Oral History of Martin R. Browne

Interviewed by:
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Martin R. (Marty) Browne

Conducted by Software Industry Special Interest Group

Abstract: Marty Browne was one of the first employees hired by Sandy Kurtzig, Founder and CEO of ASK Computer Systems. Kurtzig envisioned and developed MANMAN, a computer system for manufacturers to run their operations. The system was first offered in the mid 1970s as a timesharing service from Tymshare. Then Kurtzig formed ASK, which offered MANMAN on the Hewlett-Packard (HP) minicomputer and then ported it to the Digital Equipment Corporation (DEC) minicomputer. Browne was hired when Kurtzig was running the company out of her basement. The company saw meteoric growth in the 1970s and 1980s as more and more manufacturers automated their operations and finances. This interview discusses Browne's upbringing in the small town of Medford, Oregon, where he lettered in three sports in high school; his stint at Stanford, where he most enjoyed math, philosophy and creative writing; his temporary job that led to his introduction to Sandy Kurtzig; his career at ASK, where, for 20 years, he focused primarily on managing the programming staff for MANMAN using modular programming techniques; and his ventures since leaving the company in 1994.

Burton Grad: I'm Burt Grad and I have the pleasure of interviewing Marty Browne today, June 6, 2008. We're at the Computer History Museum in Mountain View, California, and it is 11:30 a.m. This interview is part of the Software Industry Special Interest Group's oral history project. Marty, we normally start these interviews by talking about your personal background, family, education, those kinds of things. To begin, where were you born, where did you grow up, and what was your family like?

1950-1965 – Childhood Years

Marty Browne: I was born in a small town in Oregon called Medford in southern Oregon. I say small but I think it's the fourth largest city in Oregon. Most of the people in Oregon live within a 30-mile radius of Portland, which is in northern Oregon. Both of my grandfathers came to that southern Oregon town just a little after the turn of the century. Their primary lure was pears. Both eventually planted pear orchards in different parts of the town. While I was growing up, the last piece of my grandfather's land on my mother's side was where I lived. About seven-tenths of an acre was left from that original orchard that he had planted at the turn of the century.

Grad: Your grandparents were there. Where did they come from?

Browne: Saginaw, Michigan, and Orange, New Jersey; so both from east of the Mississippi.

Grad: What about your parents?

Browne: My father was Robert C. Browne and my mother was Mary Elizabeth Browne. Not coincidentally, they were both born in Medford: My dad in 1919 and my mom in 1911. They met in 1948 or 1949, not coincidentally, on the same street where one of my grandfathers had built a house, my other grandfather's wife (my grandmother).had a house. Three or four houses on that street were part of that original settlement.

Grad: When were you born?

Browne: March 25, 1950.

Grad: You grew up in Medford then?

Browne: I grew up in Medford.

Grad: You finished high school there?

Browne: I finished high school in Medford, Oregon.

Grad: How big a town was it when you were growing up?

Browne: About 35,000.

Grad: A good size.

Browne: Good size.

Grad: Father's occupation, activity?

Browne: My father was a public accountant and it may not be important for historical purposes but he had a rare form of muscular dystrophy, which confined him to a wheelchair all during the period when I was growing up, until he passed away. But he was able to maintain a

business from the wheelchair. In his later years he used a pencil that he held in his teeth. In the earlier years he could use his hands, so to that extent he led a normal, independent life while being in a wheelchair.

Grad: How about your mother? Did she have an occupation as well?

Browne: She was a housewife. She helped my dad out a lot because he was not vehicular. I also grew up helping.

Grad: Did you have brothers and sisters?

Browne: I have an older sister. She's 12 years older than I. She left when I was 5 and got married very early.

Grad: She wasn't a major part of your life growing up then.

Browne: She was major from the standpoint that I idolized her, and we're still very close today. She was part of my mom's first marriage, so we were brother and sister on paper but her father was not my father.

1965-1968 – Early Education

Grad: You went through basically grade school and so forth in Medford?

Browne: Grade school, junior high, high school.

Grad: Good student, lousy student?

Browne: I was an excellent student. I got straight A's throughout my history. They did not have a valedictorian of the high school, and there may have been one or two others who had better grades, but I won the award for being the scholar athlete. I was quite an athlete.

Grad: What sports did you play?

Browne: I was a three-sport letterman. Football was my primary sport, then basketball, and believe it or not I was a pole vaulter in track.

Grad: Those kept you busy.

Browne: That's correct.

Grad: What are the particular courses in high school and so forth that you enjoyed especially?

Browne: Mathematics and the physical sciences were the ones I felt most strongly about.

Grad: So there was no conflict in terms of being both a good athlete and a good scholar.

Browne: It's a small town in Oregon. I was able to do well in both.

Grad: Some of the people we talk to say they had to put down their scholarly capabilities if they wanted to be accepted in other areas as they were going to high school.

Browne: May I say something tangential?

Grad: Of course.

Browne: A classmate, several years younger than I, was a gentleman by the name of Dick Fosbury. He invented the Fosbury flop, where he would flop onto his back while going over the high jump bar. But they stopped allowing him to do that in high school because they didn't think it was the proper way of doing it. I was a high jumper also, and so I learned how to high jump from Dick Fosbury. He went on to win the Olympics high jump in 1968 with his technique.

Grad: That's a terrific story. That's still the basic method used, isn't it?

Browne: It's the method used by all high jumpers.

Grad: What were your interests other than sports? Did you have any other outside activities, any other things you were involved in while you were going to school in Medford?

Browne: Nothing formal.

Grad: Did you have any summer jobs?

Browne: I always had a summer job. I took pride in being able to earn my own money.

Grad: You were in a small town. Any hunting, fishing, outdoorsy activities?

Browne: I had a good friend who would take me fishing, so I enjoyed fishing. I can't catch fish but I enjoy the sport of fishing. I am not an aficionado of guns. I don't believe in them for most purposes and so hunting is not part of my repertoire.

Grad: During high school did you build ham radios, get involved with using computers, any such things? This was in the 1960s.

Browne: You could buy kits from Heathkit, so I built a ham radio. But it was primarily a receiver so I didn't get my ham radio license because that required learning Morse code. I built an oscilloscope. There was a science company… Oh, gosh. It was out of Colorado. They'd mail you a kit every month, so when I was growing up I used to build these little science experiments.

Grad: You were interested in that kind of thing.

Browne: Oh, very much so. I was also interested in rocketry and there was a company called Estes out of Penrose, Colorado. You could order models and engines, so I was very much into model rocketry also.

Grad: You had a lot of outside activities.

Browne: Until I met girls.

1968-1972 – College Years

Grad: Did you apply to many colleges?

Browne: I applied to only the one.

Grad: Reason?

Browne: Confidence. I wanted to go to Stanford. I was a good football player, not good enough to be offered a scholarship, but good enough to have them interested in having me come there. There was no other school that I felt I needed to apply to because I knew I would get into Stanford.

Grad: Why did you pick Stanford?

Browne: A variety of reasons. Probably the primary one was that I'd visited there several times and my sister's husband, Dick Hall, whom I'm still very close to and speak to almost every day, was a graduate of Stanford. I think he was 1958, and it was a good location. It was far enough away from Medford, but close enough.

In addition, the music scene was starting out in the late 1960s – 1966, 1967, 1968 – and my favorite bands were beginning to play in San Francisco. So I saw the musical attraction of being able to see some of the finest music being created at the time.

Grad: Did you play an instrument?

Browne: Guitar.

Grad: Were you heavily into that during high school?

Browne: I played well enough to entertain myself. I had a guitar but I wasn't good enough to play for others. I had no band. I was never good enough.

Another tangential comment: My grandfather on my mother's side was a concert violinist, so music was part of my upbringing from that standpoint.

Grad: That's a very different kind of music though.

Browne: Some would say it's different.

Grad: You don't see that difference then.

Browne: Oh, no. I think the violin and classical music are equal to the Grateful Dead in some respects.

Grad: You appreciate this wide range of music.

Browne: Oh, most definitely.

Grad: That's interesting because many people focus on one, either classical or rock and roll. My kids and I had long debates on that subject at various times.

Browne: Well, fortunately it's not a topic for this discussion or we'd spend another two hours.

Grad: To get back to sports, did you play football at Stanford?

Browne: I played my first year.

Grad: The freshman team.

Browne: Yes, at that point, freshmen were not allowed to play on the varsity.

Grad: How did that work? Why did you stop?

Browne: It was a very humbling experience. I wasn't strong enough or fast enough or believe it or not big enough to compete at the next level.

Grad: But do you feel that was a factor at some level on your being accepted at Stanford?

Browne: I think it was a small factor. It was a huge factor that they had a football team. I did look at other colleges. I just didn't apply to them. Reed was on my list. It had a nine-man football team. United States Coast Guard Academy was on my list as was Army. I probably could have gotten into West Point. They actually recruited me in basketball, but in 1967 and 1968, Presidents Lyndon Johnson and Richard Nixon and the Vietnam War had a very strong pull for me *not* to go to a military school.

Grad: I can understand that. What did you major in when you went? Did you major in math to start with?

Browne: I originally created my own interdepartmental major between mathematics and philosophy.

Grad: They allowed you to do that?

Browne: They did.

Grad: You were not interested in studying music?

Browne: No.

Grad: You were interested in listening, but not in studying it.

Browne: Correct.

Grad: What particular courses did you find most interesting there?

Browne: Probably the logic courses that were associated with philosophy and algebra. Not so much the mechanics but the understanding of the proofs and what went into algebra. I could do calculus but I didn't understand it until I studied algebra and the real roots of foundational math.

