Thomas E. Kurtz

Professor of Mathematics and Computer Science, Emeritus

An Interview Conducted by

Daniel Daily

Hanover, New Hampshire

June 20, 2002
July 2, 2002

DOH-44

Special Collections

Dartmouth College

Hanover, New Hampshire

INTERVIEWEE: Thomas Kurtz

INTERVIEWER: Daniel Daily

PLACE: Hanover, NH

DATE: June 20, 2002

DAILY: Today is June 20, 2002 and I am speaking with Professor Emeritus Thomas Kurtz. Professor Kurtz, one of the first questions I would like to ask is what brought you to Dartmouth and specifically the math department here?

KURTZ: It was primarily the attraction of the geographical area. I was a graduate student at Princeton and, incidentally, at one point I lived less than a block from the Kemenys [John G. and Jean Kemeny], but I didn't know them down there because we were in different spheres. I think by that time he was a junior faculty member of philosophy and I was a lowly graduate student in mathematics.

                 At any rate, in the summer of 1955, my first wife and I and our family came up to Hanover to visit people who we knew down at Princeton, particularly Bob [Robert] and Anita Norman who had moved up here. He had taken a position in the math department -- or was here for the summer at least -- and [J.] Laurie and Joan Snell, whom we knew quite well at Princeton.

                 So we came up and spent a week…I don't know…and thought, "Gee, this is a lovely part of the country." I had previously thought, "Well, obviously I am going to go out west where men are men and women are glad of it type of thing in the mountains."

                 Then, I think it was about March of the year I was scheduled to finish my degree at Princeton and I had mentioned something about wanting to go to Dartmouth because one of my friends had said that Kemeny was in town recruiting. So I made an appointment with him and got an interview and I was recruited as a statistician because I was doing some graduate work in statistics at Princeton at the time.

I know for a fact that I was Kemeny's second choice because a very good friend of mine, David Wallace, who since has gone on to the University of Chicago, was his first choice. I know that. Wallace was, at that time, an instructor at MIT. Many faculty members, you know, they go to an institution for a couple of years. So, at any rate, I got into the mix and I got hired and naturally I accepted. This is a gorgeous part of the country up here. That's how I came…nothing to do with the math department per se. I didn't know that much about Kemeny, but just the opportunity to live and work up here seemed attractive. You know, a bird in the hand -- namely a job offer from Dartmouth -- is worth two in the bush. So that's how I came up here.

DAILY: Your first couple of years here, who made some of the deepest impressions upon you in terms of both the math department and around campus?

KURTZ: Well, I knew very little of the higher ups at Dartmouth. Of course, Kemeny was a very unusual person…if you have ever looked into it or maybe heard some of his tapes. He really cared just about as much as anybody could care about the people who he worked with, so I just always worked with Kemeny. He was my, you know…I wouldn't say "mentor"…that's not quite the right word, but, you know, he was chairman of the department, so that was natural. I just don't remember my impressions of anybody else at Dartmouth at the time.

The math department was in the top floor of Dartmouth Hall at the time…a place that has subsequently been taken over by I think the Russian department…I am not sure. They move around anyhow. This was before the Bradley Center was built. I think that was in 1962, something like that.

I remember some early stories about Kemeny. At that time, when I came, B. H. Brown [Bancroft Huntington Brown] was just about ready to retire from the math department. Fred Perkins [Frederick William Perkins] was one of the remaining people who had still not retired. Incidentally, I can add a little bit to how Kemeny came to Dartmouth, which I will in a minute.

At any rate, the first faculty meeting that Kemeny attended in the math department was at the third floor in Dartmouth Hall. He wasn't chairman yet. I think this must have been in 1954, his first year here. He had been hired and then he took a sabbatical as part of the deal and came up here. So he was sitting in the math department. He raised the issue that we needed to hire a secretary in the department and somebody said, "Well, I don't think we really need a secretary." (I wasn't there, by the way.)

"When we have a paper to type, we take it down to Mrs. So and So or Mrs. So and So and they type the paper." They asked, "When will you have a paper ready for her to type?" Kemeny said, "I have three right here." [Laughter] Whereon B. H. Brown -- the little droll fellow -- apparently rolled his eyes, rolled his head like this and said, "There are going to be some changes around here." [Laughter]

DAILY: That kind of gives the impression that the math department wasn't particularly research-oriented at that point?

KURTZ: It wasn't research-oriented. In fact, the story was that, about 1952 or '53 or something like that, Don Morrison [Donald "Don" Morrison] was dean of faculty and then he was provost, of course, and… By the way, Kemeny thought extremely highly of both Morrison and Dickey [John Sloan Dickey '29]. Dickey brought the institution into the twentieth century. Hoppy's [Ernest Martin Hopkins '01] Dartmouth was a holdover from the nineteenth century, no question about that. You know, a nice little exclusive men's school up in the boonies. Dickey really brought it into the twentieth century.

At any rate, the math department was nearing, in a block, retirement age. A whole bunch of guys, who had been around for many, many years were close to retirement. These included for instance Robin Robinson [Robin Robinson '24] who just died earlier this year. He was appointed I think in 1928. If I've got the years right, I think he graduated from Dartmouth in 1924, graduated from Harvard in 1928 and served until, you know, he became registrar. He never really retired.

At any rate, there were a whole bunch of these guys and I can't recite their names anymore in complete detail. So Don Morrison, and I don't know if he was dean or provost at the time, but what difference does it make because before there was a

provost, the dean would have done all of this anyhow. So he was wondering what to do about the math department. What should he do? So he arranged for an outside committee to come in -- you know, kind of a review committee or something like that. I don't know who was on it.

At any rate, so the story goes, they looked at the department and wrote a report that the Dartmouth math department ought to concentrate not in research but in something like the history of computing -- not of computing -- the history of mathematics. Don Morrison figuratively speaking said, "Thank you very much" and dropped the report into the wastebasket. [Laughter] But Don Morrison was a very good friend of Al Tucker [Allan "Al" Tucker] of Princeton and Al Tucker was probably chairman of the department then. I was a student down there at the time and I was a student from 1950 to '56. He said to Al Tucker, "Do you know anybody? I need a good person to come up and revitalize the math department." Al said, "I think I know somebody." It was, of course, John Kemeny. At the time, he was an instructor in the philosophy department because his main field of mathematics was philosophy of science and logic, but later got interested in probability. He and Jean felt that was going to be their life. They were going to do their academic career at Princeton. You know, have a nice comfortable life down there. So Morrison came down. I think he must have come down to Princeton because it is hard to get somebody from down there up here unless you go down there and grab them by the neck…[Laughter]

DAILY: And put them on the train.

KURTZ: Right. So he [Kemeny] basically got carte blanche to hire anybody he wanted. I don't know who else was there. This is '53. He said he would do a sabbatical. "Okay, fine. You can have your sabbatical." So that's how Kemeny came up here.

DAILY: Okay.

KURTZ: A fascinating story.

DAILY: So about how many members were there in the math department when you got here?

KURTZ: I don't know. A dozen, maybe.

DAILY: Okay. And John Kemeny obviously kind of…

KURTZ: By the way, it was the department of mathematics and astronomy. There were two astronomy guys – George Dimitroff and I forget the other name. I remember Dimitroff. You know Dartmouth had a little astronomy activity all through the years. The reason they were in the mathematics…because at one time at an earlier age, the physics department didn't want them. Then, at a later time, the physics department became the department of physics and astronomy. But at that time, it was math and astronomy. So who wants these two astronomers? [Laughter]

DAILY: They kept moving the poor people around. I guess one of the things that I am curious about is how the shift in the interest grew in the math department for computing and how you were kind of brought into that.

KURTZ: Well, how we got into computing and how the math department got into computing…okay. First of all, I wrote my first computer program in 1951, after my first year of grad school at Princeton. I used to tell people that and Kemeny used to respond, "Well, I wrote my first program in 1946," just following the Second World War. And he worked with computers during the development of the atomic bomb at Los Alamos. There are some wonderful stories about his active duty at Los Alamos, but I won't repeat those because I am sure they have been reported elsewhere.

Incidentally, Kemeny was in the process of writing his autobiography when he died and his wife and daughter Jenny read it and they said, "It's wooden. It's not you." But nothing was done about that and then Jean said she was going to get Michael Dorris [Michael A. "Mike" Dorris] to help her rewrite it. Then Michael Dorris died. So I don't know that anything is going to come of this; but there is a draft of Kemeny's autobiography lying around in Kemeny's house somewhere.

DAILY: There is a project…Both Jean and Jenny [Jennifer M. "Jenny" Kemeny '76] Kemeny are working with a guy down in New York -- I am going to blank out on his name right now -- to get a book, a biography, published.

KURTZ: Is that current?

DAILY: Yes. That's afoot right now because we have been contacted.

KURTZ: Well, Jenny is quite an aggressive person and I am sure if she got involved in the project, she would do something with it. Well, that's good because the stories that used to go around…John used to tell us stories when he was…We had department parties in very small apartments. We would sit around in somebody's living room. We wouldn't have to go down to Jesse's or some place. We heard some of these stories.

But, let's see, back on track. Even though I got my degree in statistics, I was interested in computing and, had computing been around at the time, I probably would have gone into computing.

John was very eclectic in his views. He was more of a generalist in mathematics than he was an expert in some particular field. He had a degree in logic. He worked with Church [Alonzo Church] at Princeton on philosophy of science. He wrote some books on philosophy of science. He later got interested in probability, but he was never what you might call a pure mathematician.

So, okay. I get hired and I come up here. My first wife said, "This is not enough money." I had to take a pay cut from being a graduate student to come up here. Well, that was an eleven-month appointment versus nine months. So I went to John and as it turned out by coincidence, just at the time, IBM was setting up computer centers at MIT and at UCLA to feature IBM machinery and also to promote computing on campuses. That was in 1956 that they were setting up this project.

Now at MIT what they did was to provide -- they agreed that they were going to provide -- it was a ten year deal, so they were committed for ten years to this. They would provide their best hardware to MIT. MIT would build a computer center appropriate and MIT would get the first shift and IBM would get the third shift -- or something like that -- and then the second shift… These were these machines, you know, that were called batch processing. You put a card deck in and so forth. So shift meant something because when you had access to the machine, you had access to the whole machine. As part of the

third shift -- I don't know whether it was the third shift or the second shift -- was to be used by colleges and universities of New England.

IBM provided funds to establish…typically, it would be a graduate student in mathematics to act as a liaison with this project at MIT on their own campus such as at Brown or Yale or whatever. This was indeed the case and so Kemeny… and John McCarthy was here at the time, too. He has since gone on to be one of the most famous artificial intelligence guys in the world. Most of his later career was made at Stanford.

At any rate, so I think McCarthy contacted MIT and it was agreed that I would be the liaison for Dartmouth. Because I was a faculty member, I was named a research associate rather than a research assistant…but it amounts to the same thing. My job was to promote that thing on the campus. I don't know if I ever taught a course or anything and then, as people would write programs at Dartmouth, they would punch them up on cards. We had keypunches because the accounting department, the controller's office, had an IBM setup…a printer with keypunches and stuff like that.

DAILY: You would create the card.

KURTZ: Yeah. All mechanical stuff. So we had the key punches and people would write programs. Then I would carry them down in a steel box, catch the 6:20 out of White River, get into Boston around 9:30 and take a cab to go to the MIT campus or something like that, submit the cards...and they would go in. I think I got turnaround the same day, so it didn't -- so when they said second or third shift, they didn't mean exclusively. Somehow I got service, at any rate. At the end of the day, I would pick up a bunch of listings that were the result, which are usually error reports. Then I would cart these back to Dartmouth. Every two weeks I did this.

So we got involved. I got involved and Kemeny was involved, too, because what he did -- at that time, it was before FORTRAN. I don't know how much you know about computer languages.

DAILY   A little bit about FORTRAN.

KURTZ: That was before FORTRAN. FORTRAN came in the 1957 school year, but that year -- in '56 -- we were writing programs in what was called "assembly language". So John Kemeny devised -- he was full of ideas -- full of ideas -- a way to try to simplify assembly language programming for non-experts like faculty members. He said, "If you wanted to add numbers together -- suppose you wanted to do A + B and put the result in C, here is what you did." He would provide a template. Floating load A, floating add B -- this is assembly language -- floating store C." He said, "Just do this and then here is your A, B and C." So he tried to simplify assembly language programming in that way.

Well, you know, it wasn't that great an idea and, besides, the next year we got FORTRAN, so we didn't have to do that anymore. So we got a start in computing at Dartmouth right in 1956, plus the fact that the summer of 1956, unbeknownst to me, there was a conference at Dartmouth that McCarthy had organized to study the -- how did they put it? Well, I can't remember what the purpose of the conference was in words, but it was at… When he wrote the grant proposal to get money for it, he coined the phrase "artificial intelligence" as being, you know, learning machines and things like this.

So that was the first time that people came together in one place to talk about this stuff. All of the famous forerunners of artificial intelligence, McCarthy, Minsky [Marvin Minsky] and all of those guys were here for one or two weeks. It was a six-week thing in the summer and, unfortunately, most of the written paper work record of this conference is gone.

DAILY: Oh, really.

KURTZ: Yeah. So we would like to have it; but, you know, it was just a bunch of people meeting. Simon [Herbert A. Simon] and Shaw [J. C. Shaw] from Carnegie and people like that and they were talking about their work. So there was very little written record. There were no papers presented, to my knowledge. There must have been a final report to the Sloan Foundation, but I have never seen it.

DAILY: I will take a peek for that and see if it is around here.

KURTZ: Oh, did you know…there is another thing about Dartmouth and computing. This is going to take several hours for the background. [Laughter]

DAILY: This is great.

KURTZ: In 1940, George Stibitz [George R. Stibitz] -- do you know the Stibitz story?

DAILY: I have just heard the name and the connection slightly.

KURTZ: Okay. George Stibitz worked at the Bell Telephone Laboratories, which was then on West Street in Manhattan. He was kind of a maverick guy, too. One of the things that he did was he took the -- you know -- the telephone circuitry used these rotary switches -- when they introduced dialing, they used rotary switches. He figured that was one digit. Right? One digit. He put them together to form a computation machine…a calculator is basically what it was -- a mechanical calculator. I forget whether it dealt with…it could have dealt with complex numbers because he was an engineer and complex arithmetic was something he would be interested in.

                I don't remember whether it was complex numbers or ordinary garden-variety numbers, but since he was at the telephone company, he used a model 27(?) teletypers -- the old machine -- to access this creature. So it turned out that in September of 1940, he gave a demonstration of this with the teletype machine at McNutt Hall connected down to the machine at West Street.

                According to what I've read, *The Boston Globe* reported "lightening like speed". It took twenty seconds to do a multiplication, but that is the first recorded in history use of "remote use of a computer". Stibitz came up here later when he retired from Bell Labs and worked at the Medical School. He just died about two years ago.

DAILY: I knew I had seen Stibitz and that McNutt Hall thing a while ago.

KURTZ: Fascinating stuff.

DAILY: So you and John Kemeny were interested in computing and then McCarthy. . .

