

**Adobe Systems – The Founders Perspective**  
**November 12, 2002**  
**Computer History Museum**

**Bernard Peuto:** It is with great pleasure that I'm going to shortly introduce Chuck Geschke and John Warnock. As you know, they are the founders of Adobe. Adobe is a company that is twenty-one years of age soon, since it was founded in late '82. And basically they don't need very much of an introduction, but I will try for two seconds. And the thing that is so unique about Adobe is that they represent the ultimate dream of a startup. They did change the world. They basically are touching every one of us; every one of us is using one of their product and they revolutionized the publishing industry which is not a small feat. Chuck was born in Ohio. He got a PhD in 1972 for CMU and he joined Xerox Park in the early '70s. An important date was in '78, he formed the Image Science Laboratory where it happened John joined him. And he left to form Adobe in 1982 and then the rest is history from that viewpoint. John was born in Utah. He got a PhD in 1969 from University of Utah. He worked with Evans and Sutherland among a few companies before joining this Image Science Research Lab with John where they became partners for life, and then they founded Adobe together. And now it's their turn to talk. Thank you very much.

**Charles Geschke:** Well, thank you Bernard, and thank you to the museum and John and the folks here who've given us an opportunity to spend some time with you this evening.

It's sort of amazing. As I was walking into the museum tonight, I happened to run into Dick Sweet and I reminded him that it was exactly thirty years ago that he and I first met in the halls at Xerox Park. Part of me says that wasn't such a long time ago, but when you put the number thirty in front of years, that is in fact a long, long time ago.

John and I are going to do this in tandem. We're going to do a tag team event here. If you get confused about which of us is which, I'm the one with the beard, so just make sure you remember that. We're going to talk about three things. We're going to talk about starting a company. Now, given that the company is twenty years old, we could bore you to tears with several hours of descriptions of all the war stories that go on, but what we're trying to do is focus on a few things that we think were critical that gave us an opportunity to not only start a company, but to lead it to the stage that it's at today twenty years later, and part of that is understanding the context and the environment when we began.

Then John will focus on a little bit of the very early history of the first few months of Adobe, and some of the decisions that we made and personalities that were involved in the process of getting our company started. Then he will talk about the philosophy of innovation that was so critical, we believe, to the success of our company in terms of taking on the challenges of starting products in markets that are not yet well defined or well understood or even appreciated.

And then I'm going to come back and talk a little bit about the establishment of a company's culture because one of the things that we felt was really critical about Adobe when we looked at role models here in Silicon Valley, particularly a company like Hewlett-Packard, was to establish a set of principles and a culture that could allow the organization to sustain its growth and maintain its personality over the years.

So let me begin by setting the context. You don’t start a company in a vacuum. You start it in the environment and the set of principles that you have discovered in the process of your career. You look at examples of good management structure, you look at examples of good high-quality product development strategies, you look at people who are experienced in sales and marketing, and you take all the experiences you have and you try to put them together. If you look back to the late 1970s, one of the things that was absolutely imperative at Xerox that was so important to the way we began to think about computing was that everybody should have his own computer. That’s really where the concept of personal computer was made real for the first time. And secondly, that a computer is not primarily used to calculate; it’s used to communicate. And that was really a difference. If you think back to the ‘60s and the ‘70s and you look at a lot of the artifacts here in this museum, except for a few exceptional places like the University of Utah and some of the research work being done at SRI where computers were really thought about more in the context of communication, a lot of the investment and development across the industry was focused around computers to calculate. And you all remember those IBM ads where they really talked about how many pennies it takes to do a million multiplications, and that they were bringing down the cost of computing, but it was focused around calculation.

The other thing that became very important to the environment at Xerox Park was that not every computer had to have its own printer. It wasn’t like the old days where you bought a computer and you put a line printer on it. In fact, a computer was something that you could share. You could share file servers, you could share a whole variety of different things, but a printer was something to be shared. It was something to be out there on the network which also, in many cases, I think we would attribute to the emergence of Ethernet as the practical implementation of networking for the first time in the industry. And that primarily was first used to share printers. The whole idea was to take a sixty-page a minute gorilla of a machine that you would never want to have in your office but be able to walk down the hall and pick up a document just a few moments after you asked it to print.

You put all those ingredients together and it began to build an environment in which you began to think about the problems associated with personal computers and networking and printing, and those things began to crystallize in our minds as issues that had to be dealt with. And then a sort of watershed event occurred inside of Xerox, and that was a conference down in Boca Raton where for the first time we showed to Xerox management all the things we had been working on for the past seven years at Xerox Park. And that was a very interesting lesson for all of us who were researchers, because we, for the first time, we began to appreciate that we understood our environment, but we were having a great deal of difficulty explaining it to the rest of the business world and in particular the management of Xerox as a corporation. And I remember coming back from that meeting and not too long after being told that I would have the opportunity to start a new laboratory. And I said to myself, “God, this is going to be hard because we have some things we need to do, but how will we ever find a way to get these products out into the market?” Nonetheless, given the opportunity to start a new laboratory, it was hard to say no, and so I had the great opportunity to do that under the leadership of Bob Spinrad who’s here this evening and to put together a new laboratory focused on imaging and printing and graphics.

And the first thing I actually said is, “I have to have a chief scientist.” I’d known about John by reputation and frankly probably my best hiring decision ever was to hire John to come and be part of ISL which he graciously said “Yes” to. And he began working on a whole variety of things associated with graphics. But before too long, we found ourselves sitting just down the street from where the development of the Star work station was happening inside of Xerox and much like everyone else in the computer industry, they realized that in order to be successful with that product, particularly for Xerox that had a history of

putting marks on paper, they had to have a printing solution. And they were within about a year of shipping the product and they didn’t have a solution. You’re going to hear this story come back in a few minutes from John in another context. And so they came to the laboratory, and they talked to John and me and they said, “What can we do?” And we said, “Well, we have some ideas,” ‘cause really some seminal ideas had been done early on by Bob Sproull around a press architecture for the second generation of Xerox printing. We thought there were some ideas that could be put together, and we put together a team of people; Brian Reed, Butler Lampson, Bob Sproull, Bob Ayers, John, myself, and who am I forgetting, John?