Grad: Did you feel your high school in Medford had prepared you well for college at Stanford? Stanford's a very competitive environment.

Browne: It prepared me as well as I could have been prepared coming out of Medford.

Grad: Were you a good student at Stanford?

Browne: I was good enough, I think.

Grad: Were you busy doing other things?

Browne: No. I was good enough to graduate with honors and be accepted to a Ph.D. program at the University of Oregon.

Grad: That's impressive. While you were at the university, what activities you were involved in?

Browne: I certainly played intra-mural sports. I was not involved in politics to the point to where I was protesting, but you have to remember 1969 and 1970. They closed university down.

Grad: Did Stanford close down also then?

Browne: Yes. In the spring of 1970 they closed down.

Grad: I don't remember that.

Browne: I was very interested in writing, creative writing, so I had a teacher named Ed McClanahan. I don't know whether you're familiar with Ken Kesey and the Wallace Stegner

program at Stanford. I was on the periphery of the Ken Kesey- Merry Prankster - Larry McMurtry circle. I was there a little bit after them. I fancied myself as being able to write pretty well.

Grad: Unusual combination between mathematics and writing. That doesn't often come together.

Browne: That is correct. The reason I studied mathematics at Stanford was so that I didn't have to write papers.

Grad: Yet you liked creative writing.

Browne: I liked creative writing but creating an eight-page paper with a bibliography was painful.

1968-1972 - Early Computer Experience

Grad: Did you get exposed to computers while you were at Stanford?

Browne: The only computer courses offered to undergraduates were two computer courses – I think 105 and 106 – and there was no computer science major in 1968 through 1972, so my exposure to computer languages was limited to ALGOL, and somewhat to Pascal. The IBM 360/65 was the computer we used to compile our programs. In those days you created punched cards with programs and data on them, so I was exposed to computers to the best of Stanford's ability for undergraduates. There was a series of courses for electrical engineers about the internals of computers – AND gates, NAND gates, and electrical pulses. I chose not to get in to that.

Grad: Did you learn to program in ALGOL at school?

Browne: Most definitely. I could write a program today if you wanted me to.

Grad: Were you just doing things for the class or were you doing anything else?

Browne: I wasn't doing anything outside of class. We pretty much just solved mazes. They weren't business applications. There were direct associations among Stanford, Hewlett Packard and Synergy. I knew of them because they were local and famous, but I was not involved in them.

Grad: Anything else about college that you'd like to add, particular professors or teachers who impressed you?

Browne: I had a number of teachers that were excellent. Professor Suppes was in logic and there were a number of people in the math department whose names escape me.

Grad: Suppes is well known. Anything else? You were still single, I assume, while you were there at college.

Browne: I was single, but I had a very close relationship and we got married within two weeks after I graduated.

Grad: That was another interest of yours while you were at college. I just wanted to check and make sure.

Browne: I could say that I was trying to get out of the draft by being married but that was not quite true.

Grad: You graduated in 1972.

Browne: Correct.

Grad: Did you get out of the draft? They were still drafting, I think.

Browne: They were still drafting. They had a lottery and my lottery number was based on my birthday. I had lottery #342. The draft did not get up to that number, so they did not get me. If I'd had a lower number, I might have been drafted, but I would not have gone. But I didn't have to deal with those logistics.

Grad: Some of my kids are in your age range and had to deal with those kinds of things. Now you're graduating, you're going to get married.

Browne: Yes. May I also add that I was involved in politics quite heavily, both the McCarthy and McGovern campaigns. I believed in Eugene McCarthy and in George McGovern, but I did not believe in Richard Nixon or the war, so I spent a lot of time doing door-to-door campaigning.

Grad: That was significant for you.

Browne: Very significant to me.

Grad: Have you maintained your interest in politics?

Browne: I am a Barack Obama supporter. I volunteered and have done phone calls on a variety of his campaigns.

Grad: This has continued off and on or pretty much consistently through your lifetime?

Browne: There have been important times in our country's history. I think this is one of the most important times in our country's history.

Grad: I don't disagree with you. You're graduating and you're going to get married so it's time to think about what are you going to do to earn a living.

Browne: Somewhat, Yes. I could have gone to graduate school and that was my intent. My wife at the time got a job teaching. She got her teaching degree in STEP [Stanford Teacher Education Program], and then got a job at San Jose High School teaching. So I decided I'd work for a few years.

Grad: What was your first job? How did you get it?

Browne: In those days, 1972, companies did not recruit on campus saying, "We want you students to come work for us." I got a sticker on my student body card that said I was still a student so I got most of my jobs through the temporary employment agency at Stanford, doing gardening, painting houses in Atherton, and other manual labor.

Grad: You had some programming skills. I know the recession started around 1970 and went on for about two or three years, but there were still programming opportunities. Is that anything you pursued at that point in time?

Browne: In my field of study, there weren't programming jobs per se. I only took two computer courses. There was only one language that I had, so I did not initially become a programmer.

Grad: When you thought about what you were going to do to work what possibilities were you thinking about originally?

Browne: Those were frightening times in 1972. Jobs were very difficult. I got my accounting degree through the mail because my father had been an accountant. So I did this six-month course not so much for the degree as for learning about accounting pretty heavily. And perhaps I would be an accountant. It was a skill that I thought might be valuable.

Grad: Where were you and your wife living?

Browne: We were living right near Stanford, in a little area of Palo Alto called the College Terrace, just a stone's throw from Stanford.

Initial Involvement with ASK – 1972-1974

Grad: Tell me how you got involved with ASK, how you made the connection there.

Browne: One of the temporary jobs at the Stanford placement agency was posted by Sandy Kurtzig, the founder of ASK. I believe her husband was getting his Ph.D. at Stanford at the time. Sandy had been with General Electric selling services for General Electric Timesharing. Then she started her own business using GE Timesharing and using her programming skills. She had convinced a manufacturing company called Farinon Microwave that she could help them computerize their bills of material and provide "a manufacturing system." I put that term in quotes. She wanted someone to translate the bills of material that were on punched cards onto computer transaction sheets that she could punch up and get it into her set of programs so those bills of material could be printed and replace the manual bills of material that were called "the Bible" at this manufacturing company.

Grad: Keep going. Is that the job she was advertising?

Browne: Yes. I was hired by the manufacturing company to translate the bill of material information from their manual system into Sandy's set of programs.

Grad: It was transferred onto punch cards then?

Browne: Correct. I did not physically punch the cards. I wrote computer transaction sheets that had a code associated with six different transactions that you might do to a bill of material: add a part, delete a part, change the reference designators, and simple things like that. If that bill of material were in the computer, you could change it based on these six transaction codes.

Grad: You say you programmed that?

Browne: No. I wrote the transactions onto computer transaction sheets that were 80 columns wide. These sheets would change the physical bill of material that I saw visually into a bill of material that the computer might see.

Grad: Who had written the programs to handle that? Had anyone worked on that yet?

Browne: That's an interesting question. Sandy was working on the programs that would store the bills of material in files on an IBM 360/65. So she was working on the programs.

Grad: She had access to a machine?

Browne: She had access. She rented time from a company called OSI.

Grad: Your job was basically a clerical job.

Browne: It took quite a bit of thought to envision what the computer thought because I couldn't see what the computer thought because Sandy hadn't finished the programs. I had a theory of what her programs were going to do, and how the bills would look in the computer, so based my work on that theory, I created transaction sheets that would be translated into punched cards.

Grad: How long was that assignment?

Browne: That should be a short answer. I spent two months creating transaction sheets without ever seeing anything from Sandy that reflected what the computer-generated bills were going to look like because her programs either didn't work or she was busy.

Grad: But you were an employee of the manufacturer.

Browne: Correct. I was an employee. So about two months transpired where I had prepared a stack of transaction sheets based on my theory of what the bills were going to look like from Sandy's programs. I had met her a couple of times, but then one day she came in with her first computer printout of the bills of material – and all my theories were incorrect. They were incorrect because the date she had for her bills of material to be computerized was different from my date. Bills of material change all the time. People mark them up. I had taken their markups based on a date when I thought the bills of material were going to be computerized and that date was incorrect. I didn't understand the significant of this mismatch but I had to start all over again.

Grad: What did that mean you had to do?

Browne: Every transaction sheet that I had filled out for two months got thrown away.

Grad: You couldn't re-use any parts of them or anything?

Browne: Not one part of it.

Grad: Then what happened?

Browne: Then what happened was that I finally had a reference point for what the computer thought the bills of material would look like and that was in a physical binder that Sandy could create. Then I sort of had to match the bill of material changes that were happening manually all the time in the manufacturing shop with Sandy's computer sheets. We had maybe 2,000 manual bills of material – "the Bible." So I had to start from the beginning. It was like painting the Golden Gate Bridge. By the time you got to the middle, things had changed. So it took me probably two years to get the bills of material from the computer to the point where the people at the manufacturing company fully trusted them. Two years!

Grad: When did you start working in this?

Browne: Oh, September 1972. Well, it was probably about a year before they started trusting the bills.

Grad: Was this pretty much a full-time assignment for you?

Browne: It was full time. I was a full-time employee.

Grad: This basically covers that period of 1972 to 1974?

Browne: During that period I was able to explain to Sandy all the other necessary components of what the manufacturing company needed: something called an MRP [Material Requirements Planning], purchasing, all the other parts that needed to go in to make a system do something useful.

Grad: I was trying to make sure I understand because I know you formally joined ASK sometime in 1974.

