10 times as much. I mean, hundreds of millions of dollars now. It was fantastic.

So I take the plane back to Boston. It was an Electra propeller plane, so it took a little while to come to Boston. And I was reading the *New York Times*. And the main article, the editorial of the time, was criticizing President Kennedy for spending billions of dollars to send a man to the moon. When we have so many needs here in this country, and we need that. And he's wasting all those billions of government money to send -- to a crazy idea to send a man to the moon. So it dawned on me right there that the space program, after we land on the moon, will be gone. So there's no, Wehrner von Braun was dreaming. There'll be no, never go a man to Mars. Or not in our life, not in our century. Maybe in two or three centuries later, but not in our century.

So therefore, this was not the business we should be in, who has as the ultimate goal to make generators, nuclear generators for space vehicles. So we had to find another thing that is needed in society.

So I turn the pages of the *New York Times* and found that the disease that killed more Americans every year is heart problems. And so I decided right there, that's our next business. We're going to make an artificial heart.

INTERVIEWER: Did you not take the \$28 million?

HATSOPOULOS: Oh, we did. Oh we did. In fact, that's how we built our artificial heart. Because we had enough profit from the \$28 -- all these engineers I had, and you know, in order not to cheat, they were being paid by NASA, and I had them work on artificial heart. So what I told them, I said look guys. I'm going to, I don't have money to pay you. You have to get paid by NASA. So your work week, 40 hours a week, you have to work on NASA. But if you want to work on our new next vision -- which right now is the artificial heart and tomorrow may be something else -- you have to do it at your own free time. And I can't pay you. But I can give you stock options. So if we succeed, you're going to make money that way. But I don't have the dollars to pay you.

And they all said -- uniformly, they said, you're on. We work, at 5:00 we finish our work for NASA where we get paid. And then we start working on our new projects. Which they did. Not only on the artificial heart, but they did it several times.

Because at the end, we built -- when I retired, we had built 23 companies, very successful companies. Which we owned, Thermo Electron owned controlling interest. Most of them had been taken public, but Thermo maintained its majority control of that. So that's how we built the company up. And we used the government to support our engineers, and they donated their free time to do all the new things.

And today, by the way, my successor -- the reason I left the board of Thermo Electron, in 2000, after I retired I brought a successor. And unfortunately that successor did something that I didn't like at all. He said we're going to dismantle this whole idea of -- we're in one business. We pick one business. The biggest business at that time was Thermo Electron analytical instruments. So we're going to be only analytical instruments, out of the 24 businesses we're in. And we'll sell off all the others. And one of the things he sold off that was the dearest to my heart was the artificial heart project. Right now the company that bought it still has, is the leader in mechanical hearts. They probably have about 2000 or 3000 people around the globe that live on mechanical hearts.

Now of course, having a mechanical heart, you have to be plugged in. Because there's no heart, it requires a lot of power. And there's no battery to do that, so. But you can wear a battery outside, actually you can walk around. But then you have to recharge the battery every day.

So anyway, that is the background, how we -- I told you the first venture. I tell you my next, I told you the next venture. I told you the third venture, right? So we're out of three out of 25.

INTERVIEWER: So I want to ask about the structure of how you set up Thermo Electron, because it was unique at the time. But I want to go back to get a couple of answers about your time at MIT, because we haven't really spoken about that.

HATSOPOULOS: Oh. Oh yeah. But you see, then in 1942 -- the next question is -- I'll emulate Thomas Edison. But what country I should do that? And I knew that if I asked my father or my uncles, they would say where -- France, Germany, England. That's all they knew.

But I got intrigued with the environment in the United States, which is really -- and you know, this is the answer that people have asked me to questions. They ask me to give lectures in Europe many times. And I did give a major lecture in 2002 in Germany. And they say, why is the United States creating all these new enterprises, like Intel, like Apple, like and so on. Do they have better scientists and engineers than we have here in Europe? And my answer is no. In fact, in some respects the scientists in Europe are better than the -- at least, before the war. Right now of course, that has changed quite a bit.

They say why, if we have, if we have just as much technology capability, why can't we create completely new enterprises like America does? Like the Apple computer. Like many other things. And the answer, I said, I've studied that. Because I ask myself that same question. And I tell you, it's just a matter of the culture. The culture in America is entrepreneurial and risk taking. The culture in Europe is conservative and traditional. And that makes a huge difference. I said -- and I said that in 2002; I'm paraphrasing something I said in that lecture in Dusseldorf. It was in Dusseldorf I gave that lecture. In English, by the way. Because although I spoke German, by that time I had forgotten my German. But I gave it in English.