KURTZ: When I got here…I don't know if McCarthy left here in '56, '57 or '58, but he went to MIT because of the computer. He wanted to get direct access, not by train, to a more powerful computing machine because he was beginning to develop his ideas on how to do artificial intelligence projects. The first result of that was he invented the LISP language. He didn't do that here.

DAILY: So how were the older faculty members kind of reacting to all of this? Were they interested in computing? Do you have any recollection of that?

KURTZ: No. I am just trying to think what I can usefully say about this. Because there were very few people who were using the computer before we got our own thing in 1964. So the ones that used it, fine. The ones that didn't use it…

           But I do remember one meeting and I don't know when it took place. The economics department had invited Vasily Leontief, the famous economist who invented a mathematical model of the economy of a country or whatever called "Input, Output" model. They invited him up to give a talk and I said to…I don't remember what the year was and I said to somebody in the economics department, "Gee, why don't you invite the students? This would be perfect to invite the students to this." We, in the math department, didn't protect our students from ideas. They said, "Because the faculty are afraid the students know more than they do…or smarter than they are." So there was a lot of that in those days. A lot of protective tariff type of thing. But I don't know anything like that in computing because the people who weren't interested didn't show up.

           Later, when we started the Dartmouth timesharing project ["DTSS"], of course, I can tell you several things. Because Dartmouth time sharing was communications driven, they could put the teletype machines anywhere they wanted on campus and use existing phone lines to connect. That was no problem. That served to break the barrier because people didn't have to… Let's say a faculty member in some humanities department, didn't have to go over to somebody else and demonstrate their ignorance by not knowing the jargon or something. The thing would come to them. They would go in and close the door and type away on the computer, making whatever mistakes they felt like making without feeling being condescended upon. So that was an important part of that.

Another aspect of that was that Kemeny made sure that the faculty knew about the Dartmouth time sharing system -- this was Kemeny again -- a great man. It started in 1964 in May. We got our first actual run of the thing and in June he gave a series of lectures -- maybe it was one lecture -- with live demonstrations in Filene Auditorium to faculty members. This is what the new world is going to be like, something like that.

So that was good and another thing that I can tell is that, of course, the students latch onto something like this, no problem. They aren't afraid of making mistakes. Bang. Bang. Bang. We had -- the teletype paper is yellow, it is on a big roll -- yellow paper in those days. This yellow paper appeared all over campus. I remember at the engineering school, the faculty member said, "The students keep turning in their homework with this yellow paper. Something is going on here." [Laughter] "I'd better figure out and learn what it is."

DAILY: That is one of the things that interests me -- or two strands going here. One is that the students were involved in computing -- I mean, actually developed, from what I have read, helping you and John develop it at the beginning -- and I am just curious basically how that came about.

KURTZ: Well, it came about very naturally. One of the things that John Kemeny did in trying to build up the math department was try to recruit students. He worked as hard to recruit math students as [Robert] Bob Blackman did to recruit football players. He would go around to high schools. He made an annual trip down to the Bronx High School of Science to deliver a talk and try to get some of those kids to apply to Dartmouth and many did. So we had very good students. In fact, back around 1959, '60 -- something like that -- he had instituted an honors program in mathematics to provide for slightly more advanced courses, you know, to provide something for these students to, you know -- something more interesting than the ordinary courses. That's how he pitched it to the people. So we had enormously bright students. I don't think, on a percentage basis, that it has been seen since. I don't know if this is a little later -- it might be post Sputnik -- or Sputnik was '58, wasn't it?

DAILY: Right around there.

KURTZ: I came up in '56, so it would have been about that time, post Sputnik, and there was money from the NSF [National Science Foundation] to provide fellowships, not fellowships, but assistantships and so on. So we had tons of extremely bright students in mathematics -- many of them majored in mathematics. Okay. 1956…I came here and we used the computer at MIT for three years. Then the department was going to get a new building. It was in the works. I think that's right. Yes. Okay.

So Kemeny decided we needed our own computer. So we looked around and I did a lot of the looking. He was the one who had the idea and promoted it and I was the one that…we had a perfect relationship. So I looked around and we picked a computer that was pretty widespread at that time called the LGP-30. So we decided to buy it for Dartmouth and what Kemeny did was brilliant.

He went to Don Morrison, the provost. This was before Don died. Don died a few months later, as a matter of fact. He went to Don Morrison and said, "We need $40,000 for this beast." It wasn't in the budget, right? But they were planning the new Bradley Center named for Bradley [Albert Bradley '25], who was chairman or something at General Motors who went to Dartmouth. He was a protégé of Alfred Sloan, I think…Alfred Sloan of General Motors. Albert Bradley was his name. So there was this project but there was a fund…part of the funds for the project were for equipment…you know, desks and things like this. So Don Morrison said, "Okay. This is equipment." So we got the money. We went down and bought the machine. I think we brought it back in the tail end of our station wagon or not, but I remember John and Jean Kemeny went down and I and my wife went down and we signed the contract. Then we went to dinner afterwards and stayed at one of those hotels that no longer exists.

DAILY: Now what company did you buy this from?

KURTZ: It was Royal McBee [Corporation]. The thing was called LGP-30 which was for Librascope General Precision and they were makers of some equipment…I don't know what it was. The Royal Typewriter Company bought them and somehow McBee came in and I don't know what the relationship was of that. It was Royal McBee and later the company became Royal

Precision and they actually came out with a later model called the Royal Precision Computer…RPC, which we didn't get because we had other ideas. But anyway, we got this LGP-30 and this was before the Bradley building was built in, I don't know, '61, '62.

In the basement…we got allocation of space in the basement of College Hall, space that was occupied by the college photographer, Adrian Bouchard. He had his office -- big stuff and his lights and all of that down there. We got a corner office about eight feet by ten feet with a door and here is this machine.

End Tape 1, Side A
Begin Tape 1, Side B

KURTZ: So, at any rate, we got the LGP-30 here at Dartmouth and got space in the basement of College Hall and a little tiny office. That summer, we hired students just to do interesting things -- whatever they could. You know, Kemeny was working with students in the Honors Program and all that sort of thing. "Let's do some stuff."

I can remember the work that they did that summer in just a few short months was just astonishing. Wow! Students basically are brighter than adults. They could glom onto this new technology just like that and figure it out. We had to work harder.

Just one little story…I remember…The name Bob Hargraves [Robert F. "Bob" Hargraves, Jr. '61] should come up somewhere in this business because he was the class I think of 1962, but he was a physics major at Dartmouth. He went on to get a Ph.D. in physics. He came back to Dartmouth as associate director of the computer center many years later. At any rate, he was one of those that worked on the LGP-30 that first summer and he devised a simple higher-level language program. By today's standards, it was pretty crude, but it was FORTRAN-like, you know -- sort of -- in just six weeks.

So there was that and also -- '58, '59 -- I think it was the summer of '59, a graduate student at Princeton by the name of Ned Irons spent the summer at Dartmouth to develop a computing software technology called a syntax-driven compiler and he was thinking of a big CDC 1604 machine back at

Princeton at that time. But I knew his mentor Forman Acton at Princeton so Ned Irons stayed at my house at 24 East Wheelock Street, which is now a Kappa Kappa Kappa…the tri-Kappa House. So we got to know what he was doing and we just sort of gravitated into this whole computer milieu in the very early days when, you know, you could do anything you wanted because nothing was off limits.

So we knew about this kind of stuff. We knew about ALGOL [ALGOrithmic Language] and how you would write a compiler for a language like that. Our students knew about it and so there was that project. There were several other fascinating projects that they did on the LGP-30.

Then, a little later, when we got the Bradley building in 1962…by that time ALGOL was a well-known language. It never took off in the United States as it did in Europe, but nonetheless it was the first language that was designed before it was built. In other words, they had an article called "The Specification for the ALGOL Language." It was a written document as to what it was supposed to do, before anybody did any programming. So we were able to take this document and a bunch of students including Hargraves, who hadn't graduated yet. Bob Hargraves, Steve Garland [Stephen J. "Steve" Garland '63] who was Class of '63, Jorge Llacer ['62 TH '62], and Tony Knapp [Anthony W. Knapp '63] wrote an ALGOL compiler for the LGP-30 and they made this little magnetic drum machine hum. The drum goes around. It is an ingenious design, but they made this machine stand on it's head. I mean they just were amazing.

So we got the idea -- brilliant idea -- of trying to make, to use this. What you had to do was punch up your program on paper tape. We used to use paper tape. So what you do is punch up your program on paper tape as the input device. Then you would load the ALGOL compiler into the machine. Then you would load your tape into the machine and your program would start to run. But it was a one-shot deal. When the next person came along, he had to repeat the process. So we got the brilliant idea of making what was called SCALP [Self-Contained ALGOL Processor].

Incidentally, somebody thought that the name "SCALP" came from the fact that the Dartmouth Indian was the school mascot at the time. If it is, it was unknown to me because I didn't make

up the name and the students that were working on it didn't. It seemed like a reasonable name. Whether it had anything to do with Indians or not, I don't know.

But, at any rate, it was self-contained. They put this together so they could put the ALGOL thing in the machine and leave it there. Then the students would come and it would go. The next student would come and it would go and so forth. So we could actually get from three to five students to run their programs in a fifteen-minute period. I gave open announced lectures on how to do this in these lab sessions. It was in the top floor of Bradley and we had two typewriters that could work with paper tape. They were called flexowriters. One was attached to the machine. It was one of the input devices for the machine. The other was in another room so they could make tapes off-line while they were getting ready.

This is about 1962. Again, the work that these students did was superior -- you know, intellectually and technically -- to what the computing profession at that time was doing, you know, which was mostly in industry. We knew that because I used to go to the share group conferences for the LGP-30… You know, we would meet and people would talk about their programs and stuff like that. So we did some amazing stuff with those students, just incredible stuff.

DAILY: What kind of applications were they writing the programs for?

KURTZ: Well, this is astonishing. This is the LGP-30. One of the students wrote a concordance program and he typed up the entire works of Wallace Stevens on punch paper tape and he produced a concordance of the work, of the poetry of Wallace Stevens. [Laughter] I think that was it. You know that is pretty heavy stuff. The machine was fairly reliable. We would set it running at night and come back the next morning.

Then another pair of students were exploring some number theoretic ideas and they wanted to test whether a certain number was a prime number or not. So they wrote a program for the LGP-30 that used large numbers. I mean, they wrote everything. There was nothing there. They had to write from scratch.

They would set it running at night, come back the next morning and press a button, at which time the program would go into what is called a check-point restart procedure. So it would remember where it was, put out the partial results and stop. Then that night they would restart at that point. They used 120 hours of computing time and proved that this particular number was prime. I mean, these are undergraduate students.

DAILY: Right.

KURTZ: Okay. So at about this time, we were getting very much interested in computing and what were we going to do for the next machine? You know vendors would come around and I would see their stuff. Nothing was very interesting. The machinery that was around was all designed for, you know… UNIVAC had the Census Bureau machine type of thing. None of it seemed very interesting to me.

I was having a conversation with John McCarthy who was at MIT at this time. It was about 1960…'61 or '62. He said to me, "You guys ought to do time-sharing." Well, we knew what time-sharing was because McCarthy and his colleagues at MIT had invented time-sharing and that was a way of putting several terminals, typewriter-like devices on the same box and then the operating system would arrange so that they would spend a little bit of time on this guy's program and a little bit on this guy's program and so forth. When you are done working on this guy's program, they would write it off into a big drum backing store. All of this is trivial now, but it wasn't then. So that was…They invented this general purpose time-sharing, fundamentally. The special purpose time-sharing was around. I think one of the stock markets had some computing machinery, but that was a special purpose.

"So why don't you guys do time-sharing?" So I came back to Dartmouth and I said, "McCarthy thinks we ought to do time-sharing." Oh, no, that's not quite right. I said to Kemeny, "I think we ought to allow all Dartmouth students to use the computer." Or some words to that effect. I don't remember Kemeny's exact words, but he agreed.

Dartmouth had the largest open-stack library in the world at that time in a college of this type and the concept of open-stack computing, that was my idea. That's one of the few ideas that I

had that Kemeny didn't have. [Laughter] So he agreed and somehow or other, in the mix of discussions of this, I said that John McCarthy had said we ought to do time-sharing as a way of taking a big machine and have lots of users simultaneously think they are using that machine, but they are really just sharing tiny little time slots. So he said, "Fine." So he went around trying to get some money from the NSF for this. He also worked very hard through Dickey and the trustees to get them to appropriate the money that would be needed to buy the hardware. They actually agreed.

I am sort of skipping around. Myron Tribus ['42] was newly dean of the Thayer School at the time. He had been an executive at General Electric, so he said…he signed onto this, too. Myron had always been an avid supporter of anything that John and I wanted to do and Dickey, by the way, also. So Myron Tribus said he knew this guy, Clair C. Lasher, who was the manager of the GE computer operations in Phoenix.

By that time, computers were pretty much all over the place -- vacuum tube machines. This was just before the advent of the wide use of transistors and they had machines that were used in business and so on with these punch cards for inputting. They also had a machine that was used to store and forward for teletype messaging. You know, when you send like -- not a telegram, but -- just teletype messaging within a company. So it would be like, well, it would be like email and it would go into this thing and it would be sent out again. They had a box to do this thing.

So, at any rate, we contacted GE and said, "This is the project we want to do. Would you be interested in donating a computer?" Well, they didn't have any idea (a) what we were talking about or (b) that we could do it. "What's this nonsense?" So this was in 1962 and I asked one of my students -- an extremely bright kid named Tony Knapp, who has since gone into mathematics -- to design a time-sharing system. He sat down and he wrote block diagrams. He had this fifteen-page paper and he and I took that down to Phoenix with us and we went to the GE plant. They treated us like customers. They took us to dinner. They took us to a show.

We wanted to talk to somebody about technology, you know. It's true. A couple of people in the organization picked up on

this. So, at any rate, that seemed…we weren't going to get a free machine. You know IBM, they give out machines at extremely rich discounts on the grounds that they were going to get it back in terms of marketing. But GE wasn't quite ready to do that. They did have an educational discount policy of 50%.

So we went down there and finally got a proposal from GE based on 60% discount. Okay. So John Kemeny went to work on the trustees. He said, "I am applying to the NSF for funds." And the trustees said, "Okay. We will sign a lease-purchase agreement, so if you don't get the money from NSF, we are only stuck with the lease up to that point." So then John went to the NSF and said, "This is what we want to do." Of course, the NSF sent out the proposals to reviewers and the reviewers said, "That can't be done."

DAILY: Technically, it couldn't be done?

KURTZ: Undergraduate students?   It's like asking undergraduate students to build a rocket to the moon. It can't be done. Right?

DAILY: Okay. All right. Now I see where the…

KURTZ: Well, John knew it could be done. I knew the students were as bright as anybody in the business. So, at any rate, the people at the NSF -- the program managers -- thought it was a good project. John was very good at tilling the soil, making sure all the ducks were in a row and all of that kind of thing. His preparation for any new project was complete and he had done enough politicking with his buddies down at the NSF that they were enthusiastic about the project, or at least thought it was worthwhile pursuing.