Browne: Correct, October 22, 1974.

Grad: You graduated in June 1972, I assume, so we've got almost a two-year period there and you said you were doing temporary work.

Browne: I got the job through the temporary agency but since I didn't have any other jobs at that point, it was a full-time job for me.

Grad: Basically full time, but you were not doing programming.

Browne: At that point I was not doing programming. At a certain point I was able to see the FORTRAN code that Sandy had written and I could explain to her the changes that needed to be made in the code in order to make it work.

Grad: Did the Algol experience help you as far as the FORTRAN code was concerned?

Browne: Yes. Yes. Sure.

Grad: Structures and so forth?

Browne: Yes, and I understood the concept of what files were.

Grad: What's interesting is that instead of starting from a programming standpoint on to how to build a program you started from the user standpoint as to what they needed.

Browne: That's exactly correct.

Grad: That's interesting because my experience in manufacturing was working at the Large Steam Turbine Department at General Electric Company before I started ever doing punch card or programming work. So when I came to start to do those applications a couple of years later, I had been there; I had seen them. That made a big difference to me.

Browne: It made a huge difference to me and to the programs. Do you know what a Kardex file is?

Grad: Sure.

Browne: You keep track of inventory on them. And another part of the Kardex system is that you've got purchasing (who you buy the things from) and so the purchasing cards were used by purchasing. The Kardex card told you how many parts you had on hand. So when the

inventory changed, you had to go and mark up the Kardex card and reduce the inventory. And then we would set up when to buy again with the reorder point.

1973 – Tymshare, Sandy Kurtzig, and the MANMAN Program

Grad: To recap, Sandy had been doing work in GE on reorder point calculation, optimum lot size calculation, those kinds of things. At some point you'd also been working on this, so you started to communicate with Sandy about manufacturing needs, what she'd left out, what was needed for a full-scale system.

Browne: Correct.

Grad: Now she at some point says she's going to hire you?

Browne: Yes. In 1973; while I was at Farinon, she developed a rudimentary timesharing system called MANMAN. That's where the name first came up because Tymshare required that there be a six-letter reference to a program. She'd originally called the system CAMP, Computer Assisted Manufacturing Program. She then wanted to call it Mama but Tymshare required her to call it MANMAN. So she had a project in the summer of 1973 that created a rudimentary bill of material, purchasing, inventory system on Tymshare's network.

Grad: So MANMAN was to run using Tymshare.

Browne: Correct.

Grad: We've interviewed Tom O'Rourke and have oral histories about Tymshare.

Browne: I know him only too well.

Grad: She wrote this program.

Browne: She hired a summer student to do some of the programming. She did some of the programming. Sandy's wasn't patient with computers and programming; she had good vision, but she personally wasn't very patient with what it took to make the programs run.

Grad: Did someone write a specification for MANMAN?

Browne: How long have you been in the computer business?

Grad: Longer than you.

Browne: How often have you seen a specification turn into a program? But maybe you came from a different background.

Grad: While I worked for GE, we had to write what we wanted the report to look like. We even did some flow charts in the 1950s.

Browne: We prototyped and then we documented.

Grad: That's what I'm trying to get at, because a lot of our work used the waterfall approach: We first did specification, then design, then testing and so forth. This was true at GE and then later at IBM. But by the 1970s there was a lot more of the new prototyping approach where you build a quick and dirty working model, then refine it.

Browne: Yes. I think the evolution of most of the MANMAN code did not take that traditional waterfall approach that you're familiar with.

Grad: That's why I'm asking, because I believe a lot of the programs in the minicomputer field were developed using prototyping – let's build something that'll work, then let's add some more and make that work – rather than take a product design approach of specifying and designing the entire system up front.

Browne: Correct.

Grad: That's why we're trying to see if MANMAN was of that nature. That's not referenced in Sandy Kurtzig's book at all [CEO}

Browne: No.

Grad: You built something that would work or try to work, and if you found something wrong you built it again.

Browne: Correct.

Grad: With her timesharing program, was Sandy expecting various customers to use it or did she expect just one primary customer to use it?

Browne: I think she expected a number of customers to use it. We had one large customer which was the majority of the revenue. I think it was about $30,000 a month. I think the marketing in that case came through Tymshare. Sandy was not selling. She relied on the Tymshare sales force.

Grad: Were they getting some kind of a piece of the action besides the sale of their time or just getting the sale of their time?

Browne: They were just getting the sale of their time.

Grad: They didn't mark it up because it was an application they were running?

Browne: I can't remember the economics.

Grad: There were different models. I know for example National CSS was marking up the use of their time if a customer used one of their programs. They were using RAMIS, for example, and if they wrote the program using RAMIS, they would mark it up not just for the RAMIS use but also for the application use.

Browne: That probably happened with the Tymshare system.

1974 – Joining ASK As An Early Employee

Grad: Tell me again. You were hired in October?

Browne: October 22, 1974. Do you know why I know that?

Grad: No.

Browne: Because it's Sandy's birthday.

Grad: Were you a birthday present for Sandy?

Browne: It's also Tim Leary's birthday.

Grad: I'd forgotten about Tim Leary.

Browne: I may be wrong. Sandy's birthday may be the 21st.

Grad: What transitioned you from those two years' worth of getting those bills of material ready to be accepted by the client and then you were going in to actually starting to help on developing a program?

Browne: What caused me to leave the manufacturing company and go work for Sandy?

Grad: Yes. Tell me about that transition.

Browne: Well, the transition was such that I was being paid $1050 a month and was very well respected at the manufacturing company. They liked what I was doing. They wanted to keep me. Sandy is a very good salesperson. She said, "We've got these opportunities. I need your help." At that point she had a client called Powertec, and an HP salesperson had convinced Powertec and Sandy that she could duplicate what she was working on for Tymshare using one of their early HP computers. So Sandy had a project and she said, "This is easy. I want you to come along. We'll build it and life will be wonderful."

Grad: Did she give you a lot more salary? Did she give you a piece of the company? What did she do?

Browne: She would not initially give me any more money because she didn't want me to think that I was going there for additional money, but I negotiated $1100 versus $1050.

Grad: But no stock or anything like that.

Browne: There was no such thing as stock in those days. There were stock options. But Sandy's point was that the stock was worthless, saying, "I'm not going to use stock as a carrot because it's not worth anything."

Grad: Some people felt just the opposite and even later of course much more so.

Browne: Yes.

Grad: But this is Powertec's machine? This is not HP's or anyone else's?

Browne: Powertec is a client. It is a Hewlett Packard machine.

Grad: This was a user. They had an HP?

Browne: Yes**.** Powertec delivered that HP computer to us for us to program it.

Grad: What machine was it?

Browne: That was an HP 2100.

Grad: What language was it going to be programmed in?

Browne: FORTRAN.

Grad: By this point you had learned FORTRAN or did you learn it then?

Browne: I don't recall. My contribution wasn't so much the programming language. I probably learned most of my FORTRAN when I inherited the Tymshare system that was created in 1973.

Grad: What was your title if there was one in your first job? Were you a programmer? What were you?

Browne: I think that if I had a title, my first title would have been operations manager.

Grad: You were running the HP 2100?

Browne: We were working in Sandy's house in the basement. There was not a large organizational structure associated with it.

Grad: My point is that you were responsible for running the HP 2100 as well as running the project.

Browne: No. I was not responsible for running that project .There were a number of other people in the company who were also working on it.

Grad: You give the impression that you were one of the early employees.

Browne: That is correct.

Grad: Were there other people who were hired at that point in time?

Browne: There were other people who worked for Sandy by the time I joined the company.

Grad: Half a dozen people altogether or less?

Browne: Three maybe.

Grad: The goal specifically was to take the timesharing program and move it over and get it working on the HP 2100. Is that correct?

Browne: That's correct.

Grad: You had that specific goal because you had a particular client who was going to pay you to have that work on their HP 2100.

Browne: Correct.

Grad: I'm going to talk about this ten-year period from 1974 when you joined ASK. Do they call it A-S-K or do they call it ASK?

Browne: Different people called it different things. I think in the early days we referred to it as A-S-K. At the end it was called ASK.

1974 to 1984 – Browne's Work at ASK

Grad: Let's talk about the time period 1974 to 1984. This is when you first joined the company, and in 1984, if my memory serves me correctly, Sandy left the company to do other things. By then it was quite successful. I'd like to understand the kinds of roles you played during that ten-year period and what was going on.

Browne: I was appointed Vice President in 1977. From 1974 to 1977 was a growth period. The growth period for the entire history of ASK was pretty extraordinary.

Grad: Phenomenal.

Browne: So by 1977 I had been appointed Vice President because there were no other Vice Presidents.

Grad: You were the first one if I remember correctly.

Browne: Right.

Grad: In those first three years were you personally programming? Were you managing people programming? Were you doing a mixture of both?

Browne: I was doing all three. I was programming, I was managing programmers, and I was helping with sales to the extent that there needed to be someone who understood manufacturing, was credible, and could talk the manufacturers' language.

Grad: Were you still primarily working on the HP 2100? Had you shifted by then to the HP 3000?

Browne: The HP 2100 became the HP 1000. But we never successfully got the HP 2100 "working." Our first real success with the minicomputer was the HP 1000. That stood us in pretty good stead. I can't remember the exact years, but by 1978 I think we had successfully converted to the HP 3000. I use the term "converted" because we wrote it from scratch for the HP 3000.

Grad: It was a rewrite then at that point?

Browne: Yes, every version was a total rewrite.

Grad: Was the Tymshare system still being used?