I'll give you a story. A few years back at that time -- meaning sometime in the '80s or early '90s, we developed a machine, mammography machine, to be used by women to do mammograms. And that had many advantages. And we went around to the United States' hospitals, and we said we have that machine, it has these advantages. They would say, give us, lend us a couple of units so we can try. And if we like it, we'll buy a lot of those machines.

And so that business was thriving. And as a matter of fact, in the mammography field, the leader at that time for mammography equipment was General Electric. And as we introduced our new product, we start taking market share from General Electric. And because I was on the board of the American Academy of Engineering in Washington, which the CEO of General Electric at that time. What's his name? You know.

INTERVIEWER: I only know Jack.

HATSOPOULOS: Jack. Jack. Jack Welch. Yeah. And I met him in Washington one day. He said, George, you are really taking market shares from us. And we started having a discussion. Why, how can you, you have better scientists? I said, no, I don't have any better scientists than you, Jack. I know your people in Albany, in the research center. And some of them are fantastic. But they don't have the right culture.

You see, try it. I said Jack, go and ask your engineers in Albany, what is their dream? The ultimate dream. Many of them will tell you, the ultimate dream is to get the Nobel, become a Nobel laureate like Langmuir. Langmuir, was working with General Electric back in the '30s, and got the Nobel Prize.

I said, ask that question among our engineers, and they'll say -- say, would you like to get a Nobel Prize? Oh, why should we get a Nobel Prize? We're not as it -- all we want to build is something that is useful, and helps people. And become famous for helping people. Not become famous for -- you see, it's a different attitude. What do you aim for? And if you develop people to aim for what you believe is the objective of the company, then you'll succeed.

INTERVIEWER: Wasn't it also a function of having a smaller, more nimble company?

HATSOPOULOS: Well, not -- the question you ask, is that a function of having a smaller company? I'm glad you asked that question. Because it is not. Unfortunately, it's a function of having a company that is the people who, together -- and it has nothing to do with size. If you, if you have people that grew to -- started from young people that just came out of college, and worked together, and developed that ideal during the years, and they have accomplished something, then they maintain that idea. Even if they become very big. In fact, they maintained that idea at Thermo Electron, even when we had 26,000 employees, which is when I retired.

So it doesn't have to do with size. It has to do with culture. And the only way you can control culture is to take young people before the prejudices are set in their minds. And grow with them, and help them have visions and aspirations different than others.

Oh, by the way. So, to finish the story of the mammography equipment, soon after I talked to Jack Welch about it, quite a bit of time, we decided to go to Europe with that mammography. And we did the, exactly the same thing as we were doing in the United States. We go to a hospital and say, we have that thing that does a much better job.

What's the name of your company? Thermo Electron. What? Thermo Electron. Get out of here. We only buy things from either Zeeman's or Phillips. Thermo Electron? Don't know. You see, it's a different attitude. You see, not a single hospital director questioned, why were -- they could have said, here, you know General Electric, you know, we know General Electric. And who is Thermo Electron? A new start up? We don't want it.

But the environment here accepts new startups. And the environment in Europe does not. And that is the key, the whole key to the development. And I said, if you want -- I told that to the Germans in 19-- in 2002. If you want to change your ways, you have to change your culture. Become more entrepreneurial, and help develop brand new companies.

Because right now if they asked me to run any company, and I thought of that -- not right now, because I'm too old. But even before I retired. Suppose they asked me to -- and somebody asked me that. Suppose, George, you've become very well known as a manager. Suppose that your company's, well at the peak the company had shares about \$4 and a half billion, and had a market cap of \$15 billion or something like that. Suppose that somebody comes in and says we want you make you a CEO of General Electric, that is 20 times your size, and world famous. And has many tremendous capabilities. Will you take the job? I would say no. And they'll say why? Because you don't like to deal with a company that big? I say no, no. I don't mind that at all. In fact I love it.

So why wouldn't you take that? Because I didn't develop those people! You see, these people are all people, all the people are used to a certain mentality. How can I -- and they're probably going to have 300,000 employees. How do you, I change the culture of all these people? I can't do it. I have to start from scratch.

You see, now that has its disadvantages. Because then you can't -- Thermo Electron, for instance, right now is not quite what it was. Because I made a mistake. I chose the wrong successor, that's all.

You ask me how did it come about with MIT? And that's a good question. And I told you that I have to go a little further than giving you a straight answer, to give you the background.