**John Warnock:** Gerry Mendelsohn.

**Charles Geschke:** And Gerry Mendelsohn. We began the process of designing a way to share printers and to do it in a device independent way. That evolved into something that eventually became InterPress. And InterPress was in fact for us as a young laboratory a great success inside Xerox because, as we explained it to the management of the company, they said, “That’s a great idea. We should make it a standard within the company.” And then I learned the next big lesson in management, and that is it’s not enough to sell inside; you’ve got to convince the company that they want to sell it outside. And so we immediately said after they standardized on it, “Let’s begin to market it,” and that’s where we began to run into difficulties. And out of frustration with the inability to be able to get that technology out into the market, at least as rapidly as we thought it had to get out, because we knew if we had these ideas, there were a bunch of the rest of you out there who were probably having similar ideas and similar technology thoughts.

I’ll never forget the day John walks into my office very frustrated and very deliberately shuts the door behind him – we always had pretty much an open office environment – and he sits down across from me and he says, “We have to talk.” I thought, “Oh, God. What’s he going to talk about?” He said, “You know, either you or I can get very old and frustrated, or we can take our ideas and figure out how to get them out into the world.” And as I sat there and talked to him about it and began to realize what the potential was, obviously I became excited, but at the same time it dawned on me that in order to be successful, any idea like this had to get out into the marketplace and it had to get out there as quickly as one could get that technology to market. And so it became imperative for us to find an environment in which to do that.

And now, John, I’m tagging you to talk about how that went in the first few months. ‘Cause now it looks like it was simple and easy, but it wasn’t then.

**John Warnock:** Thank you. Well, I said, “You have to do something concrete. You can’t sit on your hands all your life.” So I said, “I’m going to call my old thesis advisor, Dave Evans, and actually buy my own airplane ticket and go up and visit him.” And I did that. And he said, “Gee, yeah, you ought to start your own company.” And he offered to introduce us to Bill Hambrecht. And Bill Hambrecht was the original funder of Adobe Systems. When we met with Bill Hambrecht, we also found that he invested in people. He really didn’t invest in ideas, he invested in people. Chuck and I had pretty good reputations at that point, and this is a lesson to the current VC community. It’s really not the business plan, it’s really not the idea; it’s the people that you invest in. And sometimes VCs lose their way and forget that.

We got funding from Hambrecht and Quist. Our business plan changed three times before we actually started. The first business plan, we were actually just going to build some printers and open up service organizations, so that people could bring

things in to be printed. We thought that might work. Bill Hambrecht said, “No, you’re not going to do that.” He hired us a consultant, and the second business plan was very much like about six other startups at that time. That was to build laser printers, put them together with computer workstations, and build publishing systems. So there was ViewTech, TechSet, Interleaf, ZyVision, Qbix. Can you remember any more? There were a whole slew of startups at that point that were going after the large industrial publishing companies like Boeing. Boeing does an enormous amount of publishing. IBM does an enormous amount of publishing. Laser printers were pretty new on the scene. They cost about thirteen thousand dollars for the very cheapest laser printer that you could buy.

Sun Microsystems was just starting so we were buying Sun Microsystems to build publishing platforms. Interleaf sort of had a head start. We started down this route and I got a call one day and on the other end of the phone it said, “Hi, this is Steve Jobs. I’ve heard that you guys left Park and that you’re really good and I’d like to come and talk with you.” And I said, “Happy to have you come over and talk.” And so Steve came over, and he saw what we were doing. We started with the printer-part of the problem. We started actually making a printer protocol so that we could put anything on a page, and this was called PostScript. And so we showed him the early parts of PostScript. Steve then showed us the Macintosh, and this was a year before the Macintosh was announced. And he said, “The problem that I have is the Macintosh is wonderful graphic interface, but the only printer we have is an ImageWriter that prints at seventy-two dots per inch and the ImageWriter is never going to fly in a business environment. And he saw PostScript and he said, “This is a match made in heaven.” He said, “Don’t go build workstations, don’t go build printers. Focus on the printer protocol to actually drive the printers, and Apple can be your first customer.” And we said, “Well, but the Macintosh is too small of a computer to really drive a printer successfully.” And he said, “That’s all right. We’ll build a computer and put it in the printer.” So Bob Belleville and the engineering team at Apple and our engineering team got together and built the first controller boards. And the first Laser Writer was the largest computer that Apple had ever built. So the sequence of events was really very interesting. Later that summer, after we had talked about this a lot, he offered to buy Adobe for five million dollars, and we said, “No, we just left Xerox. We don’t want to sell Adobe quite yet. We’ll sort of take our chances.” In the fall of 1983, we signed the LaserWriter contract, and Apple at that point invested two million?

**Charles Geschke:** Two and a half.

**John Warnock:** Two-and-a-half million dollars into the company and gave us a contract and an advance on royalties on the PostScript printers. Now, you have to understand the state of computing at this time. Macintosh got announced in January of 1984 and sort of had this run around, and we were going to announce the LaserWriter in January of 1985. So we were working very, very hard at Adobe to build an onboard computer inside of the LaserWriter, and we were going to blow a half a megabyte of massed ROM. And, I think that was, outside of the space program, the largest amount of code that had ever been put into massed ROM, and so it had to be bug-free. So we tested and tested and worked and worked to build the LaserWriter board through all of 1984. It turned out that the cost of the LaserWriter when you included RAM and ROM and the Canon laser printer was about seven thousand dollars, and this was coming into January, and they planning on selling it for seven thousand dollars. They were going to sell it at no profit, no potential profit. The marketing organization at Apple went ballistic. They said, “This is the craziest thing that Apple has ever done in its entire career. We cannot sell a printer that costs three times what the computer does and has no margin in it.” And so Apple had this conference down in Pajaro Dunes where the marketing organization got together along with Steve, and Steve said, “Guess what? I want the laser printer. The laser printer is going to happen. I don’t care about the rest of you guys. It is going to happen.” And so he made the decision two

weeks before the LaserWriter shipped, the price of RAM dropped by a factor of two which made the cost of the LaserWriter drop essentially by about a third or something which put margin back into the machine and the LaserWriter was announced.

I think that a lot of people will agree that the LaserWriter was what helped Apple succeed through the early years and toughness because desktop publishing took hold later that year and really generated a whole new industry. Now, from a marketing perspective, when you look back at this, there was no market for this thing. You would not be able to define a market. There was no category that it was going into. There was no such thing as a printer description language. When we went and talked with Jonathan Seybold, he said, “That’s very curious technology, very interesting. So what?” And I remember early, before the Laser Writer was announced, we had Jonathan Seybold come in to meet with Steve, Chuck and me. We showed him the LaserWriter and he said, “Oh, damn it. Why didn’t I see this thing coming?” He said, “I completely understand now what the role of the LaserWriter is, what it is going to do to the publishing industry,” and he didn’t see it coming.