Browne: Tymshare sort of drifted off. It was too expensive, and the programs that we had on the HP 1000 and certainly on the HP 3000 were far superior to the Tymshare system.

Grad: It's interesting that the economics of getting your own machine at the mini level made many of Tymshare's operations just go away.

Browne: Correct.

Grad: Tymshare pretty much died as did National CSS. Almost all of them died at that point because of the minicomputer.

Browne: Right. However, we found that processing service was still a big business so we created a timesharing service called ASKnet and rented time on it to customers. It was a huge part of our business for a period.

Grad: That's an interesting strategy: you provide a network facility, then when they buy their own machine, you help them transition to their machine.

Browne: Right, we had their database and we could convert them.

Grad: IBM's old Service Bureau Corporation operation had that same objective. Get you to use it on a service bureau basis and if you're happy with it, you'll get your own computer and use their help in the transition.

Browne: It's interesting that in today's world the terminology is "Software as a Service" [SaaS]. They've created a new buzzword for what we called ASKnet.

Grad: Well ASPs [Application Service Providers] are basically in that kind of business, aren't they?

Browne: Correct. I think that's an old buzzword. I think "software as a service" is a better word.

Grad: Is that a new one?

Browne: Yes.

Grad: Okay, I'll change my terminology. Someone used that term at the meeting the other day so I thought maybe it was still alive and well.

Browne: "ASP"? No, "ASP" is not quite as alive as "software as a service."

Grad: I will use that one. Sales are starting to pick up during this period?

Browne: Correct.

Grad: The revenue growth rates are quite large from basically nothing or trivial. I don't remember the figures. You gave me a 1983 report which I looked at. You were about $35-40 million, if my memory serves me correctly.

Browne: In 1983, yes. When we went public, we had about $15 million in revenues and I think that was September/October 1981.

Grad: So that's quite an impressive growth for that period of time. Today we would consider that slow but at that point that was pretty impressive.

Browne: Correct.

Grad: Was there a sales force that Sandy put in place?

Browne: Yes, the second Vice President that Sandy hired was Tom Lavey. He came in pretty early. I want to say 1976; so Sandy created a sales force really early on.

Grad: She had been doing the sales primarily? She was the salesperson prior to that?

Browne: Yes that is correct.

Grad: You were supportive, but sales was not your principal responsibility.

Browne: I'm not a good salesman.

Grad: Let's talk about 1977 when you were given the title of Vice President and you had half a dozen people working for you.

Browne: Maybe I had ten people.

Grad: That many?

Browne: Yes.

Developing MANMAN on Hewlett-Packard Minicomputers

Grad: Were you still using FORTRAN as your language?

Browne: Yes.

Grad: Did you find any problems with it as far as business use was concerned?

Browne: No. Tangentially we called it Business FORTRAN. The ugly things in FORTRAN have to do with string manipulation and currencies. We used a database system called Image from HP. We created a library of FORTRAN subroutines, and the construction of MANMAN was based on using these subroutines, whether they ran in FORTRAN or not. The real beauty of any programming project in today's world is that they use objects. We called them subroutines. We had a library of FORTRAN subroutines that we used extensively.

Grad: You were customizing these programs when you delivered them, or did you deliver them pretty much as a package?

Browne: We delivered them as a package.

Grad: Customer Z would get the same package as Customer X?

Browne: Correct. Let me point out something. Let's use Customer 1, 2, and 3. Customer 1 would ask for some changes. We'd incorporate those into the standard product for Customer 1, and Customer 2 would get that enhanced version. Customer 3 might request something else. We would then deliver to Customer 1, Customer 2, and Customer 3 everything we put into the package.

Grad: So you kept incrementing.

Browne: We kept incrementing, yes.

Grad: One of the issues that has happened more recently with SAP, for example, is that there seems to be a great deal of both customization and training required in order to install the systems.

Browne: Correct.

Grad: Did you have those needs then? Was that a problem?

Browne: As the systems became more complex, and as the business problems we were trying to solve became more complex, more training, implementation, and modifications were required. I'm not going to compare ourselves to SAP, but the more complex things became the more training and services were required.

Grad: Were you providing services in addition to your products?

Browne: Yes.

Grad: When did you think of this as a product? How soon?

Browne: I think Sandy thought of it as a product even as early as 1974. I mean she had a name for it. That's all it requires is a name, right?

Grad: No, it requires that there be a package, some kind of a productization, as the term is often used.

Browne: Yes, that happened very early on.

Grad: So did testing, putting it together as a package, and documentation happen relatively early as well?

Browne: I could answer each one of those pieces specifically.

Grad: Go ahead.

Browne: Documentation was a fundamental piece very early on.

Grad: Both documentation of the program and user documentation, or didn't you bother with documentation of the program?

Browne: They were one and the same. The documentation of the program was only for the users. The documentation of how the program worked from the programming standpoint was pretty much built into the program.

Grad: Did you do a lot of notes on the FORTRAN programs?

Browne: Some of the programmers did.

Grad: Did you establish standards?

Browne: Very early on, I personally created a bug tracking system, which could also be used as an enhancement tracking system. Every change that went into the code was documented in the header of the code and it was documented in a separate database. If it had to do with a bug, it referred to a specific bug. Very early on in the process we established some very formal controls.

Grad: That's a lot of good discipline for early on. Where'd you get the idea from to do that?

Browne: Necessity. This may sound tangential but I like lazy programmers. I like programmers who can create subroutines so they don't have to redo them. The first time you fix a bug, you compile it, you put it into a library, and then you deliver it to a customer – and you've

forgotten that you've done it all that way. You may solve the customer's problem, but there's no trail associated with it. So it was probably out of laziness, so that we could always go back and refer and find out what happened. As I get older those sorts of things, you know, it's like memory. When our memory starts failing, how do we make our lives work? We make lists, and things of that nature.

Grad: Change control systems are critical. I worked for large companies, GE and then IBM, and we had disciplined processes, and I happen to think that way so I like it. But it's interesting that a small company working in the minicomputer area put in that kind of change control and bug control very early on. That's terrific. That's very impressive.

Browne: Yes, part of our success was because we did that really early.

Grad: I'm sure that was a major factor too. Some of the mathematical stuff is pretty straightforward. You did not build a Bill of Material Processor per se. Or did you build that as part of the system?

Browne: In the terminology that you use from IBM, I would say that we had a Bill of Material Processor. I mean we had a file that represented the Bill of Material. When you say "processor" what can you do with a bill? Can you print it out? Can you make it do the work order?

Grad: Well this was sort of an underlying thing. IBM's IMS database was another level up from Bill of Material Processor.

Browne: How about DBOMP?

Grad: Yes. And then of course the people who did IMS had been working with that kind of thing and that's what I was wondering. Were you aware of that work?

Browne: Yes, sure. I had the original COPIX manuals. And I had the original Burroughs manuals for the Burroughs minicomputer.

Grad: How did you know about those?

Browne: APICS was one organization [which had knowledge of these materials].

Grad: Were you in it?

Browne: Oh yes. ASK was an early member. You had to be a member. You could not be a participant in that market without being a member of APICS.

Grad: We're doing articles on IMS. We're doing a special issue of the Annals of Computing History, and on all the major DBMSs [Database Management Systems] that were on mainframes in the 1970s, and there were eight of them altogether that were significant. We're getting two articles on IMS and one on the others. But one of the articles is from a historian who's tracing just this point you make that there's a clear progression that comes from the Bill of Material Processing, to DBOMP to the file management systems that lead up to these database management systems. They didn't come from nowhere.

Browne: Yes, that's fascinating.

Grad: So it's a fascinating story. Image from HP is somewhere along this continuum.

Browne: Correct.

Grad: Did you use Image?

Browne: We used Image. Image was one of the reasons we were successful. Image worked really well. It was in the terminology of databases, there were hierarchical databases, relational databases, and network databases based on Codasyl [Conference on Data Systems Languages] standards. One of the primary databases at that time was called Total, if you remember Total.

Grad: From Cincom. We're getting an article from Tom Nies for our issue of the Annals, Yes.

Browne: So Image looked a lot like Total. Some people say that the word Image was because it was an Image of Total.

Grad: When does the Image DBMS come out, around 1975 or so?

Browne: Image was actually on the first HP 2100 and on the HP 1000. So there were versions of Image prior to the HP 3000.

Grad: When did you start using it?

Browne: We started with the HP 2100. On the HP 1000 we used Image.

Grad: That must have saved a lot of effort having a database management system.

Browne: It was crucial. We could not have built MANMAN. We could not have built a business application without a database manager. We could not do it.

Grad: We did do it earlier because in programming systems in the 1950s we didn't have some of these tools.

Browne: If I had to put my finger on one critical tool, Image was that critical tool.

Grad: Did it perform well?

Browne: Yes.

Grad: So it didn't eat up performance cycles on you too badly?

Browne: Not too badly.

Grad: Were you running it as a transaction processing system?

Browne: Yes.

Grad: Where did you get the communication side, the transaction processing side?

Browne: You and I have different languages.

Grad: Use your words.

Browne: The HP 2100 was a disk operating system. It did not have a multi-terminal capability. At any given point in time, the HP 2100 could only process one event. To process multiple events, so that people sitting around could operate on multiple terminals, HP had a product called TCS, Terminal Control System on the HP 2100.

Grad: What did they do with the HP 3000?

Browne: The HP 3000 was a different architecture, and I don't know the internals well enough to tell you what the name of the communication protocols were.