We did get some money -- I don't know how much it was. It wasn't a heck of a lot but we were able to convert the lease-purchase agreement to a pure purchase and the machine came in. It came in in February. Before that, the previous summer I think, we took some students down to Phoenix. Well, I'm not sure of the timing, but we arranged to have some students working on this and, even before the machine arrived, they started yacking away about how they would build this thing, you know. Basically, there was very little literature. There were no courses, so they were developing from scratch. You know, if computer A sends a message to computer B, how does

computer A know that computer B has received the message? You know, this kind of thing. So they did all this acknowledgment stuff back and forth. They figured all that stuff out and the two guys who were the prime movers on building the operating system were Mike Busch [Michael D. '66] and John McGeachie [John S. McGeachie '65 TU '75]. Mike Busch is somewhere in the country, I don't know where. I've got his email address. John McGeachie is around. He is involved in the restoration project. I don't know if you have heard about that.

DAILY: No, I haven't.

KURTZ: A project to restore an early version of the Dartmouth time sharing system.

DAILY: Oh, really.

KURTZ: We've got the code, most of the code. Not all of it, listings, and so we will build an emulation of the hardware, which is not hard, by the way. I've tried to do it in True BASIC and have got it half done. Then put the code in there and it will be a simulation of the original Dartmouth time sharing system that people can sit there and type in programs and stuff like that. We have been talking to the people at the computer museum in San Jose about this and I have mentioned it to people here in the archives department and they said, "Wonderful", but they are basically not interested in it yet until, I guess, it actually works.

DAILY: Well, we need to see what we can do about that.

KURTZ: Well, the listings that we got were found in somebody's garage in Texas. Okay. It was a GE employee or a former GE employee. He was about ready to throw them away.

DAILY: Okay. Who was that?

KURTZ: George Freind, I think. A former GE employee. If you want to pursue this, we can get…The guy who is leading this project is Steve Hobbs [Steven O. Hobbs '69], who was one of the original student programmers, not the very first year that we did it in '64, but '65 or '66. He lives in the east. He used to be with DEC and then Compaq and now riffed -- reduction in force -- and was

taken over by HP, so Steve is now working for Intel. But he sort of spearheaded this whole business.

What he did was to get these listings up from Texas. Then he put them onto a scanner and converted them page by page into PDF and two other formats and put the results on a CD. We all got copies of the CD, one page at a time. You know, thousands of pages of manuals and listings.

So, at any rate, that is a project that is moving along and we hope to have that ready by the 40th anniversary of Dartmouth's time sharing, which will occur in 2004. We hope to do something. We are not going to do a symposium or a conference because that is too much work and, you know, there are too many papers out there anyhow, but to have some kind of a celebration. We hope to have our simulated 1964 version. Actually, it is 1965 version because we don't have the original listings. You would correct a few bugs and you would make a new listing every week and throw the old one away. So it is a moving target. So that is going on and John McGeachie is involved in that. He is also in the east. He is involved in that project. They did the thinking. They have got the manuals on the GE computer, of course, ahead of time.

The computer arrived in February of 1964 and was installed. They eventually got it running a week or two later and John Kemeny proposed to GE that they provide a full time maintenance guy. Hardware maintenance was an important concept in those days. So they found a guy who wanted to come to Dartmouth. He came on the Dartmouth payroll. He became our employee. He was with us for two or three years and then he went off on his own, but he was full time, so we had a full time repair guy, which was a godsend because those machines were always breaking down.

DAILY: I was curious about that…how you took care of the hardware.

KURTZ: He did and he ran this preventive maintenance stuff every day and we had extremely good up time. I don't know what they were, but they were very good. So again, that was something that Kemeny had realized needed to be done. Then these kids worked fifty, sixty hours a week. We paid them for ten hours a week or whatever. We paid them whatever…fifty cents an hour or whatever. I don't know what it was. They were kind of…"It's

fun. It's fun." They were down there all hours of the night, you know, banging away at this stuff trying to get this stuff to work the way they wanted it to, re-writing, debugging and all that kind of stuff. They finally got the first program to run on May 1, 1964 and the way the story goes…at four o'clock in the morning, two programs were typed in on two separate teletypes…we had two teletypes and only two at the time. They pressed a button and they both ran. I say that this is "so the story goes" because neither John Kemeny nor I were there. He liked to work nights. I didn't. I was home in bed. He had no recollection of it, but we agreed that that was a pretty good myth and we would support it. [Laughter]

I mean, so much of history is myth because, you know, if you are not there taking pictures, it's people's memories. Okay. So that's how we got started in computing. As you can see, very early, 1956, and there are these historical events that I referred to, of course, had very little influence on us personally, but we both had previous experience in computing, both Kemeny and myself.

We got students involved. One reason we got undergraduate students involved is we didn't have any graduate students. Right? So what do you do? You involve undergraduate students. That's always been Dartmouth's big thing -- the undergraduate college is the prime part of the institution. That is still true. So it worked out just fabulously.

DAILY: Now where does BASIC fit into this?

KURTZ: We realized that when we did the Dartmouth time sharing system, we were trying to reach everybody on campus who wanted to use it and we would have to simplify the user interface. So Kemeny got the idea of using just ordinary English words like "hello" and "goodbye" instead of "log on", "log off". The brilliant idea that's never caught on. I just can't stand the complexity of some of the applications we have out there today; very few of them are user-friendly. They claim to be user-friendly, but they aren't. If you want to make a new program, you would type "new". If you want to use an old program that you had around, you typed "old"; not this -- what is it "load", or whatever others use? His idea was that you use simple English words.

Then we looked at languages and we both decided that the languages FORTRAN, ALGOL -- that type of language -- were just too complicated. They were full of punctuation rules, the need for which was not completely obvious and therefore people weren't going to remember. I tried to come up with a subset of ALGOL that met our needs and couldn't do it. ALGOL requires every computer statement to end with a semi-colon, so you get this weird semi-colon stuff floating around. So I finally decided that was not possible, although I did look at it and I agreed with Kemeny that a new language was needed.

So we worked on that and we had looked at some of the other languages that were around. There was a language that John had used at Rand Corporation. I think it was called JOSS [JOHNNIAC Open-Shop System] or something. I'm not sure about that. So that was a teletype-based language. But it had some funny rules like all computer statements had to end in a period. Well, that means that you couldn't use decimal numbers. You had to use integers, integer numbers without periods. Well, that wasn't going to work for us. So we said, "Let's use one line, one statement. You type a line, carriage return. That's a statement."

Again, the idea of using English words for all the computer statements. Now it is true that most languages today, they use words for all statements except what is called "the assignment statement". In FORTRAN, it looks like this. Suppose you have a program…let's take this as an example. You would write this as C = A + B. It doesn't' mean that C is equal to A + B. It means compute A + B and store the result at C. ALGOL used C: = A + B;. Okay. Other languages used similar constructs. It is called the assignment statement. Kemeny had the idea that all statements in BASIC, not just most, but all of them should start with an English word. So that came out to be "LET C = A + B". Now this is the kind of terminology that mathematicians use. You would say, "Let blah, blah, blah…", setting the stage for some mathematical theory. It always starts out with the word "let".

One of the other projects that was going around was at Cornell and they used the word "set", which is also perfectly reasonable. But we stuck with "let" and that became it. [Note from narrator: when Cornell's CORC finally came out, they had switched to LET.]

The original BASIC, I think, had about fifteen of these statements in it; all that you would need to write a simple program. Oh, yes. I should give you a copy…I have a copy of a facsimile of the original BASIC language manual of May circa 1964. You can see what it was like. I will get that to you somehow. What are we going to do? Are we going to meet regularly?

DAILY: Yeah. We should plan for some other sessions a little bit later on this morning.

KURTZ: Okay. I will bring it in the next time.

DAILY: Okay. That would be great. I took BASIC or played around with it, let's see…I graduated in '83, so it would have been the spring of 1983 and then went on and went to college. I was a history major. My professor said, "You need to take computers." I am sure he really didn't know why, other than they told him that he should tell his students that. So I ended up with FORTRAN, which was like wow, that was hard.

KURTZ: It was hard.

DAILY: As far as any kind of computing language, that was it for me.

KURTZ: Okay. I am going to bring you a reprint of another article, "The History of Programming Languages."

DAILY: That would be great.

KURTZ: At the first History of Programming Languages Conference, I gave a talk on BASIC. I sort of outlined the reasons why languages like FORTRAN…why we looked at them and discarded them.

DAILY: FORTRAN stuck around for a long time.

KURTZ: Oh, it is still around. It is true that any computer language is a good language once you learn it. You know, you learn to use it and you use it and it does the job for you. You don't need to look elsewhere, fundamentally. People that have learned how to use FORTRAN use it quite comfortably. It has some nice

things in it that people in science and engineering can make good use of.

So, at any rate, I will get you those two things. Now, let's see. What were we talking about?

DAILY: You were talking about how both you and John tried to make BASIC kind of use English words.

KURTZ: There is actually…We pitched this to the NSF, that what we were going to do…I think this is…I am not sure. There were two grant proposals to the NSF. I am not sure how the work was divided between the two. One was to have time sharing, so we would bring the computing to the people, rather than bringing the people to the computing center.

In those days, most university computing centers…you had to carry your card deck to the central room and then give them to the counter and some low level bureaucrat…you had to plead, "I need my results," you know, this kind of thing. [Laughter] Very few people were willing to do that, particularly people who weren't in the science division or engineering school. So bringing computing to the people, having a simplified user interface that really was simple to use, using English words that were easy to remember. Your mind remembers things that are familiar more readily…or something like that. Then BASIC -- a simple language -- so if you wanted to write a program, you could do so.

Also, instruction in the use of this beast, which -- let's see -- I guess it was decided to attach the instruction to the second course in calculus to make it required in that extent. But no more than that because we both felt that, if it was required by all students as it was later in some prep schools, that Dartmouth students would rebel. Okay. So a unit was attached to the second course in calculus. The students were asked to write four programs, simple programs for computers. We developed a system called TEACH for the automatic checking of these programs and it…

End Tape 1, Side B
Begin Tape 2, Side A

DAILY: Okay. We are back on. One of the things that comes to mind is kind of this nucleus of people interested in computing and things were kind of a buzz. How much reaction to this was there, say in the administration and other areas of the faculty? Do you recall? Were people taking notice of it, essentially?

KURTZ: Well, yes. I described the fact that in June of 1964, John Kemeny gave a public lecture to faculty members about this new beast. I think that did a lot. Some faculty members were slow to respond, but once they got a teletype in their own area -- in some cases, that took several years to bring about -- they would go in and do some very interesting work.

                For example, in language instruction, there were a couple of people who did some very interesting work in the early days. You know, CAI is not highly touted anymore; but I felt that they had done some quite ingenious work in verb endings and things like this, which was above the normal cut of what you saw in CAI in those days. So eventually, the whole campus embraced this; or those that didn't embrace it didn't dare speak out against it.

DAILY: Okay. [Laughter]

KURTZ: I am sure there were a few of those, but the support from the administration came. Dickey gave Kemeny support uniformly all along the line. There is no question about that.

                One incident that happened -- it was about 1963 and we had signed a letter of intent with GE -- I think this was in the spring of 1963 that we were going to get this machine. Now, previously to that, we had looked at a lot of different machines and I can give you the list if you want, but some of that is written documentation. I don't need to repeat that.

                At that time, Robert Oelman ['31] was chairman of the board of trustees or on the trustees and he was also president or CEO or whatever it was at National Cash, NCR [National Cash Register]. Now NCR had a machine also. So it was decided that we would ask Robert Oelman to form a team to look at what we had seen in terms of the proposal that had been sent to us and then to make an evaluation of our decision to choose GE -- you know, an outside opinion. That was done and basically they

backed up our opinion. So we signed a letter of intent with GE to purchase/lease this stuff.

At this point, IBM, who had almost always had representatives on campus where they can politick for their…There was extremely strong marketing in those days and they used to… If somebody was going to buy a non-IBM machine, they would go to the guy's superior and say, "This guy doesn't know what he is talking about. You really ought to go with Big Blue." I think Bill Gates learned most of his lessons from IBM. But that's an aside and probably not worth printing. [Laughter]

At any rate, what happened was that IBM took umbrage at our signing a letter of intent with GE and they sent a group up to Dartmouth. Now they didn't contact Kemeny or me. They contacted the president, several members of the board of trustees and said that Kemeny didn't know what he was talking about. Well, Dickey, you know, he wasn't going to…McLaughlin [David T. "Dave" McLaughlin '54] would have listened to them. Dickey didn't.

At any rate, at one incident, they went to the office -- Leonard Rieser's [Leonard Rieser '44] office. I don't know if he was provost or dean of the faculty at the time. So the story goes, Rieser said, "Get out of here." They said, "Kemeny's folks don't know what they are doing." Rieser said, "Get out of here." I don't know. I wasn't there. I accosted Rieser a few years back before he died and asked him about this and he had no recollection of it, so who could say what really happened.

But, essentially, for many years, IBM was *persona non grata* on this campus and they didn't come back until later during McLaughlin's presidency when the Thayer School of Engineering wanted a certain type of machine to do image processing or something of that sort and it turned out that IBM was the machine that they wanted and also McLaughlin was friends of one of the IBM senior vice presidents so IBM came back on campus. But they were very circumspect by that time as to what they said. [Laughter]

DAILY: That kind of opened up the door for Mac probably down the road.

27

KURTZ: Well, that was all technical. It was all technical qualifications and the reason for that was that we wanted to do an on-campus network. The other part of all of this computing thing was that Dartmouth was computerized in the minds of people at a very early stage. Being a graduate of Princeton, I get the Princeton alumni magazine and I used to read articles every once in a while that "so and so did some interesting computing work." Well, you know, we did that five or ten years earlier here.

So people like…Ag Pytte [Agnar Pytte] was provost at the time and other people in the administration, they were thoroughly familiar and comfortable with computing. It was not a foreign thing the way that it would be at any other university in the country at the high levels of administration. So it was perfectly clear that the important ingredient of what we were doing was communication. We were using. We could use the computer system to share programs. Well, if the program actually consisted of a letter, you know, you wouldn't run it, of course. It wouldn't run, but you could share it. Also we had graduated to the 600 Series of GE and that was even more… We could send email.

I remember in 1979, I was in England and sent an email to my wife. "You've got mail". [Laughter] AOL is "Johnny come lately" as far as we are concerned. We used "You've got mail, type mail." They say, if you have mail, then you are supposed to click on the icon. We didn't have icons in those days. It was perfectly clear that communication was the thing and, at the same time, Mac was coming out with this marketing thing where they were going to try to put MacIntosh computers in a number of universities and call them "Mac sites". I don't know what they would call them. They had some idea. So it was the early days of personal computing in 1983, not the early days of micro-computing. That was in 1975 or so…'74 or '75. The first micro-computers that were widely available came out, but they were hard to use and expensive and so on.

By 1982 or so, it was perfectly clear that this was the wave of the future. So we invited IBM. I wasn't involved. I think they deliberately didn't involve me in the decision-making process. It was at the provost's office, I believe there was a committee or something. They invited proposals. Well, at that time, there was the Mac proposal and IBM… The only thing IBM could offer was this peanut, which is a PC Junior, which is a disaster.