We worked very hard because we knew that we could not be successful with Apple just by itself. We knew that, if you could not produce high quality typeset output, you would only have a part of the solution. So we contacted Compugraphic and Linotype and all of the typesetter companies and most of them said, “No, no, no, no, no, go away. We know how to do that. You don’t know how to do that,” except for Linotype. Linotype had a very forward-looking head of engineering who said, “Gee, this is a way for us to do full graphics on a typesetting class machine and be able to produce equivalent, you know, the highest quality output of any typesetter, and it’s sort of compatible with this very low-end workstation.” After we got Linotype, and after we got Apple, OEMs started to appear and we would sign more and more. We got IBM and then we got Hewlett-Packard. And through this process, PostScript started to become a standard.

Adobe, through the ’86, ’87 timeframe, was an extremely successful company that was growing at a very great rate, over a hundred percent per year. We made business, we topped the Best Small One Hundred companies list, and the company was growing like a fiend. The secret of that success was the fact that we really approached the printer problem differently than everybody else. Rather than thinking of type as a bunch of bitmap characters, we thought of type as graphics. And it’s just a special case of graphics. By taking that approach, we really were able to solve problems that no other typesetters or image setters at that time could solve. We could rotate type, we could scale type, we could deal with type in ways that nobody else could. So Adobe was off to the races.

We went public in 1986, late ’86 I think. PostScript was growing like a weed, and I thought to myself – Chuck and I would have these conversations – if we were a one product company, we were going to die because eventually the steam would run out of that product and you would die. Now, every single resource in Adobe was on PostScript, so what we said is, “We have to break this. We have to get to work on other things than PostScript.” So we started a group called the Advanced Technology Group, and we forbade anyone in the Advanced Technology Group from working on PostScript. They had to work on other stuff. Our second product was early ’87, late ’86, and that was a product called Adobe Illustrator.

Now, remember back in the old days when Macintoshes were 512K machines with these little itty bitty screens and almost no disc drives on them? The other thing that was true at that time was absolutely no graphic artist on the planet used a computer, and here we were bringing out a product that was to help graphic artists and none of them used computers. Any sensible marketing person would say, “There is no market there. This is the stupidest thing you can possibly do.” We did it anyway,

and over the next three years, graphic artists said, “Gee, the productivity that I am going to get out of using this little computer versus the way I had to do it in the old way is going to change the way that I work.” And that in fact happened.

For the next product, we had two guys come in, the Knoll brothers. The Knoll brothers walked in, and they had this little program, sort of a toy program running on a Macintosh 512K, and it manipulated photographs. And the largest hard drive you could buy at that time was 20 megabytes. Well, anyone knows that a photograph can take all of the 20 megabytes of hard drive that you would potentially have, but this little program called PhotoShop really manipulated images in a very unique way, and had a huge amount of potential. I even thought when we acquired the product that we could sell maybe two hundred copies a month of this program. Well, it turned out that technology and Moore’s Law bailed us out, and now I bought an internal 150 gigabyte hard drive the other day for a hundred and fifty dollars. And my current system, I think, is 750 megabytes, and it’s got this big screen on it, and it does PhotoShop just fine.

PhotoShop has been this incredible tool, and had we thought in the beginning when we bought this product that it would absolutely not only revolutionize professional photography and publishing of images and the whole dealing of imaging in the publishing industry, but it’s also had an enormous effect on consumer imaging and consumer photography and all of the other things. But at the time, with the machine that it was running on, there was no market. There was no demonstrable market or demand from customers for that tool. And so here again, we were betting on a technology and betting on the curve .... betting on the development of computers to fulfill the fantasy.

In 1991, I got this harebrained idea that because PostScript had become a standard, there was this very subtle, cute thing you could do. You could capture the print stream out of almost every application on every personal computer, and you could take that print stream and reconfigure it into a file format that would actually travel across all kinds of computer platforms and all kinds of operating systems and carry not only the typefaces, but the look and feel of the document. And I wrote a memo in 1991 saying, “Gee, there is this idea, and if we pursue this idea, there may be an interesting market for documents that are actually portable.” I had been in the computer business long enough to know that this was one of the holy grails of computing. Getting documents to travel across computers had always been a problem, and there had been a lot of attempts to solve it. We had, because PostScript had become a standard, a finesse that we could pull to make a file format that would actually do this, and that was the founding of Acrobat.

In the early days, I thought, “Everybody is going to get the significance of this product. This is going to fly off the shelves.” It didn’t, but there was no market for it. It was like all the other things. There was no market for it; there was no demand for it, but over the years, as the internet came along, gee, sending documents around the internet really had some value, and Acrobat started to take off in about the ’94, ’95 timeframe. It now is Adobe’s largest product. So over time, this seed of an idea that had no demonstrable market has sort of become over time something that has enormous power and enormous legs on it.

The whole idea behind all of this is that it’s really important in technology not to try to do something essentially for today’s market, but to look a couple of years out and shoot ahead of the duck. If you want to hit the duck, you have to shoot ahead of it, and to do that, you have to see what the trends in computing are and not try to make a better Microsoft Word or Excel or something like that, but look at what the trends are and anticipate. But the more important thing is you have to have the

patience to make new markets. You can’t expect to bring out a market and in two months have the market be a success. It just doesn’t happen that way. People have to change their behavior patterns, people have to change their work habits, people have to change the way that they do things, and they have to get used to the idea that there may be a better mousetrap out there.

I think Adobe’s success over the years has been the fact that we have had staying power in these products. We didn’t abandon them. We didn’t say, “Gee, it’s not profitable, it’s not on the bottom line; it’s out of here.” We said, “Look, this is the way the future is going to be. We are going to stick it out. To hell with the rest of the world. We know that this is where the world is going to go and we’re going to stick with it.” The company is full of incredibly talented engineers who put ideas together. The trick is to recognize the combination of ideas and recognize how that fits a need into the future. And I think that’s what we’ve been good at. But let me turn it back to Chuck and let him talk about the culture. Thank you.