Grad: The original HP 3000 was supposed to be time-sharable. But I have been told that it didn't work. It was recalled and then rebuilt with enough memory to do the swapping they needed for a timesharing system. So the impression I got was that they must have had some kind of a transaction processor, an online capability that allowed multiple terminals to access the system without interfering with each other.

Browne: Correct.

Grad: IBM's CICS [Customer Information Control System] did that on the IBM mainframes. So, I was just wondering if there was a named program with Image.

Browne: I don't recall. There probably is if you talk to the people that have knowledge of the internals. Image was built into the HP 3000 operating system, so we, as programmers, on the HP 3000 took it for granted.

Grad: That's the difference, because IBM's CICS was a separately priced program.

Browne: I know it only too well. We had a brief foray into CICS and IBM.

Grad: Really? When?

Browne: In the 1980s.

Grad: A later point in time. By that point, CICS on mainframes were the standard. Everything else disappeared.

Browne: Yes, but there was another virtual operating system called VM [Virtual Machine].

Grad: VM 370 was another one that I got announced.

Browne: We battled with VM long enough to try and go back to CICS, but we couldn't get either of them to work.

Grad: You were trying to migrate to a mainframe environment?

Browne: Correct.

Grad: Ah, we'll come back to that. That's interesting.

Marketing MANMAN

Grad: You built ASK essentially using the HP 3000; did it become your primary sales platform?

Browne: Yes, we sold probably 20 HP 1000s before the HP 3000.

Grad: Do you remember the pricing?

Browne: A maximum of $100,000 for all the software packages.

Grad: What did you have, four or five modules or more?

Browne: Ten if you counted all of them. Sandy used what she liked to call the fudge test. It's $10,000 per user per month.

Grad: Per module?

Browne: Per module, Yes.

Grad: But these modules were developed over time.

Browne: Correct.

Grad: So the initial system had what, two or three modules?

Browne: Yes. We modularized it based on the business application, first manufacturing, and then financials, which included accounts payable, general ledger, fixed assets and payroll.

Grad: The accounting sort of naturally breaks into at least those four pieces.

Browne: Correct.

Grad: You can have another cost accounting module and things like that, but manufacturing doesn't break quite that simply in my experience.

Browne: You can talk about it philosophically, but it doesn't break itself into modules the way financials do.

Grad: Yes, you can talk about a planning module or a projection module.

Browne: That's where you get into marketing and sales.

Grad: But did you have a separate inventory module?

Browne: It wasn't a module. It was built into the whole thing.

Grad: Purchasing?

Browne: We had the purchasing function, correct. But you couldn't buy purchasing standalone from manufacturing.

Grad: On the manufacturing side you had to buy the core packages all together.

Browne: Yes, the core MRP [Manufacturing Resource Planning] or ERP [Enterprise Resource Planning].

Grad: ERP is a later terminology, isn't it?

Browne: Correct. MRP, ERP, ERP 2.

Grad: Yes, as you kept expanding what was being defined in the product?

Browne: There are new terminologies that I can't talk as eloquently about, such as lean manufacturing, if you're familiar with that development.

Grad: To get back to our timeline, you were made VP in 1977, and the product line was expanding. When did you pick up the financial package?

Browne: We developed the financial packages initially on the HP 1000.

Grad: So it was early.

Browne: You can imagine that a manufacturing company, once they successfully were using the manufacturing applications, needed the financial applications. If you have a purchasing system you need an accounts payable system.

Grad: One of the questions, though, is: At that point in time, because this was still relatively early, were there any other vendors offering significant financial packages on the HP 1000 or the HP 3000?

Browne: On the HP 3000 there were companies specializing in financials. I think Smith, Dennis & Gaylord is one of those. There were a lot of general ledger [GL] packages. GLs were early.

Grad: All over the place.

Browne: Yes, Walker. Remember Jeff Walker and Walker Associates?

Grad: Yes. He was an active member of ADAPSO [Association of Data Processing Service Organizations].

Browne: He was the primary developer of the initial Oracle application suite.

1977 to 1984 – Expansion at ASK

Grad: Okay, you were a VP in 1977. Over the next seven years, what was your primary role, just continue to build the product line?

Browne: My primary role was pretty much managing the programming staff. I had one foot in marketing, one foot in development, and one foot in sales. I was an anomaly in that I could talk to the end customers, to the sales force, and to the programmers.

Grad: Your staff was building the product. Your numbers of people were going up in development.

Browne: Correct.

Grad: So you still had the direct line responsibility for the development function during this period.

Browne: Correct.

Grad: Did ASK make any acquisitions during that time?

Browne: Yes. However there were a couple of other probably important pieces of data. One was that before we went public, Sandy beefed up her management team. She brought in Ken Fox who became Vice President of R&D. I became Vice President of Application Development, so from a reporting standpoint, I reported to Ken. The programmers reported to me. He had certain direct reports, so there were some reporting structure changes during that period of time.

Grad: Did that upset you at the time?

Browne: It upset me from the standpoint that Sandy did not talk to me about it before it happened. She didn't talk to anyone within the development group either about this going to happen. My core development team, which liked me quite a bit, got T-shirts printed up and wore them on the day Ken started. I did not wear mine. It said "ASK me if I care." Sure, it upset me.

Grad: I'm not surprised. Now this is still in that 1974 to 1984 time period.

Browne: Correct.

Grad: She brings in a VP of Sales. How was your relationship with him?

Browne: With Tom Lavey? Excellent. He saw my value in terms of he needed me to create programs, and needed me to talk to the customer's manufacturing people.

Grad: So you felt good about what he did.

Browne: Yes, I did not have a problem with Ken Fox either, I mean personally. He and I got along great.

Grad: In 1981 Sandy takes ASK public.

Browne: Correct.

Grad: So she spruces up the organization chart before she goes public.

Browne: Correct.

Grad: And who else does she bring in? She brings in Fox. She already has Lavey. Who else?

Browne: A new controller was brought in who took over from the controller who left. The old controller took a different tack. When he got a new boss, he left. When I got a new boss; I hung around.

Grad: Smart.

Browne: I had stock options at that point.

Grad: Before going public I'm sure she gave out options.

Browne: We negotiated my package in terms of stocks pretty early on.

Grad: Even before that?

Browne: Within the first year I was there.

Grad: Oh, okay. So that was an early decision. Good.

Browne: Sandy needed to be able to offer stock options to other people she brought in, so she created structure and once she created structure, she was generous to be able to give me my original options.

Grad: I was just relating to your earlier comment that her first reaction was that the stock was worth nothing.

Browne: That was in her first year.

Grad: But after that she saw how this thing should change.

Browne: Yes, she got a Board of Directors and lawyers. She understood. People were starting to go public at that time in 1981.

Grad: In 1981, yes, not much before.

Browne: So she understood the structure and I don't think she believed probably until 1979 or 1980 that there was value to the company.

Grad: But you had negotiated your deal much earlier than that.

Browne: Yes.

Grad: Good, smart move. Was anybody else hired then who was really significant during that period of time?

Browne: Jim Manion was Vice President of east coast sales.

Grad: The public offering worked out nicely?

Browne: It worked out very well for Sandy.

Grad: And all of you had options, so hopefully it worked out well over time for you.

Browne: Over time it worked out okay.

Grad: When did you start porting, moving to other platforms?

Browne: I think in the late 1970s we ported over to DEC [Digital Equipment Corporation] minicomputers.

Grad: So that was your first port outside the HP environment?

Browne: Our first successful port.

Grad: Did you try some before that didn't work?

Browne: We tried IBM. We tried Data General minicomputers at one point in time. We had an early DEC port, so there were a couple other sorts of business relationships that we got into – as far as even getting a computer. But nothing became successful until we actually ported to DEC.

Grad: Did you have a DEC customer at the time you ported?

Browne: I'm sure we did.

Grad: So there was a reason for doing the port.

Browne: It was a huge marketing reason. There were companies that were manufacturers that would not purchase Hewlett Packard. They would only purchase DEC. If we were going to grow, we had to have a second vendor. We couldn't be single-sourced to HP for a variety of reasons.

Grad: Was it the relations with HP that prompted you to look at DEC, or was it just that it was another opportunity?

Browne: It was another opportunity.

Grad: So it wasn't that it was a bad relationship situation.

Browne: Not at any point in time.

Grad: Okay. Because sometimes people do it to give themselves leverage in negotiations, that kind of thing. Were you selling hardware at that point in time?

Browne: Yes, we sold hardware pretty early on, even, I think, with the HP 1000 we were selling the hardware.

Grad: And so you had some kind of a deal with HP. You talk about the kind of discounts that were being offered and Harper Thorpe of HP mentioned the figures of somewhere between 15 percent and 40 percent or so depending upon volume.

Browne: I think that was probably correct.

Grad: So you were delivering full systems, hardware and software. Was that the most common delivery form or was the most common delivery just software?

Browne: Most common was delivering full systems.

Grad: When you went to port to a DEC machine, did you work out the same kind of a deal with DEC?

Browne: Yes we did.

Grad: So you were a DEC reseller. So you were really a VAR [Value Added Reseller] in that sense of the word.

Browne: Correct.

Grad: I always think of ASK as a software company. I don't think of it as a VAR. Isn't that interesting?

Browne: Yes. Historically, the company name was ASK Computer Services. When we started selling hardware, Sandy took "Services" out of it.

Grad: Just ASK Computer.

Browne: ASK Computer Systems. I think we were always a services company also, but the name did change.

Grad: In addition to product and hardware revenue, services revenue was significant to you, wasn't it?

Browne: Right.