DAILY: Yes. I remember that.

KURTZ: The Mac was superior to the PC Junior in a number of ways.
                Number one, it used less power and the College was concerned
                about the drain. If every student had a computer, that's extra
                drain, extra use of power and they outlaw hot plates in their
                rooms because of the power they use. Number two, it was a 32
                bit architecture inside rather than a 16 bit architecture, which
                means that the potential for getting larger programs and larger
                machines in the future was there.

                There were some disadvantages to the PC Junior. It had kind of
                a chiclet-type keyboard. You have seen these things, these
                rubber covered things. So it wasn't a true keyboard. The big
                advantage of the Mac is it had… The networking stuff was built
                in -- automatic -- from the very beginning. Hardly anybody
                knows this. They just plug it in the back and you are in
                business. So the College decided that MacIntosh was it and
                they got a grant from the Pew Foundation I think or one of those
                foundations to help wire the campus. So we were the first
                campus in the world to be wired for universal access to
                computing.

DAILY: Let's back up a little bit in this in terms of the network. Say from
                between '64, '65 and 1982, was there any kind of …What do I
                want to call it? Basically a prototype of a network on campus at
                all or was it all just right there?

KURTZ: Well, the way that I think of it, it evolved. See, originally the
                network was… There was a computer center and one of the
                boxes dealt with accessing teletypes coming in through phone
                lines. So it was a point. Everything went through this box.
                They -- the networking people -- developed a jargon. The
                network architecture was the star network -- the center with
                things going out. But then, in order to handle the on-campus
                network of thousands of people networked at the same time,
                they wouldn't all be using the big machine any more. But to
                handle that, they couldn't use that network architecture.

DAILY: Right.

KURTZ: Right. So what they did was to…By that time, Dartmouth had a
                crew of professionals who were skilled in that area. Stan

Dunten [Stanley D. "Stan" Dunten] was the leading guy. He came from MIT and they took some machinery that New England Digital had developed for the computerized music project of Jon Appleton. So it was the New England Digital hardware, which is designed to generate sounds according to certain patterns. They actually built from that hardware node machines of the type that is now manufactured by Cisco. Then all the wires from the dorm would go in there and then there would be a…

Originally, it was a coaxial cable and during the project to wire the campus for TV, Bill Smith [William M. Smith], formerly of the psychology department…He had an office of something or other that was devoted to television and that type of thing…office of something or other. It was in the basement of this building [Webster Hall], as a matter of fact. So they were going to put coaxial cable, bury coaxial cable around the campus. So it was decided that they bury an extra coaxial cable, you know, in the steam tunnels or wherever it was, for the computing thing. I don't know if it was ever used, but that was the idea. So here are these node machines and then ordinary twisted wire would go to the students' rooms and then there would be the coaxial cable.

At that time nationally, the theory of distributed communications was pretty well known. There was an international standard called X25 and Dunten knew it and so on. It is how you send messages. You take the message and you put a header on it which says where it is supposed to go and you send it out. Then that machine gets it and it says, "Well, the best way to go there is over here" and it sends it to the next machine. ARPANET was the progenitor of all of this. So we built our own network based on our own needs and Stan Dunten actually built the hardware and wrote the programs.

DAILY: About what time period are we talking?

KURTZ: This would have been in…after 1970…'79.

DAILY: So pushing close to when the Mac….

KURTZ: Well, the thing is, when the Mac decision…When did the Macs arrive?

DAILY: I thought '82.

KURTZ: It wasn't that early.

DAILY: I think between '82 and '84.

KURTZ: I think the Mac came out in '83 and it would have been '85 before it was actually here. But, at any rate, it was consistent with that because we had to have that in order to service the Macs. It is just like…Remember the early days of telephoning in New York City? They had these telephone poles with a thousand wires going through. You had to have a better way of doing this. So that was consistent in time with the arrival of the Mac and universal access to computing. Then, of course, since they replaced coaxial cables with fiber optics, which are much better, much simpler and so forth. Stan Dunten retired a couple of years ago and goes sailing. He loves sailing. He has got a boat.

DAILY: Who are some of the other names I've seen -- like Tom Byrne [Thomas E. "Tom" Byrne III '55 TU '56] -- who are some of the other folks who were involved in the operation of the time-sharing system that stand out and your recollections of them?

KURTZ: Okay. In 1963, before we had the time-sharing system, John Kemeny wrote a prototype of BASIC compiler and he wrote it for punch cards. Then he was going to test-run it on a GE computer somewhere in Massachusetts…I don't know where. It might have been in Boston. So he hired for the summer a fellow named Zani [William M. "Bill" Zani TU '64], who was a Tuck School student. I think it was Bill Zani, William Zani and William Zani became his assistant that summer and did what I had done many years earlier. He carried the cards down to the place…

I am trying to think who else was involved. I think William Zani was involved in the very, very early days of setting up the computer center which, ironically enough, went back in the basement of College Hall. I don't know what had been down there at that time in '64. Oh, yes, I do. What it was decided was to displace the college photographer, Adrian Bouchard, into the newly-built basement of Bradley which is now graduate student offices. That went out in 1966 or so when, as part of another NSF grant, in order to get it funded by the education department, we said we were going to build offices for graduate

students in Bradley or something like that. I forget what the deal was. I am getting things mixed up. We were going to have graduate students. I know, it was in the basement of Kiewit [Kiewit Computation Center], the newly-built Kiewit Center. So that was how they got some money to help support that project.

Okay. So there is Bill Zani. He had a brother and I can't remember the brother's name who was a salesman for GE as a matter of fact. I don't know if that helped us in our relationship with GE or not. About, I would say, a year later, maybe '65, we were looking for a person to be a business-manager type for the computer center and Tom Byrne became interested and he was working that side of the street, you know, for many years. He would do the budgets and he would do the actual hiring of people and things like that. I guess he had worked for the telephone company before. He was a graduate of Dartmouth and of the Tuck School and then he worked for the telephone company. He came back up here. Everybody comes back up here if they can. [Laughter] So he was that person and he had the title of assistant director or something. I don't know what it was.

We hired a fellow named Ken Lochner [Kenneth M. Lochner] about '66 as a chief programmer because we thought we needed a professional programmer to lead the students.

When Kemeny was involved in this project, '64, '65…Budget-wise, he was spending $1/12^{th}$ of his time on it. He had other things going on. He was chairman of the department. He was involved in this. He was involved in that…various Sloan grants or whatever. You know how things go, so he had to be principal investigator of this project, so he had to be listed. He was $1/12^{th}$ time on the computing project. [Laughter] Leonard Rieser used to say, "Well, what's wrong with that? $1/12^{th}$ of 168 hours a week, that's not too bad."

DAILY: That's not too bad.

KURTZ: So Ken Lochner was with us for a couple of years and then he didn't like the arrangements that were going on. We were kind of open. We depended more on students, you know, and so he felt a little out of joint and left. Subsequently he started a company -- another company -- that actually got the Federal Trade Commission…No. No. He was an official of an

organization called the Society of Data Processing, something or other, DPMA…Data Processing Managers Association. In his official position, he issued a complaint against Dartmouth because, at that time, Dartmouth was trying to market the time-sharing program through DTSS, Inc. That's another whole set of stories. So he left after two or three years.

Other people who were involved. There was a young man named Tom Jackson [Thomas C. "Tom" Jackson '57]. I forget his middle initial and the middle initial is important because there were two Tom Jacksons who worked in Kiewit. He wrote some stuff, some editing stuff for early Dartmouth time sharing.

This is when it was still in the basement of College Hall. He was a promoter of this thing called "The White Bike Movement" on campus. He was basically a communist. You know, these bikes would be around. You would use them and you would leave them and then another person would…this kind of thing. Myron Tribus read some of this stuff and what Tom Jackson was doing for his examples was using some of the writings of Thomas Jefferson. Well, you know, Thomas Jefferson wrote some pretty wild stuff and Myron Tribus called me and said, "You have got to get rid of this out of the manual." There was some quote of Thomas Jefferson. He was off the wall a lot of the time. [Laughter] I said "No." It was perfectly harmless as far as I could see.

DAILY: That's too funny.

KURTZ: So, at any rate, he was with us for a short time. There was a young man from Stanford…We needed a guy…When we got to Kiewit, we needed a guy to do something. I forgot what we were asking him to do. There was a guy at Stanford named Tom Jackson also, different middle name. He came and was here for a couple of years. He had a character flaw. He couldn't make a decision without a paper backup authorizing him to make the decision. We weren't like that. So he left after several years.

Another interesting fellow that became involved in the early days…When we got… In 1964, '65 to '66 when we moved to the new Kiewit Center, a lot of people came up to see what this thing was. They had heard about this thing, you know. Dick Hamming came up from Bell Labs to look at it. He was actually

one of John Kemeny's superiors in the Los Alamos Project…a well-known mathematician and numerical analyst. Other people came up. George Stibitz came up and eventually stayed on in the Medical School.

One of the guys, Gene Fucci [Eugene A. "Gene" Fucci] who came up, was a lieutenant colonel from the Air Force. He was involved in teaching courses at Maxwell Air Force Base in Alabama or some place, wherever Maxwell is. I think he might have used it. He might have, you know, gotten a teletype and signed a contract and used some DTSS. We were doing that in those days. I don't know for sure. But he decided to come up. He looked at it and then he decided he wanted a job up here so he actually retired from the Air Force a year or two earlier than he should have, if he wants his full pension, and we gave him the job of…Let's see. We gave him the job eventually -- I don't know what he did initially -- of being kind of the workhorse if we had to write a proposal. He would be the work horse guy on that and, when we were trying to…after we moved to Kiewit Center. When we were trying to put more teletypes out in schools and colleges around New England mainly, he would be the salesman for that activity. He would go down…we were in the Coast Guard Academy for many years and other places like that. He was a true salesman.

The Gene Fucci stories are legion, are absolutely legion. He is still around. He lives in Hanover. He is retired, of course. Just to think of a Gene Fucci story. He was going out to St. Lawrence University. This was before St. Lawrence University had their own computers. They had teletype to our computers.

This is probably not printable, but it is interesting, just to give you an idea of how Fucci worked.   The president of St. Lawrence at that time was a guy named Piskor and Fucci's name is spelled FUCCI. You used to call Fucci, Fucci or Fucci…depending on your pronunciation. So he goes into the president's office at St. Lawrence and starts out the conversation, "I won't call you "piss core" if you won't call me "fuck eye". [Laughter] He was a fabulous guy. A breath of fresh air, you know. At any rate, he just did all the dirty work that was involved in this and was a loyal guy. He always had this military view of things. Like he said to me, "I'm a general and he [Fucci] is a colonel and he obeys my orders." He was a funny guy to be around. His stories are legion and he

came…His first appearance was when we were still in the basement of College Hall. He came up to see what we were doing.

Other people…Well, you know the fact is that Tom Byrne probably remembers more people's names than I do. He might have even put together a time line chronology of who worked when and so on.   But, once we moved into Kiewit, it became a department, a bureaucracy, sub directors and assistants and all this kind of stuff.

DAILY: So how did Peter Kiewit's [Peter Kiewit '22] name end up on the building? Was he interested in computing or did John Dickey get him interested in computing?

KURTZ: '66. Dickey would have been involved. Incidentally, I've talked to people subsequently about it and who made the big pitch to the Kiewits and who made the primary approach and people like Lu Martin [Lucretia Sterling "Lu" Martin] may have been involved. Jean Kemeny doesn't have any recollection of playing a significant role. The highlights of it are this: Peter Kiewit, as you know, went one term to Dartmouth and then he went off to Omaha to make his millions. He has supported colleges nearer to Nebraska. He is a big beneficiary of his…So, at any rate, Dartmouth had him on the list. The way that the fundraising office works is, here is this guy. What will we ask him to do? It might take twenty years before they come up with a project. So the computing project came up, the new building project. Somehow, Peter Kiewit's name came up. Maybe this would be something he might be interested in.

So some approach was made and I think initially he was negative about it. Maybe he wasn't interested in computing. He certainly had no great love of Dartmouth. He was only here for one term. Into the mix comes his wife and his wife -- Peter and Evelyn Kiewit -- and Evelyn said, "You know, you really ought to get rid of some of your money" or some words to that effect. "It is the reasonable thing to do." The way I understand it, you know, third-hand, fourth-hand, whatever it was…that she basically talked him into it. I have asked Jean Kemeny about this, but she doesn't seem to remember. So Evelyn Kiewit played a very significant role in that project. Well, that's how it happened.

DAILY: I wondered. I didn't know if there was something deeper than that.

KURTZ: No. I remember the Kiewits were up visiting once at a social hour or something like that and I happened to be there. I think I happened to be there or whether I heard this later, I don't remember. But somebody asked Mrs. Kiewit, "Oh, you are a rancher." (They have a big ranch.) "How many cattle do you have?" She said, "You don't ask people how many cattle they own. It's like asking them how much money they have." [Laughter]

DAILY: With the time-share system… You said you tried to market it and stuff like that. Looking back, one question would be basically how you went about doing that and the second question is how successful you thought it was?

KURTZ: Okay. Here is how it started. We had the newer and better version of the Dartmouth time sharing system, which was really quite good technically and security-wise and everything else. It was about the year -- we moved into Kiewit in 1966 and, in '69 -- I think it was the fall of '69, we were actually running full-time on our own version. In the interim period from '67 to '69, we were using a hybrid version that was developed by GE which they then took off and ran on their own machines. So we would run part of the time during the day using their system and then at night the students would work on our system. So in 1969, our system took over full-time operation and GE left. '66…'69…Yeah. There was still some connections with GE, but the story…

I can remember one meeting that Tom Byrne was at -- I wasn't at -- in the Hanover Inn. The phone company was saying that they had heard about this thing up here. "What's going on?" So Tom Byrne started giving them statistics. "You know, we are talking about 200 simultaneous users coming in through phone lines." The telephone company officials blanched because that

The question is how did the Dartmouth time-sharing system become commercially available? Somehow or other, I believe there was a terminal. Yes, there was a terminal. Now the time-sharing system was much bigger. We had perhaps hundreds of off-campus users, maybe not that many, but it was…

would tie up the entire circuitry out of their White River, whatever they had in White River, you know.

What we did was to use techniques for getting a number of different uses over on the same "phone line". There were two techniques: time division multiplexing and frequency division multiplexing. We used frequency division multiplexing. So fundamentally, there was one line going out there some way or another and maybe ten users coming in on that line and they were coming in with different frequency notes. So that's how we got maybe ten users on a single line. Then these were full-service lines. They weren't dial-up lines anymore.

End Tape 2, Side A
Begin Tape 2, Side B

KURTZ: So there was a terminal of ours down at the Naval Academy and this is before they had their own computer. So somehow or other, the commandant of the Academy, Admiral James Calvert, decided that this was an important thing to add to the instruction at the Academy…computing and so forth. This was circa 1970 and Dartmouth time sharing was extremely reliable for general purposes. You could write programs in several languages and you could email communicate and so forth. So he decided that it would be a good thing for the Academy. So he decided to ask us if we wouldn't mind placing a copy of the Dartmouth time sharing system down at the Naval Academy.