The first thing that led to MIT was when I decided what country I wanted to build that company. And I gave you a lot of preamble why I decided that the only place I could go and do that is America. The United States. And that, of course I knew, would be anathema to all my extended family. But I had to. I wouldn't tell them; I'm just going to cheat, and tell them I'm going to -- I find a way around it. And I did.

First of all, I managed to compete in a major scholarship. I got a tremendous scholarship in February of 1948, that I could go anywhere around the world to continue my studies. I hadn't finished Athens Polytechnic. I planned to do that after I finished, but I hadn't finished it yet. But it was a unique opportunity. And then I took-- I won the scholarship. It was fantastic: everything paid for five years, including travel and including room and board and tuition, everything. I could go anywhere. So I started -- I decided to go in the United States. So I started finding out where in the United States.

And two institutions drew my attention -- MIT and Caltech And I studied, and I decided that MIT was better. Not only because it was, had grown bigger than Caltech, but also there's another very egotistical reason. It was closer to Europe. You know, Caltech is too far away from Europe. So I decided I'm going to go to MIT.

And I applied at MIT, and it was too late. I missed the deadline, and I had somebody I knew in the United States to go and beg for me to, for them to accept a late application. Which they did. So they accepted me. And in --

So I went and told my mother. And my mother says, George, congratulations. That's fantastic. I know your father won't like it that you're going, that you want to go to the United States. But well, if that's what your heart, you do your way. But you have a problem. I said what's my problem? She says, you don't know, you don't speak any English.

See, at that time I knew French, Greek, and German. No English. I knew a little bit, but I never took, studying. So I said to my mother, oh my God, yeah. And I had to be there in August. I'd better learn English between now and -- it's February. I said, Mother, can you find -- can you help me find something? She said, I have a friend that is a professor of biology, and she studied in America. And maybe she has a good suggestion.

And the suggestion that lady made was that I could go -- it's February. I had to learn English by the time I'm leaving for America, which was the end of July. So she says, have your son come in every night at six o'clock for one hour -- every night, Saturday, every night. And I'll teach him English

And I did. And I came meticulously. I was there every night over that period. And as I came to that house, which was a few blocks away from our house, there was a little girl playing. I never paid any attention to it.

Anyway, to make a long story short, in 1956, the year I created the company, I went to a party. And I found -- and a party, a dinner party. And I had a girlfriend, who was begging me to marry her for several years. I said, I'm not getting married at all. Anyway. So I went into that. And I saw a very attractive lady. And so I went and start talking to her. I find out she's from Greece. What part of Greece? Athens. What part of Athens? [INAUDIBLE]? What part of [INAUDIBLE]? You don't happen to be the [INAUDIBLE] girl that was there where I was learning English? She was.

And as I was leaving, my date says George, I have some advice for you. If you -- I know, you know I know you. If you like that girl, you're going to date her. And if you really fall in love with her, marry her immediately. Not tyrannize her as you tyrannized me, and I became bitchy.

So I told that to Daphne after we got married. I said you owe that to Dorothy. Dorothy was the name of the girl. Who, by the way, has -- she called me recently. And she has two grandsons at MIT. She came from MIT, too.

INTERVIEWER: When you first got to MIT, do you remember what your impressions were? How was it different from Athens Polytechnic?

HATSOPOULOS: Well, one major difference that I found -- which were two major differences. One was, which really was very key, is that you could spend time with a professor, as a student, with a professor, asking him questions, in private. And for me, that was very critical. You know, you don't do that in Athens Polytechnic. You know, you listen to the lecture, you get the book. You learn that, it's all there. You know, the professor's not going to take the time to give you individual lessons.

That was very important for me. Because first of all I don't go -- I don't want to go to lectures. In fact, when I came to MIT, after awhile I found out that attendance to the class is not mandatory. In Greece, it was mandatory. Not being mandatory, I wouldn't go to class. Because why waste my time to hear the way the professor -- the professor assigned -- you know, all I wanted, the professor to assign me a problem. And tell me, what should I read in order to solve the problem. That's all.

And you see, my whole preoccupation is to how solve problems. The only reason you read something that others have done, or you study something others have done, is because you want to solve the problem. And studying that, why wait until the professor has to expose his own-- you waste my time. I want to take the book. I know what I'm going to have. I go through the book, I find exactly what I want, and I get it done. So that was a huge improvement for me. And in fact, it worked for me very well. I learned a lot more, much quicker, rather than going to class.

INTERVIEWER: How important do you think it is to break the rules?

HATSOPOULOS: If you have -- it depends on the reason you break the rules. If you break the rules for a very legitimate reason, of course you're right. But most of the time, people break the rules for reasons that have nothing to do with their purpose.