Grad: You gave some figures the other day. Could you repeat them for the record here? I think that in 1983 you felt that services were a substantial part of revenue, and the margin on hardware was substantial as well.

Browne: I think the margin on hardware was not nearly as substantial. Even if we got 40 percent, it wasn't a substantial part of our revenue. If you look at it from a bookkeeping standpoint, it's a cost of sales.

Grad: It's a big cost-of-sales item. The other big cost-of-sales item is people. Did the revenue include the full price for the hardware?

Browne: Right. I'm not familiar with whether our revenue figures included the gross for the hardware.

Grad: I was going to look at that, because that was one of the big arguments we had in the industry. If you tried to make yourself look bigger, you included the gross revenue and the hardware, and had a very large cost of sales, whereas otherwise you put in only the net revenue, what you got as "commission," (let's use that word carefully) on the sale.

Browne: I believe that we always included the gross hardware revenue as part of our revenue statement.

Grad: Then it's a major part of the revenue even though it doesn't translate to bottom line quite that fast.

Browne: Yes, so that if people are looking at how to value companies to decide if big is better. Revenue is better.

Grad: You got a multiplier on the way the market looked with the multiplier on revenue.

Browne: Yes.

Grad: I used to use the tradeoff argument that margins looked lower and your return on sales looked lower because you had your sales up higher.

1984 – Sandy Kurtzig leaves ASK

Grad: I want to finish here with the 1984 period. Sandy somewhere around then made a decision to do something else because running ASK wasn't as much fun as it had been. This was 1984, I believe, a couple years after going public. Was she pushed?

Browne: Yes, this was 1984. I don't see that Sandy was ever pushed any of the times she made decisions. She made decisions for herself.

Grad: There was nothing that people were unhappy with, how things were going. It wasn't a, "Hey, we've got to make a change."

Browne: That's correct. I think there's a lot of pressure when you're a public company to make revenues, to have the stock go up, and it's easy to point to the person on top and say this person needs to go.

Grad: I was wondering whether that had occurred in the 1984 time period.

Browne: I don't believe that occurred in 1984.

Grad: I didn't think so, but I just wanted to make sure that you didn't see something different. Did any major new players come in prior to her leaving?

Browne: You mean major players in our market?

Grad: No, major people in the company.

Browne: Yes, Ron Braniff, who was on the Board of Directors, became president of the company, and I think that might have been in 1983 or 1982.

Grad: She brought in someone from the outside?

Browne: She brought in someone from the outside to be president.

Grad: How did the rest of you feel about that?

Browne: There were people who did not like that.

Grad: This is regardless of the person you bring in, sometimes insiders say, “Hey, why not one of us?”

Browne: There were people who believed that was the case. I was not one of them. I never aspired to be the president, but there were certainly feathers that got ruffled.

Grad: Did people leave when Braniff came in?

Browne: I can’t recall anyone leaving.

Grad: Ken Fox, for example, didn’t say, “Hey, I should have gotten that job”?

Browne: Ken Fox was at ASK five years.

Grad: So he stayed from 1981 through 1986 or so?

Browne: Through 1985, 1986. Not coincidentally, stock options vest over a period of five years.

Grad: Not surprised.

Browne: Ken Fox I’m sure would have aspired to be president. In her book, she talks about when she brought Ron in. If she had promoted Fox, maybe someone else would have been irritated. If she had promoted Lavey, maybe someone else would have been irritated. Bringing in Ron was her way of stepping back and trying to do something neutral.

Grad: That's commonly an argument: Promote one of the guys here and the others are all going to leave. So therefore I'll bring in somebody new, and they'll all be upset, but not upset enough to leave, in most cases.

Browne: Right.

1985 to 1989 – The Company and the Market After Sandy Kurtzig Left

Grad: So Sandy leaves. I'm ready to start to go to that next period of time. You're still there?

Browne: Yes.

Grad: You're still a VP?

Browne: I was still a VP.

Grad: A VP in development. You still reported to Ken Fox?

Browne: Yes.

Grad: Pretty good-size organization now, $30-40 million dollars in revenues and still growing rapidly.

Browne: Correct.

Grad: You port to DEC. What else do you port to during that period?

Browne: We didn't do any other ports. It was just DEC and HP.

Grad: You tried to port to IBM. Was that about that same time in the 1980s?

Browne: Yes.

Grad: Not successfully?

Browne: Not successful.

Grad: Who were your primary competitors in the early 1982 to 1984 time period?

Browne: There were a number of them, some of whom we acquired. NCA was a formidable competitor in the DEC world. Data 3 was pretty good in manufacturing in IBM's AS/400 mid-frame computer world. MAPICS was a huge competitor. SSA, was another huge competitor. BAAN had not surfaced yet. SAP, I don't recall their history, but they weren't significant at that time.

Grad: Which of them were on the HP 3000 platform?

Browne: I can't recall. We were the premier vendor on the HP 3000. There wasn't anyone else in the HP 3000 world, other than HP themselves. They had MFG 3000.

Grad: Was that significant?

Browne: They sold it. I mean sales people would bring that in and lead with it.

Grad: Did that affect your relationship with the HP sales people?

Browne: It did. It affected the relationship more with Sandy and the upper echelon of HP. She tried to convince HP that they should buy us or use us as their software, and Paul Ely refused to acknowledge that they couldn't build it themselves.

Grad: She mentions that in her book, I believe. She also mentions that other people there, before Paul Ely, were very antagonistic to the whole third-party software idea in terms of supporting companies like yours.

Browne: They were not going to depend on a third party who could also support competitive hardware. And they also had an NIH [Not Invented Here] syndrome.

Grad: Yes, so it was a combination of those things. Did you work directly with any of the HP executives?

Browne: Personally, I worked with Bill Richion in the early days as a sales person. I met Paul Ely but only in meetings. Lou Platt I met and was friendly enough to where I could say hello to him while he was walking through the halls at the HP conference with Carly Fiorina. But Lou I would count on. Ed McCracken I got to know real well.

Grad: Were you involved in negotiations during this period with any of those people?

Browne: I was not taken to the negotiating table. I was aware of all the negotiations, but I did not sit at the table. In the same manner I'm not a good salesman, I'm not a good negotiator.

Grad: ASK acquired NCA. Who else?

Browne: Data 3.

Grad: And MAPICS continued as a competitor. They were primarily, though, on an IBM platform, if I remember correctly.

Browne: Yes.

Grad: Because they got the old IBM COPICS ERP software; IBM picked them up.

Browne: Correct.

Grad: SSA, I don't remember what platforms they were on.

Browne: Initially they were on IBM's System/3 platform.

Grad: Being on the smaller System/3, IBM would have graduated customers up the chain to the AS/400, correct?

Browne: Yes. Everyone then tried to get into the world of UNIX. That was the Achilles heel for a lot of us.

Grad: That's what I was wondering.

Browne: That's later.

Grad: Did the competition at the low end of the IBM mainframe – the smaller System/360s and System/370s – affect you? Were they priced too high to cause you grief?

Browne: They were a different market. The people buying those computers weren't buying minicomputers, so I think there was a philosophical difference.

Grad: It was market differentiation. Continuing our focus on the period of 1984 to 1989: ASK was doing well. Sandy was out. Braniff became CEO, correct?

Browne: Correct.

Grad: Did he bring in a new president as well?

Browne: He was the President and CEO.

Grad: What happened during the first couple of years? You kept growing?

Browne: We kept growing. Braniff came from Tymshare. He had a sales orientation, so he built the sales force.

Grad: You were still leading the application development effort?

Browne: Correct.

Grad: Any significant changes in the kinds of products you were delivering? You're moving to ERP? What's happening during that period of time?

Browne: Yes. ERP is like MRP with financials. So yes, we're adding features right and left because we have more customers and more sales people. The number of things to do exceeds the capacity to do them.

Grad: Were any new acquisitions made besides NCA and Data 3? When were those made? When Sandy was still there or after?

Browne: Sandy was not directly involved in the NCA or the Data 3 deals. We acquired a company called Software Dimensions somewhere in the early 1980s. 1982 I think.

Grad: What kinds of products did they have?

Browne: They had a low-end PC-based accounting product.

Grad: So they were in fairly early if you're talking about the 1980s. Did you start to deal with PCs during this 1984-to-1989 period?

Browne: Yes, with Software Dimensions. They had a PC product.

Grad: So that's a separate line though.

Browne: Separate line, separate physical location. They're in Sacramento.

Grad: So you're not talking about porting to a client/server platform at that point.

Browne: No.

Grad: Was UNIX starting to become an issue. The RISC [Reduced Instruction Set Computer] machines were out there then.

Browne: UNIX was becoming an issue not so much from a technology standpoint but from a portability standpoint.

Grad: When did HP announce the HP 9000?

Browne: Oh man, I can't tell you that.

Grad: My recollection is that the man I worked for, Joel Birnbaum at IBM Research, then moved to HP.

Browne: Exactly, Joel went to HP.

Grad: Yes, and he brought the RISC idea with him.

Browne: Oh, he brought the RISC idea, right.

Grad: We tried to get IBM to do it. We couldn't get them to implement it, so my memory is that this has got to be somewhere around 1983, 1984.

Browne: Yes, they used RISC architecture in the HP 3000 eventually.

Grad: Yes, but the first one that had the RISC architecture, I think, was the HP 9000.

Browne: I think you're correct.

Grad: My memory is also that they did not necessarily use UNIX as the first operating system on the 9000.

Browne: I think you're correct on that one also.

Grad: But other manufacturers, such as DEC, put out their own RISC machine. IBM eventually did, but it took them a while to get there.