Well, in order to run it, you needed GE hardware because it was very specific. All operating systems are very specific to the hardware. So how was he going to get GE hardware? He can't go out and buy it. Okay. He can't…That was called sole sourcing. He couldn't do it because of the Brooks Law for computer purchasing by the government. It had to go out to bid. You have to write the bid in a general way so that there is more than one supplier that can meet the specifications of the bid. Well, there was only one supplier that could meet what he wanted to do. That Brooks Law thing is a big fiasco in my view. At any rate, he figured out a way around it. He couldn't buy GE hardware, but he found another agency that was giving up their GE hardware, so he got it on inter-agency transfer.

So we said, "Okay. Copy the Dartmouth time sharing system. All you do is pay us $1,500 a month for maintenance because

we have to hire an extra guy to communicate and so forth and help you with your bug reports and that sort of thing."

So that's how it got started. Then it turned out that there was…I think there was a guy…The key people who I am going to describe next are Bob Hargraves, who lives in Hanover, by the way. He is retired and lives in Hanover. And Bob Chambers [Robert S. "Bob" Chambers '67, who has been around the world many times, but now is living in Hanover. They were intimately involved in the whole DTSS, Inc. operation. Bob Hargraves was the president. Bob Chambers was the first marketing guru.

So it turned out that Chambers knew some places that really could benefit from Dartmouth time sharing because, compared with other systems of it's day, it's ability to handle transaction processing was far greater -- maybe 1,000% greater -- than the competition. So he did get some placements, one out in Colorado and there are several others, but I don't remember the details. You will have to ask him.

So it was decided by the college to form a company for the purpose of handling these potential contracts and then getting more contracts. Well, eventually we got five or ten sites for Dartmouth time sharing system or the DTSS, Inc. did it. But it didn't go any further and one of the reasons that it didn't go any further is that companies just didn't want to buy something that was not mainline, even if it would save them millions of dollars. They didn't want to do it. They wouldn't touch it. So the only people that got it were the people who were willing to gamble and, of course, they saved during the years they had it. They obviously saved a lot of money. I think there may have been ten or twelve sites eventually that were established and used the Dartmouth time sharing system.

Incidentally, the first version of the Dartmouth time sharing system, built in 1964, was given to GE in 1965 for their use. They modified it a little bit and it became the backbone of the GE service bureau business and eventually reached a gross of one hundred million dollars a year. They eventually had…I don't know the number of sites…but maybe…I am guessing…thirty sites or something like that in various places around the country where they serviced their customers over teletypes and remote lines.

DAILY: Has anybody ever said that Dartmouth, looking back, could have made a lot more money on this?

KURTZ: Oh, I doubt it. How do you make money? You have to go into business and you have to market and you have to hustle. That's not our game.

DAILY: Right.

KURTZ: People ask, "Why didn't you copyright or patent protect or trademark BASIC?" Well, it wouldn't have been used if we did that. Nobody would have used it. They would have done something like it and called it something else and we would have been out in left field. But because it was publicly available, anybody that wanted to use it…you know, make a copy for their own machine…copy the language, we said, "Fine." Nowadays, of course, languages are standardized. Anybody can build a compiler for any language they want.

I remember when IBM came up in, it must have been, oh, I don't know, '67 or '68. They wanted to make BASIC for one of their time-sharing systems -- early versions -- and we said, "Fine." They took our manual and they did it exactly, including what we regarded as mistakes. [Laughter] We said, "Fine. All you have to do is give us credit in the front of your manual."   Now if we had tried to protect BASIC in any way, trademark or anything like that, none of that would have happened.

DAILY: Okay. That's interesting.

A shift away from computing here for a little while and I want to talk more specifically about the math department in the '60s, early '70s. First of all, with the graduate program coming on line in the math department, what was the extent of your involvement in that?

KURTZ: None.

DAILY: I know John Kemeny kind of…

KURTZ: By the time the Ph.D. program was started, I was fully involved in computing. I don't know the year, so I can't recall that. I do know a little bit about the Ph.D. program in math. Originally…Well, there had been graduate programs at

Dartmouth in the past. I am just trying to think. There weren't any at that time in arts & sciences.

DAILY: Right.

KURTZ: I mean during Hoppie's administration for instance there was an eye institution that I think he managed to quash. There had been others and, of course, Dartmouth leads in the professional education…

Thayer School is the first school -- graduate school -- of professional engineering or whatever it was. I forget the right words. Founded by Sylvanus Thayer, who was also the first superintendent. He was the guy who made West Point a real place. He wasn't the first superintendent, but he revitalized the place so and he was the first alumnus to give us money or something. I forget what it was.

The Tuck School was the first graduate school of business in the United States. The medical school was the fifth medical school in the United States. Dartmouth has a long history of graduate work in professional education, but no work in what we call classical Ph.D. programs.

So people in the science division were getting to the point where they realized that they needed to…if they were going to grow intellectually, they were going to have to have graduate programs….faculty members who would want to work with graduate students as well as undergraduates. So the math department was the first one under Kemeny to take the plunge. Kemeny decided that maybe it was too much to ask Dartmouth for a Ph.D. program in arts & sciences and so that, since teaching was so important at Dartmouth, the program would be a doctor of arts in the teaching of mathematics or something like that.

Well, he presented this to the science division faculty. I remember there was a science division meeting and the end result of it was none of the other people in the science division thought it was a great idea. They said, "You ought to go for a Ph.D. program, none of this half wishy-washy stuff." So the program was changed to a Ph.D. program and the trustees approved. I was not involved so I can't give you any details. Oh, there was a masters program much earlier, by the way. It

was when we were still in the top floor of Dartmouth Hall. There was a masters program in mathematics. I don't know. I think that was replaced by the Ph.D. program, so it stayed in existence for that kind of time.

DAILY: Now were the graduate students that were coming into mathematics, were they gravitating towards computing?

KURTZ: No.

DAILY: Why not?

KURTZ: The thing is, when you are considering graduate study in a certain field, you usually have your mind made up with what your favorite sub branch of that field is. You know, algebra, analysis, logic…and when the math Ph.D. program was started, computer science was not a recognized discipline on equal par with other academic disciplines.

DAILY: Okay.

KURTZ: In fact, I can remember a meeting I attended in Chicago…the University of Chicago…. When was it? I don't know. It was after I was director of Kiewit, so it would have been in the late 60s -- something like that -- and the question was, "Was computer science an academic discipline?" The argument went back and forth. Some said "yes"; some said "no". These are people who are in, you know, places like Stanford and other places where this was a real question. Stanford was one of the first to actually set up a department of computer science.

DAILY: What were the arguments on both sides with that?

KURTZ: Well, the argument against it is that computer science is really either engineering or it is a branch of mathematics. The theoretical side is a branch of mathematics, which it is, and the engineering side deals with hardware and stuff like that. The counter-argument was "Yeah, but it is such an important area that people need to be judged by their professional peers and, you know, are they going to get published and this sort of thing."

I know that in the early days of computing, Dartmouth had people who were…you might call them computer scientists and then their tenure review comes up. "Well, he's not a

mathematician. This isn't mathematics." So it was a tough go. Even if you are sympathetic to the idea, it is a tough call.

I remember Victor McGee, who has since just retired from Tuck School. He was a…I guess I would describe him as a quantitative psychologist, a Ph.D. from Princeton. He was very much interested in quantitative-type stuff, statistics originally and then other stuff like that. He came up here and he was at the psychology department for a couple of years and then he came up for tenure. The psychologists said, "Well, he's not a psychologist. He is a mathematician," because he did all of this mathematical stuff. So that's what their thought was. "If he does statistics, he must be a mathematician." And the math department says, "Well, this statistics is pretty applied stuff. He is really a psychologist." So what he did was very brilliant. He got himself hired at Tuck School and he taught the quantitative courses, of course, and he did some really original work in statistics.

DAILY: So you work in the math department, you are directing Kiewit… How do I want to phrase this?

KURTZ: I taught…

DAILY: Were you getting away from teaching or was it taking up most of your time?

KURTZ: No. I taught one or two courses a year. I don't remember. From time to time, we had people doing statistics courses. See, my field was statistics, not computer science. So we had people teaching the statistics courses. During that period, I didn't teach the stat courses.

Then we had, as the demand or interest of the students in computing-related stuff…We developed a series of courses in the math department. I think we actually had a computer science concentration area that a student could -- an undergraduate -- could elect.

I taught some of the beginning courses in that Introduction to Programming. I think I taught Pascal. I taught a machine language course on a PDP machine once, maybe twice, stuff like that. I always taught the numerical analysis course, or almost always, because there wasn't anybody else on campus

that could do that. There was a time when that course was also a required graduate course in the engineering school, even though it had undergraduate numbers. Students were required to know something about numerical analysis and, if they didn't know anything, they had to take this course. So I had a goodly number of students in classes. So I did teach all through that time.

You know, the fact is that Tom Byrne did all of the day-to-day administrative stuff because I have never been an administrator. So most of my time in the computer center of course -- I think I made three decisions in ten years [Laughter] -- was going to meetings and trying to promote Dartmouth time sharing and Dartmouth computing, the virtues of time sharing, at other places and I was completely unsuccessful. If you've got an IBM computer, you ignore everybody else.

DAILY: Wow. Really?

KURTZ: But those were fun years.

DAILY: Why don't we go ahead and break right here.

[Break]

DAILY: Okay. To change focus here from computing and math to the broader campus, what kind of recollections do you have of the student protests and how…One of the questions I have asked people in the sciences was, did you feel any threat to the laboratories or did they feel a threat to the laboratories from the students protests? Did you feel any kind of threat to the computing center?

KURTZ: No. I can tell you some little vignettes from that era.

Okay. It was 1969 I think that was the general year of the SDS-led protests and there was that and, later on, there was the Kent State thing that Kemeny was involved in when he was president. That would have been in '72, I guess. He had just been president when Kent State happened. That didn't involve computing at all. I know a couple of interesting vignettes about that.

Okay. The SDS in 1969…We were in Kiewit and we were running regularly. We were well established and so on and the students used the computers and all of that. One of our student programmers -- Danny Relles [Daniel A. Relles '64] I think was his name. I'm not positive -- was a member of this SDS group. So they were plotting their strategy and what should they do. It was decided…Somebody suggested that they occupy the computer center. The other members of the group said "No. That's a student favorite. You don't want to do anything against the students. We want to do it against…" So they never occupied the computer center because the computer center was so popularly accepted by the students as something that was a good thing, not a bad thing. I dare say that at any other university, that view would not have been expressed.

Another vignette about that…We had a machine operator at that time named Henry Schramm [Henry Robert Schramm]. He is retired and he is living in Enfield somewhere now. He is a retired marine sergeant. He was on Guadeloupe Canal in the Pacific War which was very ugly. [Narrator's note: Actually, he was in Okinawa.] That was a very ugly situation. At any rate, he was looking for a job at the time that we were looking for someone to help us. This would have been in the summer of 1965, before we moved into Kiewit. We needed somebody and here he was. We hired him. That was done in those days. You know, you just hired the first guy who came in. Anyway, Henry was a very valuable employee and he was the machine room operator. He was the guy who stood there in the center of the glass enclosed room and loaded the tapes and pressed the buttons and that sort of thing. So the student protest movement is coming on and I went in. I made an expressed point of going in to Henry and I said, "Look Henry, if the students occupy the computer center, just walk out the back door. Do not defend the computer center." I could imagine him setting up a machine gun nest." [Laughter] And to his credit with his background in the military, if somebody tells him to do something, they do it. They don't give you arguments. You know, that was the beauty of working with Henry Schramm. He had been a marine sergeant and Gene Fucci, who had been an air force officer. So we were really never deeply involved in the student protest business.

DAILY: Now beyond computing, what are some of your recollections and really kind of vivid memories of the Parkhurst takeover and things like that.

KURTZ: Okay. One thing that I remember very well…I think I must have heard this from Kemeny as a matter of fact. Dickey was, of course, president. This is 1969. That's right. I am apt to confuse the Kent State thing with the SDS thing. I think this is in '69 when they actually did occupy Parkhurst.

Now the business at that time was that the college appealed to the State of New Hampshire or something like that…the courts. The court issued an injunction to the students that they should not occupy Parkhurst. So it was a court injunction. It wasn't a violation or a crime. It was a court injunction. As you know, there is no penalty for court injunctions.   You can go to jail for as long as you don't obey the injunction. Right?

DAILY: Right.

KURTZ: At any rate, what happened next was the sheriff of Grafton County had the job of whatever it was, carrying out this court injunction. Obviously, he couldn't do it; so they called in the state police. The nice thing that happened was that Walter Peterson [Governor Walter Peterson '47] was Governor of New Hampshire at the time. Have you heard this story?

DAILY: Different pieces of it, so let's keep going here.

KURTZ: He met with the state police before they were going to go in and bodily carry out the students as we had seen so much on television. He gave them a little talk. He said, "I know you are scared about this. They are just scared kids, too. So just be gentle and do your job. Just don't get…" or whatever he said.

I don't know, but it worked like a charm and the students were carried away. Of course, they were arrested because they were violating a court injunction and they went up to jail in Grafton County in Haverhill. Of course, all their professors…Professors of any students who were missing classes, they sent homework stuff up to them so they continued their courses while they were in jail in Haverhill. So it was a very gentle thing. It wasn't Kent State-ish at all. So that was a plus for Dickey and Governor Peterson.

DAILY: Speaking of John Dickey, you said he had given John Kemeny basically a blank check to do what he needed with computing.

KURTZ: Well, I would say he supported him, partly because Kemeny did his homework. He made sure everybody knew what was going on. So there were no surprises.

DAILY: You had mentioned earlier that you had some stories that you wanted to share about John Dickey before we move into John Kemeny's presidency.

KURTZ: Well, that was one of them. The SDS thing. I think that John Dickey was supportive of the attempt to do graduate work, but that didn't happen until, that did happen then, didn't it? Before Kemeny?

What motivated John Dickey to resign when he did was the faculty controversy over the ROTC. He had a hard time dealing with that because that seemed like a non-issue. The faculty, you know…What you might call the "left wing" members of the faculty were really making a big fuss about ROTC. It was a very ugly time for John Dickey because he, as president, he chaired faculty meetings. You know, the president chairs the faculty meetings. I think that was the thing that motivated him to leave as he did. He retired in '69 [Narrator's note: wrong.]. He announced his retirement shortly after that.

DAILY: Right. Then the search goes on for…

KURTZ: That was in the early '70s.

DAILY: …the new president, which eventually is John Kemeny. I have heard different pieces of this and one of the things I am interested in asking you is when did John Kemeny know he was being looked at for the presidency? Did he ever share that with you?

KURTZ: No. He never shared that. I do remember one conversation we had when Leonard Rieser had been made provost. He thought the wrong choice had been made. He thought he, John Kemeny, should have been provost and Leonard Rieser should have been dean of the faculty because they need slightly different personalities. I think Kemeny was right. So Kemeny

never was dean of the faculty or provost, but he was very deeply involved in Dartmouth activities, fundraising activities and I don't know all what else. You know, the three-term, three-course system that came from his educational policy committee and so forth and so on.