You see, you shouldn't lose sight of your purpose. What is your purpose? Is your purpose going to school to become a better engineer, so you can help society? Or is it for you to get a degree so that you can get money, get a better position in your firm? It depends on your purpose. If your purpose is to become an engineer, everybody becomes a better engineer, or scientist or whatever -- even lawyer, or whatever -- knowing how you know, I know exactly -- what is the best way to educate myself?

As long as my purpose is to educate myself for a good reason. Not to educate myself to be a better extortionist or to be a better gangster. Because that's not -- if I had the ambition to become Al Capone, that would be a different story. But whatever I decided to achieve in life -- and it's very important. It's not with your purpose is acceptable. It's the purpose, is that what you're committed to? You may be committed to become, to become a better gangster than Al Capone. Why? I wouldn't know why. But maybe you have. And if that's your purpose, and you decide that's my purpose in life, then you adjust your education accordingly.

My purpose in life was not to become -- see, I never had the purpose in life to become president of Athens Polytechnic. That was, who wants that job? I mean, that's ridiculous. But I'm not going to push it away, because if I fail in my, what I really wanted to do, maybe I have, let's say a fallback position.

But who wants to do that? I want to build a company that is at least as good as the company that Thomas Edison built.

INTERVIEWER: So how do you think, because you did study at MIT, how did that affect the way you went on to then form your company? Is there a connection between the two? Did MIT help you do that? Did it make it --

HATSOPOULOS: Oh, are you kidding? Unbelievable. You should be present to a meeting I'm having, early December at, with the current president of Thermo Electron, the last president at Thermo Electron. The president of MIT, Susan Hockfield is going to be there. Her assistant will be there. And the main purpose of that meeting -- it's going to be a three hour meeting -- is for me to explain why MIT should be considered as cofounder of Thermo Electron.

INTERVIEWER: Tell me why. Not the three hour version, though. The shorter version.

HATSOPOULOS: Well, the support they gave me was unbelievable. Unbelievable. What's your first name again?

INTERVIEWER: Toby.

HATSOPOULOS: Toby, the support was unbelievable.

First of all, when I came in, the welcome-- I always felt that, I don't know why, there was, everybody, the professors, it seemed to me they gave me preference to everybody else. Preference to Americans. It could be, I've thought about it. I mean, it's very unusual. I think it had to do with the Second World War. You see, because I was the first foreign- born student to come after the Second War at MIT. And I think that, and I got just fantastic support and attention.

Alright, that's minor. When I wanted to pick my thesis -- and that is probably one of the number one key answers to your question - - I was given various opportunities to do a thesis in various things. In fact three professors, I remember, gave me -- they each had their own ideas of what is the best thing to do my thesis. They were all exciting ideas.

But I told them, I said, I don't want to do that. Because I don't -- my thesis will maybe take two or three years to do. And I don't want to waste my time doing a thesis. What I want to do is to work in create, in preparing for my creation of my company. Based on my invention. So I have to prove that you can boil off, make electricity by boiling of electrons.

One of them -- and I can give you all their names in a short while -- the head of the department, one of them was professor Kaye. He took me to the head of the department. And I said to the head of the department, I want to do my thesis in proving my invention works. So they both said, it's fine, you can do that. Except that, who's going to pay for your experiments? Do you have any money? I said no, we don't, I don't have any money. He said well, there's nothing that we can do about it. But we suggest, why don't you -- this sounds intriguing idea. Maybe the space agency could help you. Maybe the Atomic Energy Commission could help you. Maybe the Department of Defense can help you. So we'll set up appointments for you to go to Washington and try to sell them the idea, to finance this idea of yours. So you can do your thesis.

I went to all three, with the appointments they had, professor Den Hartog and Professor Kaye had arranged. Okay? And they kicked me out. They said, this is the craziest thing we ever heard. Boiling off electrons. Are you kidding? Get out of here. We're not going to give you a dime.

And when I reported that to Den Hartog he went to the dean. At that time was Dean Soderberg, Richard Soderberg, who got enough intrigued with the thing that he went to President Killian. And they carved out, for the first time -- at least, that's what they told me -- first time in the history of MIT -- all the R and D at MIT was supported by the US government. For the first time, MIT used its own money to support my thesis.

And so that's reason number one. They spent \$50,000 over a period of three -- well, no. I started that in '53. Three, four, five, six -- five. Yeah, about three and a half years. And that was instant money.