Browne: Correct.

Grad: HP was the leader. That is what my memory says.

Browne: They were the leader in RISC because of Joel.

Grad: I don't know if John Cocke went with them. He did the original mathematical work on the RISC designs. So in this 1984-to-1989 period, RISC wasn't an issue for you, correct? Were you investing money in supporting UNIX machines at that stage?

Browne: No.

Grad: Were some of your competitors starting to do that?

Browne: Yes.

Grad: You thought about acquiring QAD at some point?

Browne: Yes. I had a personal relationship with the people at QAD that I established through some other acquaintances independent of ASK. And I had always heard good things about not only their technology but their people. .I even came close to joining QAD in the 1985 time frame.

Grad: You decided not to go, for whatever reason?

Browne: Variety of reasons. Number one, Ken Fox retired from ASK. At that point, I think he had mentally left. He didn't like working with Ron Braniff. I was doing all the same work. I didn't think I was getting the accolades and/or monetary compensation that I should. You know, the sort of things that may or may not go into people's decisions.

Grad: When Ken left, you become VP of R&D?

Browne: Yes, I took over all the responsibilities.

Grad: So you were then reporting directly to Ron Braniff.

Browne: Correct.

Grad: Okay. When did you first implement MANMAN in a UNIX environment?

Browne: We never successfully made MANMAN work in UNIX.

Grad: You did not?

Browne: Not during my tenure, nor in any of ASK's history did MANMAN ever work in a UNIX environment.

Grad: Okay. So you were still basically in the HP 3000 and the DEC environments?

Browne: Correct.

Grad: What about the HP 9000?

Browne: The HP 9000 wasn't a target for us.

Grad: So these were basically the two machines you supported. Did you support DG [Data General]?

Browne: No.

Grad: What changes in the climate – either in the market or inside the company – occurred in the 1987, 1988, 1989 period?

Browne: Well things were changing. Sandy came back from a hiatus.

Grad: But not until 1989 is what she wrote, I believe.

Browne: Yes.

Grad: Why did she come back? She wrote in her book that she was disappointed in what was going on in the company and things weren't satisfactory. Whether that's true or not I have no way of knowing.

Browne: That's all possible. Ron Braniff was still president. She fundamentally believed

that we weren't taking advantage of the next generation of hardware. She'd been playing with the Macintosh.

Grad: So you weren't moving ahead into the client/server environment that utilized large machines and PCs. Is that what you're saying? You were the VP of R&D. You must have been looking at these kinds of opportunities.

Browne: Not really. I mean I was an applications guy. So I was not spending time looking at hardware or even operating systems. I was trying to solve business problems that manufacturing companies were having. I didn't see any technology that would fundamentally help us solve the business problems in manufacturing companies.

Grad: Had the company growth continued through the 1984 through 1989 period?

Browne: Had it continued? Oh, it had accelerated. Yes, it was huge.

Grad: Was Sandy still a significant stockholder after she had left the company in 1984; do you know?

Browne: I don't know. At some point she got down to less than 5 percent.

Grad: I believe she had gotten rid of most of her stock.

Browne: Yes.

Grad: Interesting. Were you involved in any way in her coming back? Were you talking to her and approaching her?

Browne: Oh, yes, I was talking to her. I introduced her to Karl and Pam Lopker from QAD after I had a job offer from them. They were up at my house around Christmas time. We were just doing a little social thing. I invited Sandy and introduced her to Pam and Karl and said that they were my new bosses.

Grad: This was in what time period?

Browne: 1989, whenever she came back.

Grad: And what happened then?

Browne: She told me out on the deck, out of ear shot, not to do anything, that she was coming back and please don't do anything.

Grad: So you hadn't known she was coming back at that point?

Browne: No, I didn't know she was coming back.

Grad: That was a surprise?

Browne: Yes.

Grad: How did she get back? That's an interesting question. How does someone get back into a company when they only have a small stock position?

Browne: She knew the board of directors. I think she may have bought back a fair amount of stock. At that point it was trading at $5 a share.

Grad: She claims she owned up to 9.7 percent at one time.

Browne: When she came back?

Grad: Yes. There's an article about it.

Browne: When we went public, she owned 98 percent. When she left, she sold all but 5 percent. She probably bought back enough to get about 9 percent.

Grad: Was this basically the board of directors approaching her, do you know? Do have any inside knowledge on that?

Browne: She had communication with the board.

Grad: Well, my question is whether they were the ones that were unhappy with the performance of the company and with Ron or whether she was going to them and saying, "Hey, I think I can do better. What if I come back in?"

Browne: It's probably a combination of both.

<u>Kurtzig Returns to ASK – 1989 to 1994</u>

Grad: Let's talk about the 1989 to 1994 period. Sandy returned. What changes took place?

Browne: Well, a number of things changed. There was a gentleman that was sort of my contemporary in terms of he came from NCA and was a vice president.

Grad: Okay.

Browne: He was working on the next generation. Ron had put him in charge of the next generation software product. So, one of the first things Sandy did after returning was to ask this vice president to leave the company.

Grad: What happened with the next generation product?

Browne: She and I had a number of discussions. I had a different viewpoint than she did. She also embarked on doing some negotiations, looking at Oracle and eventually buying Ingres.

Grad: When did the Ingres purchase take place?

Browne: **19**90 or 1991

Grad: 1991 sticks in my mind.

Browne: Yes.

Grad: So you were not building a next generation, but I thought that her interest in the client/server world would have had you working on a product in that area.

Browne: There was work being done on the next generation product more from a research standpoint – on what will be the tools, the databases, the machines? She was enamored with Apple's Macintosh. If you remember, in those days, Microsoft Windows wasn't on the market.

Grad: I think Windows 3.1 didn't really succeed until about 1989.

Browne: And they didn't have a graphical user interface. It was still character-based. Graphical user interface was more in the area of Motif X Windows, which required a fairly expensive workstation, about $5,000 to do the true graphical kinds of things. We had taken MANMAN into forms. We had forms but they were sort of cumbersome to use. HP View was a forms package.

Grad: So, what different opinions did you and Sandy have as to the direction things should be going?

Browne: They weren't so much personnel decisions, although there were some people that worked for me whom I trusted but Sandy was impatient with. She liked to have things happen fairly quickly. I didn't see anything on the horizon that would allow us to re-create MANMAN in UNIX. Progress was pretty damn good, and we could have done it, but that would have been stupid. We should have just acquired QAD. If we wanted a process-based manufacturing system, we could have had a company and a customer base – it was called QAD. I thought acquisition was probably better than trying to build it ourselves. She believed the tools were there to build our own, and it could be done quickly and cheaply.

Grad: A question I should have asked you: you had been using Image. Did you at some point switch over and start using Ingres?

Browne: No.

Grad: You weren't using Ingres as a database for MANMAN by that point in time?

Browne: Correct.

Grad: I thought one of the reasons for acquiring Ingres was to provide you with a database source that you could use in the program.

Browne: That is not correct. If we had tried to use Ingres, or tried to use Ingres tools, it might have changed our opinion of buying Ingres. But it wasn't until we bought Ingres and were sort of forced to use their tools that we learned that. Sandy would disagree with me on this one.

Grad: Okay.

Browne: She'd disagree with me that the tools weren't available with Ingres. But they were not available with Ingres. We had no product and no development effort on Ingres when we acquired Ingres.

Grad: Thank you. That very specifically contradicts an article which you sent me that says the opposite; it discusses the battle between Joe Lenane and Curt Sickus as far as control of the company.

Browne: Correct.

Grad: In it they quote Sandy as saying the reason she needed to buy Ingres was that ASK's products were using that as their database and they needed to protect themselves in the future so that no competitor would buy Ingres and block ASK.

Browne: That statement that you just referred to is untrue.

Grad: Okay. Thank you.

Browne: But Sandy may have believed that. From a technical standpoint, MANMAN did not operate on Ingres. Now I'm going to back up a bit. There's the BAAN Corporation. At some point in time we resold the BAAN software. The BAAN software might have had the ability to run on Ingres but it wasn't its primary database. In fact its primary database was sort of an indexed sequential file system. Ingres didn't lend itself to indexed sequential files. And Informix was probably a better choice for indexed sequential files. There was also Sybase and Oracle. So there were four database companies.

Grad: Yes, you had lots of choices. It could have been said that it was very risky to support only one, although it turns out that if you supported Oracle, in the long run, you would have been okay. But no one could have predicted that, I don't think, at that point in time.

Browne: Right. And you could support it low level with ODBC, although it hadn't been invented then.

Grad: Well, 1991 was not a good time for Oracle in terms of its business. It practically went out of business. Sandy has returned and you two had some differences of opinion, but you still continued working there?

Browne: Correct.

Grad: You dropped the plan of going to QAD because Sandy wanted you to stay?

Browne: Correct.

1994 – Browne Leaves ASK

Grad: What happened then?

Browne: I officially resigned in September of 1993. My last day of work was January 15th, 1994. And it's not coincidental that this was my last option date. All my options vested January 15th, 1994.

Grad: You did a five-year option period or four?

Browne: Each. I got granted options at different points. That was probably my last five-year or four-year.

Grad: You resigned?

Browne: Correct.

Grad: Why?