He must have applied for the presidency. I don't know who the contenders were, but I do know that the trustee vote was unanimous. One trustee, whose name I don't know, actually got out of a sick bed to go to a meeting in Boston -- where they were meeting in Boston -- to vote for Kemeny.

DAILY: Okay. I've not heard that before.

KURTZ: To know John is to love him. If you didn't know him, you would think he is a…I don't know what. He seemed humorless and, to the outsider, he seemed like a technocrat. One thing that he believed…He believed that all human relations problems could be solved by shuffling people around. I am trying to think of instances where that was done, moving, laterally transferring somebody. But that's not true. If somebody is a real nerd, you have got to get rid of him. Right?

DAILY: Right.

KURTZ: Here is a story that I don't know if anybody else has told. When John became president, Dickey said to him -- allegedly -- all of this stuff is hearsay. He allegedly said to him, "You can do anything you want, but don't fire Carroll Brewster." Have you heard this story?

DAILY: No. I haven't.

KURTZ: Carroll Brewster was dean of the college at that time. I had talked to John or John tells the story that, during that particular period -- what Carroll Brewster did -- he was the "buttering up" type. He would butter up to people and he would go to the members of the board of trustees on some issues -- I don't know what the issues were -- and bypass the president. All right? To feather his own reputation or whatever. I don't know. This is all…I am just guessing.

DAILY: This is what John told you?

KURTZ: No. This is what I am surmising.

DAILY: Okay.

KURTZ: John told me that he would go to members of the board of trustees. Okay. That he did tell me. That is sort of a 'no no'. You just don't do that. So it was clear that John had to do something about it. What he did, I think, for this purpose…

People from a management consulting firm came in to look over the administration and what they recommended was kind of a stupid idea. They recommended that he appoint a number of vice presidents. So he appointed Ruth Adams, vice president for women's affairs, because coeducation was coming in. So one year later he appointed her vice president. Vice president for administration, vice president for this and that. So, for a period of time, he had a bunch of vice presidents, rather than directors. So he hired… He asked Don Kreider to be vice president and dean of student affairs. Then the dean of the college, i.e., Carroll Brewster, would report to Don Kreider, so a little lateral transfer. I am sure that was done with that purpose in mind. But at any rate, Carroll Brewster left a couple of years later and became president of that women's college in Virginia. Hollins? Is that right?

DAILY: It sounds right.

KURTZ: We visited down there as a matter of fact. John Kemeny was really not capable of firing people.

DAILY: That's what I have heard.

KURTZ: He couldn't do it. He tried to solve the personnel problems by realigning the organizational structure. So, to that extent, he was a technocrat. He probably should have fired me somewhere along the line…[Laughter]…but he never did. He couldn't bring himself to do it. So, let's see, the general topic was how he became president?

DAILY: Yes. I was curious how much you knew of the kind of those inner workings of…

KURTZ: I didn't know much because I was never involved in campus politics. I never served in an administrative capacity. I was the

chair of a program once, but that didn't mean anything. I was never an elected member of a faculty committee. I shied away and still do from any bureaucratic, political stuff. So I really didn't know much about what was going on. I only knew it in retrospect.

The first thing Kemeny had to deal with when he became president was Kent State. Of course, he came out with the technocratic solution; namely, declare that the students would get credit for the spring term, whether they were here or not. And he got his vice presidents, deans… He had a committee which was called the committee of deans or something like that which he ran things by. He was very careful to touch base with everybody, so that it wouldn't look like he was bypassing anybody. He got his committee to agree that that was a good idea and that's what happened.

DAILY: Okay. What was the mood among the faculty when he was selected? Was there hope that the College would go in a certain direction once he was…

KURTZ: Well, I think that the humanities and social sciences -- certainly in humanities -- felt that he was going to favor computing and science, but he didn't. In fact, he leaned over backwards not to. Now I can't give you any specifics on this like in terms of salaries and appointments and things like that, but he did…

End Tape 2, Side B
Begin Tape 3, Side A

DAILY: Looking through your recollections about John Kemeny, let's begin with coeducation. What were your own feelings about coeducation and how much had you and John talked about it?

KURTZ: I don't remember having talked about it at all. I had never…Dartmouth was the only place I had ever taught so I had never had a woman in my class. You know, it was… The concept was foreign at the time. Many other schools had gone to coeducation. Of course, I went to a coeducational college at Knox and they were coeducational in I think 18 -- whatever -- twelve years after Oberlin became the first.

DAILY: That was early on.

KURTZ: Knox was very early on. They abolished their female seminary and became coeducational.

I don't remember what my thoughts were. I certainly wasn't against it. I am not sure I was wildly in favor of it. I was just, you know, a teacher. I was just a little computer programming guy. So I didn't have any strong feelings one way or the other.

I do remember that there was a proposal to go to coeducation and John Kemeny came up with the idea of a coordinated school. That was always an issue raised at Princeton and all those schools that didn't have it. You know, Brown had Pembroke and Harvard had Radcliffe. That was the model; therefore, Dartmouth should have "x" across the river in Vermont or something like that. So he proposed that.

Now, to this day -- I should have asked Jean Kemeny about this -- to this day, I don't know whether he put it up as a 'straw man' or whether he really believed it. It was presented by some committee or something. He didn't present it himself because he was chairing the meeting at a faculty meeting and gradually, as the meeting went on, faculty members said, "No. This has to be a complete mission…. students…" They just didn't see any other way to do it and he embraced that idea. So I think he really proposed that as a straw man.

As I said, he always believed in technical solutions. If you could have a coordinated college, maybe you would have all of the advantages of coeducation without the disadvantages and the disgrumbling and all of that.

He did tell me a story about his retirement as president. No, it wasn't that. It was during his presidency. Each year or every couple of years, the term trustees leave the board and it is usually, you know, a tearful time. "I love Dartmouth" and this kind of thing. This particular trustee and I will tell his name because it is not a derogatory story at all. It was David Smith [David Parkhurst "Dave" Smith '35]. He got -- instead of saying you know this blah, blah, blah about how they love Dartmouth and enjoyed working, he said, "John, when coeducation came up, I opposed it. I was wrong. I have just established the John and Jean Kemeny Professorship," or words to that effect. John was just flabbergasted. It really grabbed him.

DAILY: Wow. That is interesting because you never…As we have collected the different accounts of the board's decision for coeducation, you know, the formal vote was unanimous, but you know that there was dissent but you never know who the dissenters were.

KURTZ: It wasn't unanimous.

DAILY: When they presented it publicly?

KURTZ: Well, I don't know. Maybe they did.

DAILY: Let's just dig into that because my understanding…

KURTZ: I don't know. Remember, all my stories are like second or third-hand.

DAILY: Okay. Well, I could also start getting my own facts mixed up here, too.

KURTZ: I was just talking the other day to a Dartmouth alum who was playing bridge and he was the class of -- I don't know -- '38 or something. He is an older man and my wife… She was playing with me and, of course, she was the first female coach at Dartmouth that came in. You know, she has all the arrows in her back. So she said to him something about... The subject of Dartmouth or coeducation came up. She said, "You know, I was the first women's coach, so you should really not like me. I mean, you were against coeducation." He said, "Oh, no. I wasn't against coeducation." [Laughter] "I have a daughter who wanted to go to Dartmouth." So it is that kind of thing. That was almost universal. I mean the alums…almost all alums had a daughter or a niece or something -- a female who -- what a great idea to send her to Dartmouth.

DAILY: So that kind of made…

KURTZ: So the disgruntledness was very few and far between. Also, I don't know if this applies to coeducation. Yes, it does. I think it applies to coeducation, but Dartmouth had a couple of dips in their fundraising over the years for various publicity things like 'Animal House' and coeducation and so on. You would get these letters and the guy would say "I'm going to reduce my alumni fund contribution." Well, he didn't give much anyhow, so

what's the problem? I don't think there was that much diminution in alumni support there for that decision.

It is certainly true that the alumni don't give a tinker's damn about football. One or two of them do, but it is a myth. It is a myth. I mean Dartmouth is not the University of Miami or the University of Alabama. So, you are a Dartmouth alum? Do you care about the football?

DAILY: No. I didn't go to Dartmouth.

KURTZ: Oh, didn't you?

DAILY: No. While we are on the topic of sports here, the Indian symbol. John had to deal with coeducation and then he had to deal with the backlash of…

KURTZ: John, when he became president, one of the things he decided to do was to reinstate the old "for the education of Indians," you know, "and for English youth and any others." He decided to pick up that Indian thing because it had languished over the years. There just weren't very many Native American graduates from Dartmouth after Samson P. Occum. So he really put a lot of effort into that in terms of recruiting from reservations. I don't know what all he did.

If you want to hear a good statement about that, listen to the video tape of his memorial service. Michael Dorris spoke for twenty or twenty-five minutes on it. John was really serious about this. At one point, Michael Dorris and a bunch of other Native Americans came to the president's house and complained about something that he did or did not do. He was just shaken. He said afterwards that he was almost crying. He said to Jean, "What have I done wrong?"

You know, he was a victim of persecution himself. He got out of Hungary in 1938 with his parents…his father. I think his mother had already been here. No. His father was already in the States. He got out with his parents and sister and their luggage didn't make it on the subsequent trip. So he understands that really well and so, when the issue of the Indian symbol came up, it was a no-brainer for him.

I remember -- I was on a freshman trip as a leader, never as a student -- one year and we always ended up at Mt. Moosilauke at the Ravine Lodge. We had a big feed. There would be about sixty, eighty freshmen and their leaders and so on. The president always came up. Dickey always came up. You know, Dickey was an outdoors man. He would show up. He used to go hunting and fishing with Sherman Adams and those guys. Plaid shirt and all this stuff.

Well, Kemeny showed up and he had a plaid shirt. [Laughter] It was the funniest thing, this little guy walking in with a plaid shirt. So, at any rate, he sat at the table and somebody said something about the Indian symbol. "What's wrong with that?" He delivered -- I don't remember his exact words -- but they were typical of people who were sensitive about this. "How would you like to be, you know, made a symbol?" He really felt quite strongly about that. There was no question as to how that was going to go.

DAILY: Going back to coeducation, one of the things I was curious about… Was computer science and math attracting many of the early women? Or maybe I should say were the early women going into those courses beyond what was required?

KURTZ: No.

DAILY: Okay.

KURTZ: I mean there were some, but if you look at the percentages, they were less. They've always been less and they are even less now.

DAILY: Okay. Any recollections of the early women students in your courses that stand out? Any issues or anything like that?

KURTZ: No.

DAILY: Okay.

KURTZ: I don't, as a matter of fact. I do remember my own situation. What do I do when a female comes into my office and starts to cry? What do I do? My first wife said, "Just have a box of Kleenex handy." [Laughter] Later on, Don Kreider had a very good way of dealing with students who came for office hours.

He said, "If the student appears to need help, you should appear to give him help." [Laughter] I never had any trouble with that.

I think a much more serious problem at Dartmouth over the years was the so-called 'grade inflation' thing. The grades don't mean anything anymore. If a student gets a 'B', they think, you know, this eliminates their chance of getting into the graduate school of their choice.

DAILY: When do you think that really started to happen here at Dartmouth?

KURTZ: I don't know. I don't really have much of a feeling about that because I was involved in the Computing Center until '75. I had some other stuff going until '78 and then I was involved with the CIS program from '79 on. So I don't really have a strong feeling about that.

But over the years, students have become much more serious in terms of being grade conscious. I don't know if this is good or bad. You would have to talk to sociologists about that.

DAILY: John was asked to go off and head the Three Mile Island Commission. How did the campus function at that point without him being, you know, actively on campus?

KURTZ: Well, I think it functioned just fine. The university is such that, you know, it is a big bureaucratic organization and things function. It is like the British civil service. They function regardless of who is at the head.

I do remember one story. John told me about it. I think Dave McLaughlin was chairman of the board at the time. John went to Dave and said, "I have been asked by President Carter to do this. What should I do? I don't want to leave the campus." Dave said, it is reputed that he said, "When the president asks you to do something, you do it." End of discussion. So, you know, the provost -- by that time I think they were back to provosts -- but at any rate, the campus officers handled stuff.

DAILY;   Did John Kemeny ever talk to you about what was going on at the Commission while he was leading it?

KURTZ: I don't think so because he was out of town a lot. I remember some vignettes from it. I had heard from other people that this was the only time in the history of the United States that a commission report was ever delivered on time and was readable. [Laughter] I do know that Bruce Babbitt, governor of Arizona or some place at the time, was on the Commission. John and Jean said, "You ought to try running for president of the United States." Of course, he did try to run for president. In the United States, the top 100 people most qualified to be president wouldn't even consider taking the job. [Laughter]

DAILY: That's right.

KURTZ: I remember meeting…Did I meet Bruce Babbitt? I don't remember. No. I met his wife. I guess he wasn't up here. A candidates' meeting we went to…I don't remember much of anything else about the Three Mile Island thing.

DAILY: Okay. How would you characterize John Kemeny's leadership style and maybe using John Dickey's style as a backdrop?

KURTZ: Well, I didn't know much about John Dickey's leadership style. He was tall, of course. He had a very good voice. He was looked up to and admired and all of that.

John Kemeny's leadership style was to make sure that all of the ducks were in order. He never went into anything cold. Just as an example, when he was chairman of the math department and he wanted to do a certain thing, he knew how to manage a meeting. Meetings are unproductive unless there is a focus and he would provide a focus by distributing a memo ahead of time as to what he wanted to do. A standard technique. I think we all know how to do it and then, at the meeting, people would throw darts at his memo; but that was it. In the end, they would vote to approve it. He was very careful in that respect to make sure that things went his way through careful preparation.

When he ran for the school board in Hanover…He served a term. Before he actually started -- maybe even before he ran -- he got the minutes of the old meetings; he read them back for ten or twenty years. Nobody else does that. They go in cold. They learn on-the-job training, you know. But he really studied. He did his homework and he was always one to do his

homework. So that was just the main thing about his leadership style.

As I said and as you know, he couldn't fire anybody, so…

DAILY: I have heard in the faculty meeting that, if the direction of the meeting was going in a way that he didn't want it to go, he would basically use a parliamentary procedure to kind of squash it and then they could revisit it the next meeting. Do you recall that?

KURTZ: I don't recall any instances of that. I do recall…this is much later and involved Jim Wright [James "Jim" Wright], a very positive thing about Jim Wright. It was a faculty meeting that had to do with "should we go back to the semester system from the three-term system"?   Habitually, the faculty…and they managed to raise this issue regularly…and there was this…there was beginning to be a little bit of a contentious argument. Science in favor…always had been in favor of the three-term system. Social science are ambivalent. Some like it; some don't. Humanities have always been against it. They had their own reasons for so doing. At this meeting, Bernie Gert [Bernard "Bernie" Gert] got up and said something about the humanities division. "We work hard", he said, "We work hard in the humanities division." Jim Wright popped up. You know he is about 6 foot 2. He said…he didn't even ask to be recognized. He said, "We all work hard." [Laughter]

DAILY: And that was the end of that.