**Charles Geschke:** Neither John nor I are hunters, right? No, so we use this duck hunting analogy, but I don’t want to you get the uncomfortable feeling that we are hunters; we are not, but it’s critical. It’s a lot easier to build a business around a market when you see that there is a gap in what is already there. And if that were the only salient feature of the story, I think in fact it would probably undercut the value that we put into developing and growing our company. The other thing that John and I felt is that we, as I said earlier, had worked in a lot of different places and had observed a lot of different environments, and we wanted to build, based on our experiences, a place that we would like to work, and we would be happy to come into work every day. We felt if we did that, then we could attract the kind of people that John just described; the great engineers, the insightful marketing people, the dedicated kind of salespeople necessary to make the company grow and prosper and be successful.

It’s interesting though that it’s an instinctive thing in terms of how you try to develop the culture of your company, but you don’t really know how important it is or how difficult it is until you start to get into trouble. And in fact, it became sort of a standard thing as we would confront competitive factors, downturns in the economy, and other things when we were frustrated in trying to decide what to do, that we would fall back on the principles that were the inherent culture of the company. And we recognized pretty early on there were four primary constituencies that we had to be concerned about. There were our customers, our employees, our shareholders, obviously, and the community in which we operated.

Now, part of our job as the founders and senior managers of the company was to maintain a balance between all of those constituencies if we were going to be successful, because if you’re over solicitous about any one of them, you in fact will begin to build an organization and a company that’s out of balance. And so we began to talk on a regular basis about what was important about our company, what was critical to distinguish it from other companies in the marketplace? First of all, we’re a company that has always thrived on innovation and that’s why John talked about the things he did. Every one of those products and product categories were really an innovation and were critical in that we are about inventing new technologies as a company. We try not to go where anyone else has already gone and obtained an entrenched position. We try to define new markets, build products. There are no lawyers in the room, so I can say products that dominate in their category. The more polite thing is to say they are leaders in their category, but really products that can get the kind of market share. And when we get into trouble, our philosophy has always been to try and out-invent the competition.

I remember a very painful part of our history back in 1989 when Apple and Microsoft ganged up on us and said, “We’re going to replace PostScript.” Apple was going to throw us out as a vendor, Microsoft was going to take over the business, and they were going to start by putting high-quality topography on the screen. That was announced in September. By March, we were shipping a product and I think in the first quarter shipped several hundred thousand units. It took Microsoft three years to get to that point. And in fact if you had been at the Seybold Conference at which this event occurred, one of the moderators of one of the panels asked a show of response from the audience; who would prefer that Microsoft take over the PostScript business and who would prefer Adobe, and the vote was basically a hundred percent in our favor. I believe part of the reason wasn’t anything other than the fact that people had confidence in our technology and, frankly, liked us as a vendor and as a purveyor of technology in the marketplace.

The other philosophy that we have internally is that we talk about the way that our company should operate in terms of the way it deals with those constituencies. And people will often say, “Well, can we have a sort of codification of the rules that we should use?” And I said, “You know, there’s really only one rule, and that is if you’re confused about how to deal with a fellow employee or a customer or a shareholder or someone out in the community that you’re interfacing with, just treat that individual the way you’d like to be treated, and that’ll be just fine. That will be the Adobe way.” And we’ve tried to instill that philosophy for all of the interactions that we have with these various constituencies ‘cause when you’re in business, your customers in many cases have their business critically dependent on your ability to deliver a quality product on time when you promise it.

Apple really needed to have that LaserWriter in the spring of 1985, and one of the reasons that they made the investment in us and did a prepayment on royalties is they wanted to assure economically that we would be there. But we, on the other hand, as a vendor had to take that issue very seriously because without that product, they would have had a great deal of difficulty getting through that period of time where they were being assailed by the PC in a rather dramatic way because they didn’t have a market differentiation. And in general, whenever we deal with our customers, we try to listen to what their concerns are, but we don’t necessarily go out and ask them what they would like us to do as a next of features in a product for two reasons. Number one is a customer will typically narrow down your vision to the point where you begin to build a product that’s great for that customer, but it doesn’t serve the broader market. And number two, it’s often the case that the customer doesn’t even know what to ask for in terms of what you potentially could deliver. So while we spend a lot of time talking to the customers, what we try to do is deliver to them something that goes way beyond what they actually know how to request, and in that way we give them a product that’s more than they could have possibly thought to ask for.

When it comes to employees, the most critical activity that goes on in the management team at the company and in peer review is the whole process of hiring. We try to hire the very best people wherever we can find them, from whatever background. If you were to travel through the halls of Adobe, you’ll see a great number of people from all over the world that work here in San Jose. Those are the best people that we’ve been able to find. And we try to give them an environment that’s a first class environment in which they can work. I think at one time we were averaging about two and a half computers per employee, and that was because we wanted people to have all the tools in their hands to be able to do their jobs and to do them effectively. And we’ve always been very aggressive in trying to give stock ownership to those employees as well, so that they could participate in both the ownership of the company and the rewards that come from being successful. We’re now in a climate where that’s getting harder and harder to do, and it becomes more and more of a challenge, but we still think it’s very important. We always encourage our managers to praise in public, but only criticize in private. That’s the way you build respect between yourself and an employee. And we advise our employees to work smart, not just long hours. It was very



important to John and me that we maintain a family life. Our children were in their preteen and teenage years when we started the company, and we wanted the ability to maintain a lifestyle in which we could work with them. So we’ve tried to encourage people to be inventive about the way that they manage their time and do that in a way that gives them the time to spend their time at home. And we try to tell every manager in the company that their job is to work themselves out of his or her current position, because in fact the only way you’re successful is to hire people who are smarter than you are and give them the freedom and the support to do their jobs well, and that’s going to sustain your career in terms of growth because you will move up in responsibility based on the success that they achieve.

And finally, in the area of the community: the reason the community is important, frankly, is that it’s important to the employees. The employees want to feel that they work within an organization in the community that’s really responsive to the needs of the community. As you can imagine, early on John and I would just get an avalanche of phone calls, particularly as Adobe became more visible and more successful, about, “Would you support this? Would you do this? We need some help here.” It’s very difficult to deal with that because all of the causes that are being presented to you by and large are very good causes. So we basically advocated our personal responsibility, and we made a decision fairly early on to ask for a volunteer committee of our employees who would be our philanthropy council and let the employees decide where we would invest our resources in terms of community service and community support. And every year, we allocate a certain percentage of our profits to a pool of money that then they distribute on a worldwide basis. I think the thing that I feel most positive about the experience of this last twenty years is that as I’ve traveled around the world, people recognize our products, they recognize the quality of them, and in many cases they take the initiative to walk up to me, and I know they’ve done this to John and to others as well, and say, “Your products made a difference in my life, in my working career, in my creativity.” And that, at the end of the day, is the biggest compliment an engineer can get because every one of us goes into product development and engineering and scientific endeavors in the hopes that we can make an impact in the world. And the ability and the opportunity to do that is the greatest reward you can get as an engineer. And now, Bernard, I’m told that you have a number of very irreverent questions that you’re going to ask us.