And then, and of course they owned the patents. And when I went to Dean Soderberg and said Dean, I'm forming a company -- it was '56 -- called Thermo Electron. And I'd like to buy the patents that MIT has. Because they paid for the thing. You know MIT, even though MIT has the patents of somebody working, a student, but the student has rights, too.

So Dick, Professor Soderberg says to me, I'll talk to the president. Came back a week later and said, we decided to -- all you have to do, you can have the rights, the full rights of the patent, provided you promise, if your business is successful, you endow a professorship. And I said, boy, that's a pretty good deal for me. I did promise. I did endow it, as soon as we started being successful in the company.

And so that's a major -- but that was, I would say, 10 percent of the contribution of that. There were many, many other contributions. Can you imagine, when I tell that to people right now, entrepreneurs, they come out of MIT -- do you know what the Department of Mechanical Engineering did? The assistant department head called me in, by professor Carl Spencer. Called me and he says, George, I understand that you started a company, and you're now an assistant professor here. And you work only weekends in the company, and plus one day. That's what the official. But wouldn't it be easier for you to be connected, your office at your company be connected with the MIT network? So I got an extension, an MIT extension for my office.

Now, when I tell people that now he says, that would never fly here right now. This would be a completely not, a conflict of interest. You know, totally inappropriate. But it was different climate at that time. The help they gave-- MIT had given me was enormous.

Final help. So, I'm going to tell all that to Susan, in four weeks from now. We got my -- so I got my thesis. MIT called me in, all the deans and so on called me in and says, yeah. Congratulations, you got your PhD, you became an assistant professor. And you got everything, and we gave you the rights. And now you can build your company. But no more money. You have to find your own money.

And I was trying to find angels, to find -- and it was tough going. And what changed the picture dramatically was something that, the following story. And again, I'm getting too verbose. And if you want, I'll stop right here.

INTERVIEWER: I'm very interested in the ways in which MIT helped you.

HATSOPOULOS: Alright. What happened was that professor Den Hartog, head of the department -- or maybe it wasn't him but was Dean Soderberg. I don't know; one of them -- said, we can help you there. Because this invention of yours could very much intrigue General Electric. And for me of course, General Electric meant a lot. Because they didn't know that my ambition was to emulate Thomas Edison. I never told anybody that.

But why don't we invite some people from research labs at General Electric to look at your invention? And tell them that you're looking for funding. And General Electric can fund it; they've done that before, funded.

So they came in. And in fact that was a-- as I found out later from Hayden Library, that was the first time that anybody had, so many people asked so many copies of one thesis. Because they all got copies of my thesis. So I thought, they got that, they went along. I told him that I wanted them to invest. They said we'll call you back.

So that's March. March, April, time goes on. Nothing happens. Not a word. So again, I was trying to get some people to invest in my company. I found a couple of angels to do a little bit of investment. And then, what happened in December of -- December, what year? December. I forget now. 2007 or 2008? 2007. 2007. December 2007. Sorry.

Somebody calls me up and says, read the *New York Times*, the business part, that section. And there's an ad. General Electric invents a new way of generating power by boiling off electrons. A prominent engineer, General Electric's lab called Dr. Volney Wilson invented that. And so on and so forth. I take that and go to Den Hartog. And together and went to the dean, Soderberg. And they got, they exploded. Because they knew all this history. They knew I had come, and they saw what I was doing --

INTERVIEWER: Forty years earlier.

HATSOPOULOS: And so, they start talking about, should we sue General Electric? And then they said, no, no. We shouldn't do that. We'll -- don't worry, George. Forget it. We'll take care of it. And they did a fantastic PR campaign about my invention. I have a whole book that big. All over the world. And that was publicized worldwide. In *London Times*, *Paris* [INAUDIBLE], it appeared in Russian newspaper, it appeared everywhere. In the United States, all over the place.

And MIT invents a way by boiling off electrons. By the way, *London Times*, footnote to that. I'll show you the, I still have the clipping. Footnote. General Electric, a few months earlier, General Electric claimed to have invented that. And says, that's the end of it. Didn't elaborate more.

Guess what? I get mail, piles of mail, from all who wanted to invest in my company. When I tell that to a new entrepreneur has an investment, they can't believe it, that anybody can be so lucky. And on top of it, two of the top notch venture capitalists in the country at that time -- who were Lawrence Rockefeller and General Doriot-- have you ever heard of General Doriot?-- Wanted to be the principal investors. I told him that I had to decide between the two of them. And the investors start trying to convince me to take their money. To give you an idea, General Doriot invited us at his house in -- both Lawrence Rockefeller invited us to his house outside New York, and General Doriot invited -- I was married at that time -- invited me and my wife to their house in Beacon Hill. And in fact there was, they had a whole chamber orchestra.