KURTZ: He was always right there. I have always had great respect for Jim Wright. He was just a history professor at the time. He wasn't a dean or anything. So leadership style…John would rely on committees. Again, that was part of his style to get everybody involved, not consensus. I don't think I would view it that way, but to make sure all of the people who might have a view on the subject had a chance to express their views on it. So he used committees a lot -- committee recommendations -- a lot. It is not hard to get committees to go along with you. You do your preparation and the committee has no alternative but to, you know…they don't want to do the work to develop a counter-proposal. So all they do is argue against yours, but then they approve it in the end. He did use committees.

DAILY: It is interesting that you said using committees, but he didn't necessarily lead by consensus. I have heard bits and pieces of this and I am now starting to piece it together in terms of how, you know, it wasn't necessarily by consensus but he certainly involved people. Okay. That's good because that kind of flushes that out a little bit.

KURTZ: There were two things that Kemeny had -- the qualities that he had as president -- which were completely unpredictable from the beginning. One is that he had excellent alumni relations. The reason was he leveled with them instead of…I don't think Dickey was in any way lacking in this; but, generally speaking, college presidents in talking with alumni are condescending. Kemeny was never that way and they really appreciated it.

The other thing that Kemeny did as a president, he regularized the financial structure of the institution. Before that, under Dickey, it was John Meck…in John Meck's head. There were all of these little piles of money floating around and so on. So when they wanted to do something, of course, they always had a little pot of money to go into. But John Kemeny instituted a system of budgeting -- a university-wide system of budgeting -- So that was… Both of those things would have been completely unpredictable from his background.

DAILY: From his background and things that did occur, what was predictable in terms of what his vision was and how…let me rephrase that. How well stated was his vision for the college as he started the presidency and then how well do you think he was able to do…

KURTZ: Well, I don't know what his vision for the college was. You know, politicians come in and "we are going to straighten out the state government."   Come on. Give me a break.

I think John Kemeny did two important things. One is he did coeducation right, as well as Dartmouth could have done. Admittedly, there were little glitches here and there; but it was better planned than it was at Princeton incidentally. I can't give you too many instances, but that's what I have heard and that's what I believe. The second thing he did was he really revitalized Dartmouth's commitment to Native Americans in the widest sense. I mean, it includes Inuits. So, you know, it is now part of

Dartmouth's admissions policy to really look for students among these other groups. So that's Kemeny.

DAILY: Are there things that you knew of or know of now that he wanted to do that he just wasn't able to get done for financial constraints or for political reasons?

KURTZ: No. I can't think of anything.

DAILY: Okay.

KURTZ: I do know that he never thought highly of Dave McLaughlin and Dave McLaughlin never thought highly of John Kemeny.

DAILY: Okay.

KURTZ: At Paul Paganucci's [Paul Paganucci '53 TU '54] funeral, David McLaughlin told how Paul came to him as…when McLaughlin was president. I think he was president at the time that the medical center moved. Paul Paganucci convinced him, Dave McLaughlin -- they were buddies, by the way, as undergraduates -- that the finances were right to move the medical center. Of course it was moved and it was a financial success. I remember talking with Bob Field once about it. Because it was done at a slight recession time in the economy and they did it on time and under budget.

But at Paul Paganucci's funeral, Dave McLaughlin mentioned this story and he mentioned that the subject had come up with the previous president -- that was the way he put it -- and the previous president went to the blackboard and outlined…He wrote numbers down to show why it was impossible. But the way he talked about it suggested that he didn't really think much of the previous president. I know that the previous president didn't…McLaughlin's election was not unanimous.

DAILY: Right.

KURTZ: I will tell you one story about that and then we should exorcise it from the tape if you decide to do that. When Dave and -- what's his wife's name?

DAILY: Judy.

KURTZ: Judy. When Judy McLaughlin moved into the president's house on Webster Avenue, they treated the staff as staff. John and Jean treated them as members of the family. And they quit. Doug [Douglas H. "Doug" McBain], who was the driver…I don't know if you met him. He was the gardener and the driver. He drove the Cadillac when it needed to be driven anywhere. He quit.

So there was a big difference in their personal relationships. As Ed Bradley said, "Dave, you are an affable fellow", but he is a snob. And John and Jean were never that way. Jean was born in Burlington, Vermont and grew up in Maine and has always been, you know, a down home person.

Of course, John, with his background, he decided… When he was in Princeton, he was an assistant to Einstein [Albert Einstein] and he knew Johnny Von Neumann, who was one of the great American scientists who came over from Hungary in the '30's. He observed…Kemeny observed that both Einstein and Von Neumann -- brilliant as they were -- they were always kind and open to anybody who walked up to them. People would call Einstein -- students and the principal would call Einstein on the phone with a calculus problem and Einstein would answer. He didn't play the hoity-toity bit. Johnny Von Neumann was the same way and Kemeny decided at a very early age that he was going to get through life by being nice and, you know, be nice to people. He wasn't going to be nasty to people. That certainly was a key in the whole way he dealt with everybody.

DAILY: That's a good recollection. I like that. Let's go ahead and break here for just a minute.

End Tape 3, Side A
Tape 3, Side B – Blank
Begin Tape 4, Side A

DAILY: Today is July 2, 2002 and I am speaking again with Professor Emeritus Tom Kurtz.

We talked a lot about computing and John Kemeny, BASIC and the development of computing at Dartmouth last week. I would like to follow up a little bit more with John Kemeny and how you would characterize his leadership style.

KURTZ: First of all, of course we knew him for thirteen years as the math department chairman and then as president. He was extremely well prepared. I think I mentioned that when he ran for the school board or when he was elected to the school board, he read the minutes for the last five or six years…of the school board meetings. Now nobody does that.

Whenever there was something coming up in the department meeting, like introduction of a new course or requirements for majors or something like that -- any policy thing -- he always made sure he had a memo out ahead of time. You know, that is a standard way to guide the flow of the discussion because you find that people take pot shots at the memo that is coming out rather than discussing the philosophies. So he was very well prepared.

On the other hand, he was very open-minded and, if somebody came up with a better idea or had a criticism that was justified, he didn't have any problem with going on with that. As I said, he was very…I am trying to think of the right word…he really cared about people and he was not, he never over-lorded them. If there was an important issue coming up…I think there was one on coeducation at one time after women were admitted and he attended a meeting at the gym. I don't know what went on. I have no idea. So he was obviously pitching some important things that he had in mind about equality for women and all of that and he can be quite persuasive on that type of issue.

He made great effort early in his presidency to revive -- and was successful as far as I can see -- the recruitment and admission of Native Americans of all types including…I had -- one year I was a freshman advisor and I had an Inuit from Greenland, so that was casting a wide net for Native Americans, but it follows on the charter of Dartmouth College. Up until that time, until Kemeny's efforts, not much had been done. So he really felt strongly about these things. After all, he was Jewish and he escaped from Europe luckily…almost at the last minute in 1938 or '39 from Hungary, so he is very conscious about that.

Now Dave McLaughlin's management style…I didn't really know much about it, but several…there were several encounters that I had with him and what…Dave could be persuaded. He actually did a favor for my wife [Agnes B. Kurtz] once. It involved a

member of her team who had been accused of cheating on an exam and, in the subsequent CCSC [College Committee on Standing & Conduct], I think they called it…The committee that dealt with that kind of stuff, they convicted her and the sentence was a two-term suspension. So we went…it happened that the student was from Nigeria…so my wife and I went to that…made an appointment with Dave McLaughlin. We went to see him and pointed out that it was really an unduly severe hardship for her to be absent from campus for two terms. What could she do? Whereas the winter term was almost all over by the time the CCSC got around to making their decision, so she had been suspended for the winter term, *ex post facto* almost. So he did the only thing he could do as a favor to us. He changed the sentence from two terms to one term suspension so she was able to pick up her studies in the spring term. Then I think she stayed a little while in the summer or something like that. At any rate, she graduated more or less on schedule. He was very receptive to that type of thing.

I remember there was a thing that happened in the athletic department about that same time. George Crowe was the hockey coach and I may have mentioned this. As parents do if their kid doesn't get the playing time that they think they deserve…well, in any case, there were some incidents like that.

There was something. George Crowe [George E. Crowe] was a great hockey coach. Perfect? I don't know, but he was a great hockey coach and he coached the women's team subsequently. He coached the women's team for many years and did quite well. But, at any rate, certain parents complained. I am sure they complained to the athletic director and the athletic director, of course, it is his primary job to tell such complainants to 'forget it' to protect the coaches. So then they went to the president. The president listened to them and I guess he agreed with what he heard, based on no evidence to the contrary.

We believe that he asked Seaver Peters [Seaver "Pete" Peters '54] to fire George Crowe. And Seaver said "no". We believe this, but I don't know if it is true because it is second-hand knowledge. A year later, Seaver resigned, perhaps under pressure. I don't know. Dave was that way. If people opposed him, you made the enemy's list. It was like Nixon's [President Richard M. Nixon] enemies' list. I believe I mentioned some things about that.

I don't know if I mentioned that we heard, again, that Ralph Manuel's [Ralph N. Manuel '58] tenure as the dean of freshmen was made untenable because he had a disagreement with Dave McLaughlin and Ralph said, "Look, you know, we disagree. You make the decision. I support your decision." But the way we had heard it -- my wife and I had heard it -- is that McLaughlin is not forgiving. It sort of reminds one of Nixon …the enemies type of thing. Now Kemeny would have never…that was so far away. I mean the two guys are really diametrically opposite…quite different.

Other than that, I remember one time…I think I was actually in a meeting with McLaughlin and Dwight Lahr and why I was there, I haven't the slightest idea because I was just the program chair at the time. Dwight was explaining to Dave -- this is a very vague recollection -- about the faculty not liking this, that or whatever it is and taking a vote and so on and so forth. Dave said, "Who are the ring leaders?" Of course, Dwight Lahr said, "I can't tell you that." So, again, Dave wanted to know who his enemies were. So it is completely different styles.

As I told you briefly last week -- or two weeks ago -- that we had this face-to-face confrontation between the program chairs and President McLaughlin in the Wheelock Room over lunch. I think it was Ed Bradley [Edward M. Bradley] who got up and said, "You are an affable fellow, Dave, but…" And he was. He was a very nice fellow.

I still see him. He lives in the area and I see him at various events. The most recent one was the retirement of Dick Jaeger [Richard G. Jaeger '59] in the Top of the Hop. Let's see…the other, of course, was Paul Paganucci's funeral. We spoke and so on. He's around.

From what I heard, his election as president was not unanimous. The vote from the trustees was not unanimous; whereas Kemeny's was.

In fact, John Kemeny used to…He never bragged. He let his record speak for itself. He said that he was very pleased that one of the trustees at the time of Kemeny's election for president actually got out of a sick bed and came to the meeting

62

so he could vote for him. I don't know who it was. But Kemeny inspired. Anybody who knew him loved him.

If you didn't know him, here was this funny guy who speaks funny and so on. He appeared to be aloof, but that was because he was not a 'hail fellow, well met' type of guy…a backslapper or anything like that. In fact, I am sure he was comfortable when he was doing his job…alumni meetings and making speeches and so on because that was part of his job, but he never was much of a party guy.

I knew John for just about as long as anybody here at Dartmouth. He was never 'one of the boys', whereas a guy like Jim Wright is one of the guys, you know. But, with John, you always felt that you had to…Well, somehow he was up there on this plateau, a little higher than the rest of us. Not that he…He wasn't monarchical. I am reading about the American Revolution and I picked up that word, monarchical. He wasn't like that, but he just seemed aloof. He tried to be part of the campus and would go to the Moosilauke Ravine Lodge during freshman week. You know that was something that John Dickey did. He was an outdoorsman anyhow. I don't know if John Kemeny ever tried to help with the bonfire or building the center of campus statue. I think John Dickey might have.

DAILY: I know Dave McLaughlin did with the sculpting and things like that.

KURTZ: Right. That covers, I think, the main points that I have still remaining in my disappearing memory.

DAILY: The one thing I wanted to pick up on your discussion with John Kemeny was, do you think Jean helped him kind of, I am going to just say relax and kind of mingle with folks more?

KURTZ: Absolutely. Oh, absolutely.

DAILY: …what her influence on him was would be a better question.

KURTZ: Yeah. He shared everything with her. He was the kind of guy…He didn't bear stuff internally the way a lot of people do and if something went awry, he would unload with her and they would talk it out and excoriate the evil person who did it...whatever his [inaudible] ...and hash it out. In fact, at one

point, he made the suggestion that the wife of the college president ought to be on salary, too, because she works just as hard as the president. So they really were a team.

Let's see. I think there was one event at a Dartmouth Club somewhere… I am thinking of two Dartmouth Club things. One is in Cleveland, of course, where the club was in the habit of meeting in a venue which, like a Union League Club or something like that where they didn't admit Jews. So Kemeny laid down the law. "Get out of there." No questions asked. Not even a discussion. John had been scheduled to speak to alumni in that club. When he found out, they had to change the venue.

What I am thinking of is a time when there was something that he had to go to -- an alumni thing or something like that -- where there was men only. I think he said, "If Jean can't come, I'll refuse," or something like that. He was quite adamant about that. So certain principles he would not budge on, you know, equality of sexes and people and all of that kind of stuff. He just wouldn't budge on that.

DAILY: Who do you think John Kemeny would have counted as kind of his confidants on campus beyond Jean?

KURTZ: That's hard to say because a lot of people had close relationships with him. I like to put it this way. I had only one person on campus that I worked closely with and that was Kemeny; but Kemeny worked closely with lots of people. He worked with me on computing stuff until he got involved with the presidency. He worked with J. Laurie Snell on probability. They were doing probability research and, even as president, he would spend a half a day or a day a week with Laurie Snell working on some probability research. He must have had other people, although I am not aware of it.

He might have confided a lot in Lu Martin because Lu Martin I think at that time was special assistant to the president or something like that. Subsequently she became head of the major gifts area in the fundraising department. She might have been the first, second or third secretary or something like that. I remember that…I think I was…Kemeny came in in '72 and right away coeducation came in …it was '70, '71.

I don't remember; but right away, coeducation was big and so coeducation came. He had some assistants. Alex Fanelli [Alexander "Alex" Fanelli '42] was going back to the Dickey days and Alex Fanelli was one. Who was the other one? I forget his name. The person I am trying to think of I guess couldn't hack...was not really comfortable with coeducation. Kemeny had to get rid of him and, as I explained before, what he did is create new slots. He did a lot of horizontal transferring and he put this man -- it's not a secret, it's just I can't think of his name -- in charge of the initial Dartmouth Institute.

Kemeny started the Dartmouth Institute which was a vehicle for alumni and anybody else who wanted to come back and spend a summer getting a liberal arts education. It went for a while and finally faded out...quite recently, as a matter of fact. So this person was put in charge of the Dartmouth Institute to get him out of the president's office.