**Bernard Peuto:** Yeah, being one of those companies that was mentioned as a failure in the business, I appreciate it because that’s the truth. You took the road that worked, and we take the road that did not work. Before I go to my irreverent question, I have a point that I don’t think you may have emphasized as much as I would have liked. One of the things that has always impressed me in Adobe was the beautiful design associated with their products. One of the reasons I went into computer publishing and desktop publishing was because I thought computers were very dry, but font and types were beautiful. And I think I would like you to comment a little about this sense of beauty that drove you and by the way made this font-war panel that we’re going to talk about in a minute, why people voted for you because you represented beauty.

**John Warnock:** Well, it had been my experience that most computer guys had gotten used to little white letters on green screens or green letters on black screens and five by seven dot-matrix letters. And actually, I have to give the credit to Xerox. They knew that in the world of printing and in the building of laser printers that the typography was important. There’s five hundred years of design and esthetics and tradition that have gone into publishing and you can’t bring new technology and in some sense have an impact on that without having a full appreciation of those esthetics. So I think from the very beginning, we said we have to make the best type, we have to make the most beautiful type, or else we’re not going to be able to have any impact on this market. The people who practice this craft are going to say, “Go away,” unless you can do better than the existing craft can do.

**Charles Geschke:** I grew up in a family in which my grandfather and my father were both letterpress photoengravers, so as a teenager when I’d get a ride home from my dad, I’d stop by and he’d be working on the four-color copper plates and he said, “Ah, the advertising guy wants a little more purple in there so I got to bring up the magenta on this place,” and he’d take a pumice stone and rub the halftone in order to get a little more density on the print. And from those early experiences, I realized that there was, as John just said, literally hundreds of years of tradition of what quality was going to be like. And I remember the first few color prints that we developed where we actually made the plates and the separations, did the color printing, and I’d bring it home to my dad, who at that time was almost ninety, and I said, “Dad, look, color print.” He pulled out his loupe, he always had his loupe with him, and he looked at it and he said, “Well, the rosettes aren’t formed well, Charles.” I said, “Well, thank you, Dad. We’ll get to work on that.”

I remember about three or four years after that where we finally had gotten to the point where we had developed the technology to produce color quality that was as good or better as conventional methods and the first time that he said, “I think you got it.” And to me, that said so much about the achievement of the people who did the engineering and the development at Adobe who had actually gotten up to the quality level that all of this history of using all those awful chemicals and all the processes had actually brought to the world, and it felt like a great achievement.

**Bernard Peuto:** Thank you. We’re going to continue with a few questions, and then we’ll go to the rest of the public. Let’s talk about your company times. And I know any successful company must go through big crises, and in fact they do whether we like it or not. Basically, I’m interested in the font wars and this famous meeting that we alluded to where we were all, including myself in the crowd, at Seybold, and I understand that you managed to turn your back to Bill Gates despite the fact we were on a podium.

**John Warnock:** Yes, it was sort of like this, Bernard.

**Bernard Peuto:** So one of my questions – what was your opinion of Bill Gates at that meeting?

**John Warnock:** Well, let me put a little background in it. One of the secret recipes that we had is that we knew how to make outlined type high quality at low resolutions. And there were some secrets inside of PostScript that did that, and we didn’t publish that as part of the standard. We published everything else, but we didn’t publish the type secrets. The industry got tired of that and Apple got tired of that and so Apple and Microsoft got together and invented this thing called True Type. Actually, it was invented at Apple because I really don’t want to give credit for an invention of anything at Microsoft.

**Charles Geschke:** Now, John, you would give credit if they did invent it.

**John Warnock:** Yes, I would give credit if they did invent it.

**Bernard Peuto:** We’ll come back to Microsoft in a minute.

**John Warnock:** Yes, anyway, so Bill Gates got up and he said, “You know,” he said, “we have come up with this new type technology that is based on parametric quadratics which are far superior to parametric cubics and we’re going to take over the world of type design.” Well, parametric quadratics had been around for a long time. Bitstream used those and a whole lot of type technologies used those, and they said how. Then the other thing Gates said that just drove me nuts, he said, “Two standards are better than one.”

**Bernard Peuto:** As long as Microsoft is one of them.

**John Warnock:** That’s right, yeah. And so he finished with his speech, and I got up and I said, “You know, that’s really the biggest bunch of garbage mumbo jumbo I’ve ever heard in my life.” And we decided at that point that we were just going to out-invent them. We were going to go build ATM and get fonts on the screen at highest quality and resolution before they would. The engineers took that challenge very seriously, and they invented over the next couple of months and delivered that product within about six months. And as Chuck said, it took about three years for Microsoft to come around. Now, to their credit, they had a competitor to PostScript called True Image which was a PostScript clone and Microsoft did ship one commercial product that was a True Image printer.

**Charles Geschke:** And they bought that technology.

**John Warnock:** Yes, they bought that technology.

**Bernard Peuto:** Now continuing on Microsoft, you’re reputed to have said that they have no taste, but basically, I have an interesting question. Knowing Microsoft behavior, how come they never crushed you?

**John Warnock:** Well, in our domain, in the publishing domain and in the world of graphic arts, taste is really important. Design sense is really important. I think the reason designers like Macs is because they’re tastefully designed. The way that the screens are laid out, the way that the interfaces are put together show really incredible industrial taste. And I use PCs. I don’t particularly care for it. I have Macintoshes and whenever I have a chance, I use a Macintosh. I particularly think that Macintosh is much nicer, more nicely designed and exhibits a great deal more taste in user interface design. And I think in our community, in the publishing community, taste is very, very important.

**Bernard Peuto:** I’m going to ask you a last question and then we’ll go to the public and maybe I’ll intersperse some other questions. You know, one of the things that strikes me is you make a very great story about being ahead of the curve and shooting for where the market doesn’t exist yet, but Acrobat, which is clearly one of your greatest success, took between four and five years before it was successful. And so this is not a critical question, more of a management question, how can you distinguish between ultimate success and being wrong?