Can you imagine? When I tell that to entrepreneurs, that two principles were trying hard to get, to convince me to take their money. They can't believe that. How lucky can anybody be?

And I haven't ended the thing, and I'm not going to end it. Because I can go all night. But the kind of people, all the people that really took the culture, adopted the culture and believed in it. Like, some analyst in Wall Street said to me at one time? Thermo Electron is not a company, a group of people in entrepreneurship. It's a cult. It's a cult. It's like -- which it was, you know. All these MIT people that came to it, they believed in what we were doing. They believed in the whole idea of serving society by finding ways to solve problems.

Not to get Nobel laureates. That's all for -- that's looked down upon. Only physicists want to look. Engineers are different. Engineers want to build that, to do some results. And getting a Nobel is not a worthwhile objective.

INTERVIEWER: Is it MIT's support over the years that is responsible for you being on the Corporation? Is this sort of a way to give back?

HATSOPOULOS: Well, you know, I became very well known among the members of the Corporation. So when I -- I was senior lecturer for many years. And when I retired as senior lecturer I taught -- I retired as an associate professor in 1961. I was appointed senior lecturer. And in fact I was told -- now, I'm glad to have that written, because I was told that was the first time that they came up with the title senior lecturer. Until then, MIT had the title "lecturer." But they didn't want me to leave, so they invented the title senior lecturer, which is more or less equivalent to a full professor, but part time. So provided that I would teach at least one course, and also supervise theses, which I did. And I did that for 22 years.

But after I retired as senior lecturer, MIT came up with the idea to put me on the board of trustees.

INTERVIEWER: When -- what is it that -- you kept up the teaching for 20 years. What is it that you got out of that experience that kept you wanting to do it?

HATSOPOULOS: That's a very good question. What is it that I got out of that experience of teaching that I wanted to do it? I did get a lot of it. But that's not why I wanted to do it. The only reason I wanted to teach is because I, that's fun for me. And my board kept asking me that same question you're asking. George, you're working very hard. The company's doing very well, and you're working very hard. Why on top of it, you have to teach at MIT?

Especially since, by the way, they paid me to teach at MIT, and every year I would donate all that pay back to MIT. It wasn't part of the deal, it was just, why I did it. So he said, I said, why, what should I do?

Alright, so you, you're working 50 hours a week. Forty, fifty hours a week, which was roughly what I was working. Why, on top of it, on average, you teach several hours a week? I said, why shouldn't I? He said, well because you should, if you work 50 hours a week, you have to relax. I said, what do you do? You have to have fun.

I said all right, what do you do to have fun? He says -- that's several members of the board I asked specific. He says, we play golf. I said, well I teach. That's my goal. I don't like golf. You see, that's my problem. But I like teaching. I have fun teaching. And really, I really mean that.

I mean, I didn't do it because I'm getting something out, although I -- you always get something out. You learn a subject more by teaching it than anything else. There's no other way, more effective way of learning than teaching something. Especially if you teach very brilliant kids that ask the most unheard of questions that floor you, that you don't know. And you would say, just a moment. I don't know the answer. I'll answer you next week. They forget. I would see the student in the corridor and say, well, I've got your answer. He says, you still remember that? I say of course. You asked me the question, I had to find the answer. Look, I-- that's how you learn.

But that's not why I did it. I did not do it because it was useful. I did it because it was fun. And it's a different objective. Playing golf or playing bridge is not useful. It is somewhat useful; playing golf you exercise a little bit, and playing bridge, you exercise your brain a little bit. So there's some usefulness there. But primarily you do it because you have fun, you have fun. And that's why I did the teaching.

INTERVIEWER: I want to go back for a minute to the structure of Thermo. Because as I understand it, your plan, about bringing lots of smart people together and having them solve societal problems, that as that developed, you spun off these individual companies and retained 50 percent ownership of each one. Can you just talk a little bit about why you approached the business that way, and what the philosophy was in setting it up that way?

HATSOPOULOS: Well, there were -- first of all, there are the following alternatives. You start a new business. You can maintain it as a division. That's one alternative. A wholly owned division. You make it in a company which you can have it as a, incorporated as a private company. Or you incorporate it as a company, and you take it public, and maintain more than 50 percent. Or, the final fourth alternative, to sell it off completely. Okay.

Now what are the -- there are many pluses and minuses. The first one is not a good model. Because you're not going to attract -- people that have brilliance and imagination and drive want to create their own thing. Being the head of a division of another company doesn't satisfy them.