Browne: The writing was on the wall. Sandy had brought in a guy named Pier Carlo Falotti from DEC to run the company. She also brought in a gentleman whom I liked a lot, respected a lot, by the name of Eric Carlson, and also a woman whom I liked and respected and we're still friends, Amal Johnson. I think Amal came in first, but I had a conversation with Eric. Eric was running Ingres. He was running ASK. I'm not sure where Pier was. He didn't spend much time at Ingres or at ASK, but I think he may have been a player. Eric and I had a discussion about Amal coming in. He didn't know whether he was going to stay. There were at that point 14 vice presidents. We had already acquired Ingres. He said that if there's anything he could ever do for me, this was the time to do it, so we established a date and a severance package and I went for it. Not coincidentally, my grandmother died, my father almost passed away, and my mother died – all within in a two-month period.

Grad: Oh.

Browne: So there were a lot of family things I had to deal with in Oregon. Leaving gave me a great deal of freedom to spend time in Oregon without having to spend time with the mess that had become ASK.

Grad: I gather that Ingres coming in was a problem

Browne: It was the beginning of the end.

Grad: An unmitigated disaster?

Browne: Correct.

Grad: Ingres itself had its own problems, and apparently it didn't solve ASK's problems; is that a fair statement?

Browne: Both of those are excellent statements.

Grad: Did you work on anything memorable or significant during this time period – from 1989 to 1994?

Browne: Yes, one of the things that I was always working on in the back of my mind was figuring out what tools would allow us to re-create MANMAN in a UNIX environment or a graphical environment. I investigated Cooperative Solutions. By that point, I knew a fair amount about Windows 4GL. I knew a lot about Progress and QAD. So, most of the things that did not translate into products for ASK, the things I was working on, I was looking for the Holy Grail, the next generation.

Grad: And did you find it?

Browne: Well, I found a company. Do you remember dBase?

Grad: Of course.

Browne: dBase was acquired by Borland.

Grad: Yes.

Browne: And in my latter days at ASK, I ran into a company called StarBase, and StarBase had the original developers of dBase.

Grad: Oh really?

Browne: They had a project to re-create dBase Windows. But Borland had a product called Paradox, and they decided to ride Paradox rather than dBase. The dBase people created their own company called StarBase.

Grad: Ah. We have had interviews with a number of those players who were involved in that interesting story. So StarBase is really the original dBase people?

Browne: Correct. These were some of the original Ashton-Tate guys. Ashton-Tate was acquired by Borland.

Grad: Yes. There's a horrible story about how that occurred. Ed Esber had been the president. We have an oral history in which he discusses that process; it was not a happy process.

Browne: Bill Stowe was the gentleman who founded StarBase and who was my boss.

Grad: Okay. You jointed them in 1994.

Browne: My mother had passed away, my grandmother had passed away, and my father came out of his coma and lived another year. You know, one of the regrets I have is that I didn't spend more time up in Oregon with my father. He lived another good year.

Grad: Did you consider moving back up there?

Browne: Not for that. I had a young family. We were all scared of economic insecurity. I thought that if I didn't have a job, things would go to hell in a hand basket.

Grad: So even with the separation package and your options, you still felt that that you were at economic risk?

Browne: I think that, as we speak, economic risk is always right around the corner.

Grad: Interesting. I grew up in the Depression so you can understand why I would feel that way. But you did not.

Browne: No, I grew up not in poverty, but my dad imparted to me the importance of working hard and earning money.

Grad: Of course. Okay, you stayed with StarBase for a couple years?

Browne: Yes. I ended up with a small office in downtown Los Altos. They never got their vision together to be able to create a package that I could use to create MANMAN or do anything useful with. I built my business with StarBase somewhat independently by having my own office, and so I created my own company called Manufacturing Software Solutions.

Grad: You were still an employee of StarBase?

Browne: No, I separated from StarBase. I purchased the computer equipment. I had the office. I took over their employees that worked for me. So I just basically took that arm of StarBase and formed my own company.

Grad: So actually you were only with StarBase for a little over a year.

Browne: Correct.

Grad: What happened then?

Browne: One of my consulting engagements was with a startup company called Calico Technology – one of the early dot.com companies. So I merged my company with them, which meant I took a couple people and the computers and joined Calico.

Grad: They gave you some stock options or some stock for coming in?

Browne: I was smarter this time. I negotiated stock before I joined the company.

Grad: Smart. You were there for a couple of years?

Browne: Correct.

Grad: What happened with the company and yourself there?

Browne: The company took a number of different directions. It was VC-backed, so things happened more quickly with that kind of company. Management changed, the original president was ousted. There was a lot of turmoil. I was the last of the original VPs.

1998 – Browne Forms Skyline Consulting

Grad: And then you did something that I think was quite interesting. You became a principal in Skyline Consulting.

Browne: Correct. I created a business card and a consulting business.

Grad: Were you Skyline Consulting?

Browne: I was the sole proprietor and the only person associated with Skyline Consulting.

Grad: Okay. You said you were a principal, but if it was your business, you were going to do it your way.

Browne: Yes. I didn't know what else to call myself. I didn't want the title of president or CEO.

Grad: Was your intention to help other companies over rough spots and be their interim chief information office [CIO] or did that role just evolve?

Browne: It evolved from 1998 through what I'm doing today.

Grad: One of my friends [Bruce Coleman] would come in and be the chief executive officer of a company when they were unhappy with their previous one. He'd come in, but he was clearly interim. He was going to be there for three to six months. He said he'd either bury it or he would find them a new executive.

Browne: Ironically, two of my buddies from ASK came in at the tail end of Calico and were running Calico before it was acquired.

Grad: Did you enjoy doing that sort of thing, coming in, working for a relatively limited time with a company?

Browne: I enjoy small companies. I enjoy that very much, yes.

Grad: What would you do? Train someone to take over the responsibility? How did that work?

Browne: In most cases, I operated as in interim VP of engineering. Engineering is really my background. I understand software. I understand people management. I understand products to the extent that companies need customers and feedback.

Grad: But as an interim VP, you took the job knowing that someone else was going to take over at some point? Did you recruit your replacement? What did you do?

Browne: In one case, I tried to help recruit my replacement. I also joined a company called Core Technology as a full-time employee for a while.

Grad: That's on your list. Yes. So this keeps you going for about four years. Did you make a living?

Browne: What years are we talking about?

Grad: 1998 to 2002.

Browne: Yes. I had enough vestiges of my stock portfolio.

Grad: Was your consulting practice a self-sustaining practice during those four years?

Browne: I made money, yes. But if you're asking, did I make enough money? You never make enough money.

Grad: Your family was growing up at this point.

Browne: Yes. Sure.

Grad: So your costs were going up.

Browne: Yes, I've got both kids in private school and my wife is working part time.

Grad: Costs increase considerably as they get older.

Browne: Yes, I know that only too well. I also had a house fire in 2001. My house totally burned to the ground and I lost every physical possession I had.

Grad: How traumatic.

Browne: So for about a year and a half I did nothing but work with the insurance company to document and just try and get as much back and try and rebuild the house.

Grad: What a terrible thing. Very quickly, then, a last couple of items. What's MS2?

Browne: MS2 is a company that ironically was housed in the seventh floor of the original ASK building. It is a software company and not coincidentally Tom Lavey was their VP of sales. We called that time the nuclear winter here in Silicon Valley. No people were buying software. I operated as a salesperson and I probably talked to a hundred different companies. I guarantee not one of those companies bought software. It was one of those cases where they eventually had to be acquired.

Grad: Pretty lean. What was Menlo Park Research?

Browne: Menlo Park Research was a joint venture between a good friend of mine Mark Ripma who lived in New Zealand and myself. I operated here and we tried to help New Zealand companies get a foothold in the United States.

Grad: And you didn't succeed?

Browne: We didn't have much luck with one of the software companies we worked with, but Mark worked with another venture called SoftTech that's still in existence over here. But the success of trying to get into the US software market from a place like New Zealand is not easy.

Grad: Surprisingly enough, a number of Israeli companies have been fairly successful at doing that. But there haven't been very many exceptions that have moved from Europe or Asia. Notable exceptions are SAP and Software AG.

Browne: Yes I've been doing some pro bono work with Mexican innovators. I've talked to a number of Mexican companies. But what it takes to do products is much more. It's different here in the US.

Grad: What is VP Armus?

Browne: Armus is Software as a Service for the medical field. We have about 40 to 50 hospitals throughout the United States.

Grad: What kinds of applications?

Browne: It's for cardiac surgery, including the post surgery collection of information about patients, such as whether the person's a smoker, other demographic information, the kind of surgery performed. The data is collected centrally at Duke University. There are about 800 people who feed data into it. We're just one of those companies that helps people collect that data.

Grad: Who is paying you?

Browne: The hospitals pay Armus Corporation to use the software to insert data into the database.

Grad: Well, it sounds like you're still a very busy man.

Browne: I'm busy, yes.

Grad: What is your personal family situation at this point?

Browne: One of my two kids has graduated from a small college in North Carolina called Davidson. And my son is a junior as UC Davis. This is my second marriage. No children from the first. And I'm celebrating my 25th wedding anniversary this summer.

Grad: Congratulations.

Browne: We rebuilt the house. So I still live in the same place. And my wife is a now a full professor at Skyline College in Pacifica.

Grad: That's terrific.

Browne: That allows me more freedom to do of my work with Armus and I owe a lot to her.

Grad: Kids being away from home too gives you a lot of flexibility.

Browne: Yes, my daughter's in Washington, D.C. and works for corporate America. But she should be out here soon, and my son loves Davis. We'll be seeing both of them in the next few weeks and we're all going to Mexico as a family.

Grad: That's wonderful. Thank you so much for the time you've spent with us.

Browne: Well, I can't tell you how much I appreciate what you've done, allowing me to express myself. It's just been a joy to talk to the people I haven't seen in years.