**John Warnock:** Well, I attribute it to pigheadedness. We would have constant board-of-directors meetings and executive staff meetings where people would say, “Gee, shouldn’t we kill Acrobat? It’s not pulling its weight.” And Chuck and I would

discuss this, and we always agreed no, we’re not going to do that. They wanted us to kill the application division as well, so Illustrator, PhotoShop, all the things that are most of our business now, they wanted to kill. They said, “Gee, you know, you’ve had four years and this is still in the red.”

**Charles Geschke:** You have to remember back in 1986, PostScript was a hundred percent of our business and there’s this phenomenon that occurs where when you have such a dominant product, it becomes a black hole that sucks in every resource in the company. And the critical job that senior management has to do is recognize that even though something’s a hundred percent today, it in fact will become a less important factor in the future, and so you’ve got to find a way to protect the resources so other things can get some investment. And that’s pigheadedness, taste, a little bit of luck, and we did do a few things that didn’t work out.

**John Warnock:** Yeah.

**Bernard Peuto:** Like?

**Charles Geschke:** We bought a product called True Form that was one of my favorites that just went nowhere. It wasn’t in our market. It wasn’t part of our business.

**Audience Member #1:** You mentioned this very true fact that graphic designers never touched computers and you had to change their lifestyle. So who was the first graphic designer who did it, and they’re going to have to wait until one of their colleagues knows it, so how did you solve this major cultural problem?

**John Warnock:** Actually, when we did Illustrator, we actually tested it on a couple of small clients and got them to try it and one of the early ones was Nigel Holmes who did the illustration for Time Magazine. And it took him a while to switch over, but he saw the benefit. The trick is my wife was a graphic designer, and she used to come to me and she’d say, “I need this logo.” And neither one of us were particularly good at inking, okay? Inking is the process of taking a technical pen and drawing a wonderfully smooth curve, then going over the imperfections that you make with whiteout, and then going over it again and again and taking tracing paper and going over it again and again and finally getting a master that you can take to a photographer to do. And in the early days of PostScript, she would bring me a logo, and I would hand program it in PostScript. I would move the control points and do the control curves. And in that process, I discovered that if we just mimicked what the Bezier control points did in Illustrator, you could give handles so that people could actually control the curves. Now it turns out that I was the only one who could use the product initially, but people have this incredible talent for learning stuff and so in the very first Illustrator, we actually had a videotape where I did a live demo. And people got the feeling that if they tried this they could do it, and it would save them enormous hassle over the traditional ways. I think people got onto it and they experimented, and there are always these early adopters who make the market.

**Charles Geschke:** It’s interesting that actually the majority of the market for a product like Illustrator is in fact new people coming into design who were not trained by many of the conventional methods. And so, if you look at the marketplace of graphic designers, it grew by a factor of ten?

**John Warnock:** No. The first days of Seybold, the graphic design market was maybe two hundred and fifty thousand people in the United States, something like that, and now it’s like six million. So the number of people who can carry out the activity – who didn’t have the drafting skills – just grew because the tools are much easier to use.

**Audience Member #1:** Okay, well that’s a good answer, but it’s not the one I expected, because when I had my experience at Adobe, it was because Illustrator ’88 had come by then, and there was a two-day thing where you had arranged to have twenty of the top graphic designers in the whole country come, and each one got a Macintosh. Most of them had never seen a computer before, and each one was given a Macintosh and a personal consultant.

**John Warnock:** Russell Brown.

**Audience Member #1:** But no, I mean there were many staff people in that room, and these people had a two-day session, you know, where each one would be able to do his thing with the computer just the way he wanted. And these were the absolute best – I mean you mentioned Time Magazine – all the great graphic designers in the world. And then they had, you know, a banquet and a competition for who could design the best menu. And this wasn’t the first time it had been done. It was kind of an annual thing as I understood. And I remember that IBM did a similar thing, you know, in the ’50s. They would take the CEO of US Steel and give him a 704 for a day. And I guess that was the answer I was expecting.

**John Warnock:** Well no, and that answer also is true. We had this secret weapon called Russell Brown, and Russell Brown would have these design conferences, but he did it initially with Illustrator, but then he would do it with PhotoShop. He did it with all of the design tools where you would bring people who were fairly reticent. And some of the illustrators that he brought had worked with a pencil all of their lives and pens all of their lives – this was their tool, and all their neurons were trained to use this tool. And he would talk them into trying something else. I remember Chuck and I went up to a photo session in San Francisco to this incredible photographer, and we asked him if he used PhotoShop. And he was almost rude.

**Charles Geschke:** He was offended.

**John Warnock:** He was offended that we would ask him if he used PhotoShop because he was a superb photographer who had really mastered the craft. And I said to him, “Howard, you really ought to try it because you might find that you like this.” And so I got Russell to call Howard, and he went up and visited him and got him started with PhotoShop. Now everything Howard touches is done with PhotoShop, I mean absolutely everything. And every year he calls me for a free copy. He sends me his latest photography book; I send him a copy of PhotoShop.

**Charles Geschke:** It’s a good deal.

**Bernard Peuto:** We have a question here. Yes?

**Audience Member #2:** One’s a bit of a warm-up question which is what’s the origin of the name PostScript itself coming after InterPress, and it leads towards a question where you might have skated ahead of the puck by at least a decade, if not more, and I’m curious about your perspective on the story of Display PostScript.

**John Warnock:** Well, PostScript, if you know anything about the programming language itself, it’s in a postfix notation and that means that the verb follows the upper end. So PostScript.

**Charles Geschke:** Why does that make it PostScript?

**John Warnock:** Well, I just said that’s the only thing – that postfix notation – so PostScript, it seemed like a natural name. So that’s where that name came from. We made it up one day and it stuck. It turns out I’m told by the Japanese that they love the language because it’s very much like the structure of Japanese, so what a deal. Take it where you can get it.