So I would not have gotten all these ideas from people that could very well -- they work in Thermo, they're very bright. They got an idea. And as we've seen, and that happens to many companies. They got an idea, and go and find some business and start a company. Why don't they start the idea in their own company? Because they want their own thing.

So the idea that -- I say, you stay here as a division. And as soon as you -- I promise you, as soon as you're reasonably independent, I'll make you a new company. We'd either take you public, but we make you an independent company. That was key to motivating these people, you see.

Now, why not sell it? As a matter of fact, part of the deal, and many times it was the people that requested that. We'll do that, and we love that. But you have to promise not to sell us. Because we don't want to be in a different environment. We love this environment. We want to do our own thing and to be our own boss. But we like the environment.

Now that was the negative. Why I didn't -- you see, and I don't know how I would do it in my next life, when I -- there's no next life, of course. But nevertheless, if I had to do it again. Because we had too many --

By the way, we didn't call them spinoffs. The word spinoff is when you separate completely. We called them spinouts. We didn't invent that word. That word was invented, I don't remember which year, but I think it must have been sometime in the early '90s by a reporter in *The Wall Street Journal* that described the structure, the unusual structure of Thermo Electron. And they said, this is, all these other companies call, if something comes out of them independent, they call it a spinoff. And of course they get rid of it, they sell it, or they give it to the stockholders. Thermo Electron is retained it as part of the family. Becomes an extended family. So the proper word he coined was spinout, not spinoff. So just a linguistic detail.

Anyway, does that answer your question?

INTERVIEWER: Yes. And now I want to know, as -- that model worked well for a long time. And then it got to a point where it didn't work well anymore. Do you have a sense for why that was? What was the, what changed?

HATSOPOULOS: Well first of all, most of the people have the idea that the model didn't work towards the end, primarily because after 12 years of cost rise in Thermo's stock prices, Thermo stock price took a dip. I think that -- and then of course, soon after that I retired. Okay? So your -- the world agrees with you as to why things didn't go well. It doesn't agree with me.

This thing that happened with the stock price was -- and I knew it -- was completely, had nothing to do with the structure of Thermo Electric. It had to do with the fad in Wall Street. Wall Street goes through fads. That happened to me back in early '71, and it happened to me again back in '82. And it happened in '98.

What's the fad? See, Wall Street, over -- these fads last about 10 or 15 years, roughly. Sometimes they're getting -- Wall Street gets enchanted with having, sponsoring a company that has a generic ability to create new ventures. Has the technological know-how to create new ventures. Regardless of where. They say, they have know-how. They can apply it to medical products, and to this and to this and that. And this, give a premium price.

And then, after 10 or 15 years, the pure play concept creeps in. Wall Street likes only pure plays. It doesn't like companies that deal with various outputs. Okay? What happened at Thermo Electron, we hit a predictable -- and I knew it, fully aware that we hit a temporary phenomena of, they didn't like this complex structure. Which, by the way, three years earlier they thought was the greatest thing since -- So.

Nothing -- so, we've done it before. It happened in the '70s, it happened in the '80s. So it happened again, so we're going to -- another two or three years, it'd be over. There's no problem.

But there was a problem, but having nothing to do with the structure. First of all, I got cancer. And second, I got old. Now the cancer was, I had prostate cancer. And after a lot of deliberation with my wife, we finally removed it. We didn't know if it was going to work. Fortunately it worked beautifully. And that's been 12 years since, and there's no sign, everything worked all right. But it did affect that year. And combined with my age and my wife's insistence that, well, you can't go on forever. So basically, it was not the -- I don't think that I ever considered -- this was a fluctuation of the market that, I knew it would happen. And it would, I knew it would pass. If I, probably if I didn't have the cancer that disrupted me and affected my wife as well, I probably would have continued another four or five years. Because I did pretty well -- as it turned out, I was fine after a while. In fact so fine that I started a new company. And went back to work full speed.

So there was nothing with the structure. I'm continuing my ideas to replicate the same structure. And it'll take me a longer time -- long, not longer. Long, long time. I hope it takes me shorter than the 50 years it took me for Thermo Electron. But maybe -- I don't know. Maybe. It doesn't matter. It's not the end. You know, a Chinese -- and I can't tell you who it was -- a Chinese philosopher said when you set yourself to go to somewhere and mount your mule, your donkey, don't keep looking at your product. Just look around and enjoy the ride. It's -- see, it's true that it's useful to have, to set a certain direction you want to go. After you set the direction, don't focus on your goal. Focus on enjoying the ride. And the ride can be very enjoyable.