**Charles Geschke:** You have a second question.

**Audience Member #2:** Display PostScript?

**Charles Geschke:** Oh, Display PostScript. Well, you know, it’s interesting. Can I tell the story?

**John Warnock:** Sure.

**Charles Geschke:** Okay. So when we did the deal with Apple, Steve Jobs was adamant that he wanted the same imaging model both in the printer and on the screen, and so when he negotiated the contract with us in 1983, he required that we develop Display PostScript and license it royalty-free to Apple as part of the deal. We needed the business; we said, “Yes, that’s what we’ll do.” So we actually began working on Display PostScript pretty early. I can’t honestly say we put our major investment in it until we got the first PostScript printers out, but we started working on it. Subsequently, as you know, Steve left Apple under difficult circumstances. The person who became in charge of product development was Jean-Louis Gassée. He wanted to renegotiate the deal, he wanted a better price, and he didn’t want Display PostScript so he threw it away. So now all of a sudden, we didn’t have to do royalty-free, and we began to encourage the business development of that product. What we discovered was that we needed permission – I mean this was obvious after the fact – we needed the permission of the operating system vendors to be successful with this technology, and of course none of them wanted to let us get in under the covers of their operating systems. And so in fact, having to get someone’s permission makes it extremely difficult. That was the beautiful thing of John’s insight about Acrobat was that we didn’t need anybody’s permission. The print drivers were already there, and so all we had to do was capture the print stream. And so that’s critical. You can’t get a potential competitor’s permission and be successful.

**John Warnock:** Does everybody remember the ACE Consortium, and I mean all of these consortiums that happened in the early ‘90s where everybody was going to unify computing? Those just absolutely never work because large organizations

won't abdicate power to a standards committee. It just doesn't happen that way. And so if you have a product where you have to go get Microsoft's permission to do something and IBM's permission to do something and Hewlett-Packard's permission to do something and all the other software vendors to do something, it'll never happen.

**Bernard Peuto:** We have a question on this side.

**Audience Member #3:** Yes, in '98 Adobe went through some tough waters and you guys had to reorganize. Could you speak to the lessons you learned in that reorganization, maybe relate just the issues that were involved, and just tell us the lessons that you learned from that painful experience?

**Charles Geschke:** Wow. I'll tell a little bit, and then you can embellish on it, John. John and I both realized that at some point we were probably going to have to find someone to replace us. And I in particular pushed John on that a little bit as we got into the mid '90s and I said, "We got to start thinking about this." And so we did what instinctively seemed like a good idea, and that is we began to go out and recruit people who had exceptional track records and great skills in their specific categories in engineering management or financial management or marketing and sales, and we began to assemble a team of people that we thought would be the right combination of folks to replace us. It goes back to my earlier comments about the culture of a company and sort of the way it deals with all of the issues that I enumerated. And we discovered that while we found people who were individually exceptionally talented and capable, they never came together as a cohesive team and understood the value of the culture of the company. So we were beginning to get into a situation in which we were not in fact going to be able to replace ourselves with that team of people, and we made a very difficult decision to basically pull it all apart and go back to developing the succession plan by working on people inside the company. And shame on us, or shame on me in particular, for not having seen that earlier on.

**Bernard Peuto:** Okay, I'll ask a question before we go to the next question. Were you basically broadsided by the web in your publishing product and how did you recover from that?

**John Warnock:** Well, yes and no. The web, obviously all of us know, sort of started exploding in 1994, and everybody hopped onto the bandwagon and started building products like crazy. There was sort of a category of web companies and old companies, and we were categorized as one of the old companies and not one of the web companies. Quite frankly, if you look at the web from a technological point of view, it's sort of a hack. HTML is a hack. It's not terribly well architected. The imaging model is extremely weak. It's still extremely weak today. And our goal was always trying to find a way to keep the values, but participate in the web, and over time; that's taken a long, long time. We didn't, because it isn't in our tradition and it wasn't in our historical context to be a "me, too" kind of company. Even though we bought a couple of products that were sort of "me, too" kind of products in that space, they were not successful and they were eventually abandoned. We were broadsided, but we weren't taken in like a lot of other people saying, "Gee, this is going to solve every problem in every way," because it really didn't solve every problem in every way. It really does deserve a better imaging model, it does deserve a better infrastructure, and I think we've taken the longer road to try to provide some of that.

**Bernard Peuto:** Question?

**Audience Member #4:** John, you said that you overcame some of the challenges by out-innovating some of your competitors, and that in retrospect has turned out extremely well. Over several years, can you say that Adobe has developed a sort of better system for evaluating which innovations to pursue?

**John Warnock:** God, I would love to say yes to that question.

**Charles Geschke:** That would make life so much simpler.

**John Warnock:** So much simpler if we had the answer to that one. You know, you sort of have to go with your gut. If you see something that really provides a value to an identifiable group and you can see where the economic connections are and say, “Gee, that’s a winner, it has a good business model, it’s a good thing. Let’s go do that kind of thing.” And then you have to have the persistence to stick with it, to finish it off.

**Bernard Peuto:** Let me add a follow on to that question because I think this is important. It happens in fact you have acquired a lot of companies, and some of your early products were your own, but a lot of your existing products were acquisitions.

**John Warnock:** That’s right.

**Bernard Peuto:** Was that a policy or was it happenstance?

**John Warnock:** We didn’t have a “not invented here” syndrome. I mean I think that we started Adobe Ventures in 1993 or something?

**Charles Geschke:** A little earlier than that, ’91.

**John Warnock:** ’91 or ’92 and the whole idea behind Adobe Ventures was Adobe was starting to accumulate a great deal of cash, and putting cash in the bank is not a good idea. So the board of directors said, “Well, why don’t you take ten percent of the cash and form a venture fund and go out and see what kind of small companies you can find and technologies you can find.” And so we did that, and the whole idea was to find small companies that we could help that also could teach us about new directions that the world is going in, and just exploit those ideas and relationships and have it a win-win situation. Adobe Ventures was extremely successful. It’s even been successful through the crash. But I think the benefit that we gained is we saw a lot of new ideas and a lot of new business plans and a lot of stuff that we could say, “Gee, this could fit into our scheme of things in the following way.”

**Bernard Peuto:** He has been waiting a long time so why don’t we go with him first? Yes?



**Audience Member #5:** John, I doubt you’ll remember this, but when I was in high school I hopped on my bike and I pedaled over to Adobe in Palo Alto with a disc in hand. I had just labored over my Macbeth term paper in high school and heard about this laser printer, so I printed my paper there. You let me in and it was such an inspiring thing that I ended up spending six years working at Adobe after college which, you know, is part of those six years. I just want to publicly thank both you and Chuck for providing leadership over the last few years. There’s been so much commentary on greed and so forth in the middle of some innovation, but the legacy for me after leaving Adobe that I carry with me, aside from the technology and that contribution, was the leadership you two provided and the human element of a company which actually leads to my next question. You know, there’s been a lot of change not only with Adobe, but companies like Hewlett-Packard and others that were held up as having a human element I guess, so I’m curious to hear from you two with these types of changes, how can a company maintain that? You know, you have to take care of shareholders and so forth, but with the rapid change, you know, I guess it’s concerning to see what can happen to a company.