My objective is, if I can achieve being, life being 80 percent fun and 20 percent hard, unpleasant work, then I've achieved my goal. That's my goal: 80 percent fun. And I've achieved it over time many times. Not in the '90s. I tell you, the late '90s, I didn't achieve that. But now I'm achieving it. And I achieved it in the past.

INTERVIEWER: Well, I have many questions that we didn't get to, but we're just about at 4 o'clock. So I guess the last question I want to ask you is, what that we haven't talked about do you think is important to speak to before we end? We didn't really talk about Pharos or --

HATSOPOULOS: Well, we didn't talk about Pharos, but it's not important for me to talk about. All I can tell you about my new company is I'm trying to continue what I did in the past. And there's nothing different. Same idea. And it only confirms that what I did at Thermo Electron was part of my makeup. That's what I want to do. And I'm doing it. And the only assurance that I will continue to do as long as I live is as long as I have 80 percent fun.

Now what we didn't talk about, well of course there are a lot of things we didn't. First of all the details we didn't talk about. We didn't talk about the support my family has given me. It was very important so far, support my family has given me. Well I was -- and by the way, all these people that, all these professors, cousins of my father and my mother and so on that were very critical that I went to the United States. They were even more critical that instead of continuing a scientific career or an engineering career, I did business. Even though that is, eventually they accepted me.

INTERVIEWER: Do you think that part of the success that you've had is because you did make it a point to study the business side? And that you aren't just an electrical engineer who started a company?

HATSOPOULOS: First of all, I'm not an electrical engineer, I'm a mechanical engineer.

INTERVIEWER: Mechanical engineer. Sorry.

HATSOPOULOS: But frankly, honestly, I am an electrical engineer, too. I mean, I could very easily qualify for an electrical engineer. More easily than -- Why did, my degree's in mechanical engineering, it's another story. It's due to having to do with my draft and so on and so forth. There are many stories. But anyway.

So your question was, what was it?

INTERVIEWER: It's, it's how important -- you made it a point to look into the business side when you were very young. And I'm wondering how important you think that was to being a successful scientist.

HATSOPOULOS: I tell you, very important. But I didn't do it because people told me, if you want to be a successful businessman, you have to learn all the many things. You have to go business school, Sloan or Harvard and so on.

Actually, I've done much better than going to the schools. Because I kept asking myself, I want to create a company. It occurred to me -- I remember one of the first times I hired someone, an engineer from MIT. I gave him a job to do. It was very small, it must have been 25 people altogether. We brought our first engineer, he didn't even have a PhD. He had a Master's, I don't remember what department. Well, of course it was Mechanical Engineering

Anyway, I gave him a job. And I asked him to analyze what should be done. And he started explaining to me. I disagreed with his analysis. And my first reaction is to tell him you're full of baloney. But then I stopped. And I said, my mind. Why am I doing this? I'm trying to develop that person. And the only way I can build a company is develop people like that. So let's go slowly. Let's not tell him that you're wrong. Let's call around the corner and ask a few questions here and a few questions there.

And I did it. And he saw what was wrong with his thing himself. And he was very happy. So I said, gee, you know. That's my job. My job is, if I want to create a company like that, my job is to develop people. You don't have to learn that in a business school. It's common sense.

A CEO of a new enterprise is not -- should forget he's an engineer. That should play -- in fact, that is a burden. Being an engineer is a burden. It leads, could lead to catastrophe. Because as long as it doesn't -- you don't control the desire of engineer to say, well this is, should be done this way, and so on. The purpose of a CEO is to develop people.

INTERVIEWER: A lot of people don't know that.

HATSOPOULOS: I know. Isn't that odd? Very few people.

So if you were to give me a prize, and ask me -- a major prize -- what should I -- you think you deserve a prize? I think I deserve a prize, not -- even though I've done some, I've gotten many prizes in engineering. I'll give you a list of all the prizes. None of them really reflect what I think that I deserve more. I deserve to understand what it takes to build an enterprise. And what it takes is a group of people. So it's-- you develop people.

And how do you learn how to develop people? By only, keep asking yourself, how would somebody influence me? The only advantage that I have about being an engineer is that, since I'm trying to develop engineers and I'm an engineer, I know what will, the tricks I have to use to influence an engineer, you see? Certainly not go up against him. Because you'll make an enemy of him. So that's the advantage.

Look, I think that I recognized that -- you know, I'm not perfect all the time. Sometimes I get carried away, and I may start arguing. I mean, I've lost some very fine employees because I failed to recognize that my job is not to argue with them and prove them they were wrong. My job is to get them motivated.