**John Warnock:** Well, I think it’s really due to the people who are at the top of the company. So all of the culture of a company actually comes from the top, and it’s really what motivates those people. Chuck and I were never coin-operated. We never did this for the money. We did it because we were frustrated. We wanted to build technology and products that people actually would use, and that would actually make their lives better. And I think we’ve also taken a longer look at the markets and the opportunities and not been driven by quarter to quarter aggregation or expectations from the stock market. When Chuck said it’s a balance between the constituencies, it really is a balance. At certain times, you have to say, “Screw the stockholders.”

**Charles Geschke:** Yeah. It’s hard to predict the future. It’s always much easier to predict the past because you already know what happened. One of the reasons, you know, we’re on the board and continue our involvement is that we feel pretty strongly about the cultural values of our company, and we’re trying to make sure to keep reminding the senior management as they take on more and more of the role and responsibility that we’ve had in the past that they continue to instill that. But, you know, I don’t know anything else to do than what we have done, and that is to try and train the people from the inside. It goes back to my earlier comment. The people that we tried to bring in from the outside were exceptionally talented people, but they didn’t have the cultural values and understanding of the company and there was no way to sort of force-feed that into them quickly enough for them to coalesce as a team. There’s no simple answer. It’s like the question about how do you know whether your next good idea’s going to be a success? It’s your gut.

**Bernard Peuto:** Question.

**Audience Member #6:** John, you sort of suggested this a little bit already with how poorly HTML is architected. And so this is a question that I want to see if you guys can talk about the future. And to this day, printing web pages is kind of throwing a dart at a dartboard sometimes. Sometimes you get what you think you.....

**John Warnock:** It’s not that good.

**Audience Member #6:** Yeah exactly. You see what I’m getting at. And so, I mean one crazy solution would be Adobe comes out with a kick butt browser that, you know, prints. I’m not saying that that’s necessarily in your business plan, but what’s up with the browsers and their ability to print and businesses that need to rely on <inaudible>?

**John Warnock:** Well, my personal opinion is that the browsers have lost their way; I mean that they really are getting worse and worse and worse. They just don’t work. Printing is a total crapshoot. Formatting pages, dealing with real estate is just a crapshoot on these things. I mean I build this website for an inn my wife and I own, and the behavior on Explorer and the other browsers is a total crapshoot. You don’t know what’s going to happen.

**Audience Member #6:** So do you have any thoughts on where that could go?

**John Warnock:** Well, I think the world needs to be saved. I think printing should be dead reliable. I think you should have a great deal more control over the formatting of the pages and control over the way things look and come across. I think you should have much better control. It shouldn’t be a crapshoot. It should be predictable. It should be cross-platform and I think there is a market opportunity.

**Charles Geschke:** It sounds like a product, John.

**Bernard Peuto:** I have a question. It would seem that the greatest revenue streams and profits for Adobe come from professional products and, in reality, it is not clear if you are emphasizing consumer products despite the fact that you touch everybody with them.

**Charles Geschke:** Well, a couple of comments on that. One, as John mentioned, Acrobat is now by far our largest product, and that certainly does not go to professionals in the sense of professional graphic artists or that’s not where the bulk of the revenue from that product comes from. The other thing is with consumers, we in fact have tried to be responsive in categories where we think we can make a difference. And frankly what we’ve done in the PhotoShop arena is brought out consumer level products – PhotoShop Elements, and before that PhotoShop Deluxe – feeling that if we didn’t compete with ourselves at the low end, someone else would. And in fact it’s been very successful. We have been able to demonstrate by market studies that we have not cannibalized our high-end business; we’ve in fact expanded the market. And a lot depends on the price of digital cameras and people’s comfort level with moving from film to digital, but what we’ve tried to do is have products ready as that market develops so that we’re in that segment.

**Bernard Peuto:** Okay. Where is the next question?

**Audience Member #6:** Yes. Looking forward to a market that maybe hasn’t completely made it yet, could you comment on the electronic book and whether you see a strong future there for Adobe?

**John Warnock:** That’s a good question. I have this bias. I think that people will prefer reading off of the screen when they learn to read off the screen. So as a generation comes up that actually learns to read off of a screen, their neurons will be programmed in way where that will be the preferred method for them. Those of use who are really old learned to read off of paper and probably will continue to prefer paper and prefer documents and to print things out. And especially with books, I have to say, I really still prefer books. But it’s a generational thing. It will in fact change, and it will change as the generations grow up that have learned to read predominantly using the screen and use that as their primary tool. That’s my bias.

**Bernard Peuto:** Okay, we have one last question and then I’ll take the final question.

**Audience Member #7:** John and Chuck, I want to let you know that your belief and vision is still working because you acquired Michael Kaplan’s company and brought out Atmosphere taking another risk on the future, shooting ahead of the duck; well, today we delivered to NASA a fantastic Atmosphere world simulating space station operations and the next landing on Mars of rovers in a big conference room right over here, about half a mile from here. It’s a wonderful platform, and thanks for taking a bet on the future again.

**John Warnock:** Thank you.

**Charles Geschke:** You’re welcome.

**Bernard Peuto:** I apologize, but I will ask the last question. I’d like to talk about unsung heroes. I believe for example, you’ve already mentioned his name, and Jonathan Seybold had a tremendous impact on the industry. Very often he’s not credited like Aldus, you and Apple for the revolution in desktop publishing and probably should be. But I want to ask are there other unsung heroes that you would like to credit?

**John Warnock:** Oh, there are zillions of them. Paul Brainerd had a very significant role in the early years in sort of helping everything come together. I think of Tim Gill at Quark – they did brilliant engineering on their product in the early years. Jonathan – it was so nice to have one forum and one conference that you could go to and sort of get publishing. It’s not like a lot of industries where you have to hit thirty or forty conferences in order to cover the space. In publishing, you could cover Seybold and pretty much everybody who was anybody would be there. Jonathan was extremely helpful, he was extremely visionary. He helped us all along the way.

**Charles Geschke:** I guess by far the mass majority of the unsung heroes are the millions of customers who are willing to bet their careers and their businesses on buying products from two guys who had never run a business before. And we owe them a lot.

**Bernard Peuto:** Thank you.