I guess I thought last night, thinking about the interview, I have one more story about myself that I have never told to anybody. In 1975, I was director of the computing center. We had a…the load on the computer was so great that people would come in at five minutes to eight or ten minutes to eight to try to sign in to get into the computer because there was a limit…no more than whatever the number was at a time. So I made a proposal that we get more -- it was Honeywell or General Electric – hardware that we buy more hardware. We had a Computer Council.

I went to Kemeny and said, "I think we should get more hardware. This is what it is going to cost." He said, "What about the Computer Council?" He believed in, you know, following the rules. The Computer Council was advisory, but the way we played it…the way I played it as computer center director, I did not think of it as a rubber-stamp operation. I encouraged them to be independent and they were independent. One of the members of the Computer Council said, "Well, I don't think we should get GE hardware. I think we should get DEC hardware." There was a big hoorah and the discussion made the student paper and so forth. At any rate, who me? I didn't know how to handle this. I probably didn't even bother trying.

So there was a meeting at Minary Center with my friends…Steve Garland, John McGeachie, John

Kemeny…probably Bob Hargraves [Robert F. Hargraves] because he was around then…yeah…probably Bob Hargraves and me and there may have been one or two others. Really what they were trying to get me to do was to resign.

DAILY: Including John Kemeny?

KURTZ: Well, just gentle persuasion. I didn't at that point, but I thought about it over the next week or two. Then I said, "Well, John really wants me to resign. He wants to appoint McGeachie as chairman…" You know, I could read John's mind. I mean, come on. So I went in and told John I was going to resign. He appointed McGeachie and McGeachie managed to finish the project and get the hardware. He was much more of a manager. I was never a manager. I have always been a teacher. So that is a case where John let things come to pass, rather than forcing the issue. I think that is another aspect of his personality.

DAILY: Moving ahead to Dave McLaughlin, what were his strengths or what were his accomplishments during his presidency?

KURTZ: Well, I don't really know. If he was successful as a fundraiser, you would have to look at the numbers. I know that…I think that he appointed a buddy of his as the vice president for development and that was not a good idea. But that's consistent with everything else that…so I really don't know. His relationships with the faculty were pretty meager. He attempted to re-institute the ROTC thing and that was another bone of contention with at least some elements in the faculty. I thought he did it reasonably well. What he did was say that there wouldn't be any uniforms on campus.   They would be over there somewhere, you know, at Norwich University or somewhere.

DAILY: Yes. They were going to work with Norwich.

KURTZ: So he had that. He was instrumental in bringing IBM back to the campus. I think I recited that story before. The engineering department wanted a…I forget the model number, but whatever the current IBM computer was, because they wanted to do simulation work on that computer. Fine. So, as a result, IBM personnel came back on campus after having been evicted in 1962 or '63. '63. That's not a big deal. Dave happened to

know one of the senior vice presidents at IBM, naturally being in business. So I don't know what Dave's accomplishments would be.

I do know what John Kemeny's were. He put the college on a sound financial basis. Before, the finances had been in John Meck's back pocket and he also did a fabulous job with the alumni. Kemeny did. He was the person who was at the helm during coeducation and I am sure he did as much as he possibly could to make that work. For example, he appointed a retired college president, Grace Bates, to be his vice president for -- I don't know what he called it -- women's affairs or some funny title. Her job really was to be the sounding board to tell him if something was wrong or whatever. She didn't have any administrative responsibilities as far as I know. Who did I say?

DAILY: You said Grace Bates.

KURTZ: No. That's not right.

DAILY: Do you mean Ruth Adams?

KURTZ: Ruth Adams. Right. Grace Bates was a Holyoke math instructor in the early days. She was one of the first persons to use Dartmouth time sharing off campus.

DAILY: Okay. I think I want to kind of move away from looking at the two presidents and talk more broadly about computing and dip back into the early '60s and kind of move towards where we are now and your views. Particularly, I am interested in your views on the influence of BASIC beyond Dartmouth. Why don't we start there?

KURTZ: Well, Dartmouth, of course, developed BASIC and BASIC became for a while the most widely used language in the world. I don't know how widely it is used now. I suppose most numerous locations would be using a visual BASIC of Microsoft, but then people are shifting to JAVA which happens to be more oriented toward browsers and internet applications. So I'm not sure BASIC influenced the world. In fact, I often had the feeling that we failed because what we tried to do was to make computing simple so that people who didn't use it everyday or were professionals or whatever could come back to it and they wouldn't have to look it up in the book. That hasn't happened in

the world today. The applications out there are so complex and they change so that you are really almost at a loss unless you use these things regularly, either as a professional or as a regular user. And I understand that. The way you make money is by coming out with upgrades every eighteen months full of errors so that you can claim eighteen months later that this fixes a whole bunch of bugs and get people suckered into buying the upgrades. That's the only way a software company can make money by the way. Because, if they made something that was perfect the first time, they would only sell one copy to everybody and that's it.

DAILY: And they would be out of business.

KURTZ: Out of business. Right. So you have to figure out some way of doing, you know, a steady revenue stream and you don't do that by doing a good job in software. So to that extent, we failed. I certainly failed within my own group -- the Ivy computer center directors -- in any of the utility of the type of time sharing that we were doing. The other places had some sort of crude timesharing; whatever would be permitted or would be suitable or practical on an IBM machine, which wasn't very much. It was pretty crude and pretty ugly and inefficient because we made the time sharing system so that it worked most efficiently for small users. None of the other timesharing operations that were being developed including MUTICS at MIT were efficient for small users. Their goals were, you know, their directions. So we failed on that score. You can say "Okay, the advent of personal computers essentially resolved that problem." It allowed everybody to hook up to a computer. Of course, we had nothing to do with the invention of personal computers or their widespread use. I don't know who gets the credit for that. I think it was just the economics of the beast dictated that. The prices kept coming down.

We did play a leadership role in being one of the first campuses to be entirely computerized with the Mac thing because we were already there. Not only were we already there conceptually, but we already had a network. We had the cable the coaxial cable network for the time sharing terminals, so it was pretty easy to build the backbone network to the MacIntosh. The MacIntosh was an easy choice by the way because (a) it used less power than the IBM offering; (b) it was a 32 bit machine, not a 16 bit machine and that means that you could put more memory on it

without changing the character of how it works, whereas the IBM was a 16 bit machine and you could add more memory to it, but you couldn't use it because the DOS operating system was 16 bit oriented. I think they have gotten away from that, but until recent years, I think as recently as four or five years ago. Microsoft's various Windows things were still, still had remnants of that 16 bit thinking in them. You know, file names had 8 characters in them and stuff like that. Then the third thing was that the MacIntosh had the built-in network hookup. You just plug something in the back, right. All the other machines, you had to buy some gadget or put a new -- what do you call it? -- put a card in or something like that.

So the decision was easy. It wasn't based on politics at all. It was the only machine around that even remotely could do the job. Just like our decision for GE hardware. We looked at all these machines. Some of them couldn't even do the job as we described the job. GE's was by far the cheapest, so that was an easy decision and it was going to be the easiest to work with, too. It had nothing to do with politics or the friendship that Myron Tribus had with GE people. I think a guy named C.C. Lasher was in charge of the GE operation at that time. As I say, the only thing GE gave us was an extra 10% on the educational discount from 50 to 60%. So I think we led the way on being one of the first computerized campuses. Other campuses who joined the Apple, who became Apple locations…

End Tape 4, Side A
Begin Tape 4, Side B

KURTZ: As I was saying, some of the other schools participated in this Apple thing and got lots of MacIntoshes on campus and so on, but it wasn't nearly as successful if they didn't have a backbone network. And we knew that, you see, with our experience with almost twenty years of timesharing. We knew that communication was the central ingredient, not computing. That goes for the administration who were involved in these decisions. They knew that, too, so it was very, very easy to say, "Okay."

I think they got a grant from the Pew Foundation to beef up the on-campus network and to bring the wires to every dorm room. Before that, the teletypes were in the dorms, but in some centrally located room, but not at every dorm. We couldn't put a

teletype in every dorm. So the leadership on our campus would include the deans, Provost Ag Pytte [Agnar Pytte] -- the provost at the time -- and so on. There was no selling job. It was obvious.

Many schools followed the Dartmouth model from the early days using what they called "mini computers". Smaller schools particularly. Larger schools, it would have cost too much, but smaller schools could. I think on a per-pupil basis, it probably did cost more, but a large university like Minnesota with 40,000 students, they couldn't even begin to think of making a budget commitment, but for a very small school like…let's see, where was it over in Maine? South -- I forget the name of the town -- Cape Elizabeth, Maine. They got themselves a DEC PDP-8. A high school teacher taught to make sure the students knew computing. A lot of the small schools were able to latch on to this idea that students should have open access to computing. The other part of it was the open access principle and that did not make large inroads in education until the advent of the personal computer. The one exception was I think at Harvard. They bought themselves a small time sharing system and gave courses. But even at MIT, people still had to sign applications to get computer time.

DAILY: Why didn't open access make inroads prior to the late '70s, early '80s?

KURTZ: Well, I mean, a sociologist could probably explain this more than I could. Let me contrast what Dartmouth was with what our sister institutions are. Dartmouth was and still is primarily an undergraduate educational operation. It does not have, with the exception of the medical school, it does not have a huge vested interest in supported research, government or otherwise. All of our sister institutions have a huge investment in supported research…Harvard, Princeton. They set up their computer operations with that in mind, that they were going to sell computing time to the supported research projects on campus and thereby support the computing venture, itself. That's what Harvard did. Their computer center was supposed to be self-supporting. They were supposed to bring in money. It's like football, the team at Alabama is supposed to make money. Right?

DAILY: Right.

KURTZ: So that is the way it was set up. So the idea that students would have free computer time…open access means free computer time…was anathema. It didn't make any sense. You know, it is like talking to George W. Bush and telling him the tax cut doesn't make any sense. He won't even listen to you. It doesn't make any sense, you know. Princeton tried a gimmick early on and it was turned down by the Bureau of Budget. They tried to get their computing costs included in their overhead rate. All our institutions…Dartmouth and everybody…has what they call an external overhead rate. So if you get a grant from the federal government, then that supports direct expenses, faculty…that type of thing. Then there is the institutional overhead rate that is tacked on…63% or whatever…which is use of the buildings, heat, light, power, library and so on. Princeton tried to get the Bureau of the Budget for the federal government to agree that computing was part of the overhead. It would have been a great step forward. The library is part of the overhead. Why not computing? They wouldn't agree to it.

DAILY: Oh, really?

KURTZ: So the other schools had to do little fits and starts and so on. They were saddled with these huge great big machines and they were overwhelming and you had to either do punch cards or you had to get special permission or whatnot. I know what Princeton did once because I was on their advisory committee.

We tried to get them to do timesharing. We'd say, "You ought to do time sharing." Well, ha, ha. And they did try to do time sharing by the way. They got themselves an IBM model that allowed timesharing, but they never got more than twenty users on it at a time before they gave up. What they did down at Princeton is to institute what many schools did or many universities did…this fast-batch processing. So the student jobs would come in on the cards. Okay. They would batch them up and they would be small jobs…no more than one minute or what…then they would plunk them through the computer. Boom. In a fifteen-minute period and then the answers would come back out on the high-speed printer. Well, this was better than waiting one day. You only had to wait an hour to get your stuff back. That was the best they could do.

DAILY: Another kind of culture change between Dartmouth and other places struck me when I was reading your paper was both you and John Kemeny's belief that computer language should be simple and user friendly. Even at the beginning, were there people -- say down at MIT -- critical of that viewpoint or, you know, kind of basically wanting to make it complicated to keep it in the professional realm?

KURTZ: No. I wouldn't say that. It is just that it's…you see, neither John nor I were computer scientists. We were mathematicians. We were techies Fine. We were sometime users of computers. We weren't computer scientists. Now most of the things that are done in computing these days are done by computing professionals and computing professionals have no problem with complex operating systems. You know, just document the stuff. Fine. So there was really almost no motivation in the world at large for making things simple.

Three or four years ago, Bill Gates down at Microsoft tried to move in this direction or made a move in this direction. They put together some of their stuff. You know, they have this office…they put together some of that stuff and I don't know how they did it and they called it 'Bob'. You see this is supposed to be user-friendly. But it never got anywhere because the idea was wrong. I never used Bob, so I am guessing that the idea was wrong.

If you look at the operating systems today, the Windows systems for instance, and you want to do something, you can't figure out what to do to do it. Oh, you press the control key. It is down here. Here is the documentation. I mean it is just not there. I had a lot of trouble with Windows. I won't say the Mac is that much better. I am comfortable with the Mac because I have used it all my life, since 1985. You know, go back to the old DOS system, the old IBM…the original clunky PCs…there was a certain simplicity about them. They couldn't do very much anyhow, but the stuff that is out there now, I mean, is just not simple and, yes, you can use…I assume you can use Word without…you just double click on it and then you type and there it is. But it is a huge, huge application. It is designed so that it can be used for publication; you know, footnotes, automatic table of contents, automatic indexing and so on. It's overkill. 99% of the people don't need that stuff. It is like saying you know, "We will have a car for everybody. It is going to be a

Cadillac limousine because it is cheaper to make." Well, you don't need that big car. That's all right. It still goes. Right?

DAILY: Right.

KURTZ: And of course the customers pay for this. They ultimately pay for it. So I don't think the simplicity idea has caught on at all.

DAILY: Okay. If it had…let's kind of play futurism a little bit…if it had, what directions do you think computing…what would computing look like now?

KURTZ: That's a good question because I don't think it would have taken off. I think the thing that is the obvious descendent of the communications thing is the worldwide web. Now I am hot and cold on the worldwide web because, as a new method of communications, it is absolutely fabulous. If our government or any government puts a crimp on what you can do on the worldwide web, it would be an utter disaster. It's like…what I am trying to say…what do you do…removing the First Amendment of the Constitution. I mean, in terms of free speech, I know there is a lot of crap that comes across the world-wide web, but I can deal with that. That's not a problem. You have got spam filters and so on and you can throw out….But what it has done…and this is from personal experience…the worldwide web, which is an outgrowth of email, by the way…what was his name? The guy that gets the credit for inventing the worldwide web?

DAILY: I always associate it with that Lucerne [Switzerland] lab·.

KURTZ: Yeah. That's right. I forget his name. Ber…yeah. But at any rate, he just figured out email, but let's generalize it and let's allow you to send pictures or something like that on it in the browsers. I don't know what specifically he did of his own creativity.

Another thing, the worldwide web has these search engines which are absolutely fabulous. You know, you go into Google or Yahoo or any of those and you say, "I want to find out about XYZ." Here's 479 hits. I mean that is unbelievable. That's unbelievable stuff. I wanted to buy my wife a present one Christmas of some china to match her set. Well, she bought her

---

· Tim Berners-Lee

set 25, 30 years ago or so when she was building her hope chest. They don't make it anymore. Okay. So I go on and use one of my search engines. "I'm going to try this." So I went out…the company…okay, it is in Japan and they give me their home page and it has got a lot of …it doesn't tell anything. It just has this blurb about what a great company they are. But I also had some hits and one of them caught my eye. It's a hit of an outfit that does buying and selling of obsolete china patterns…or at least this particular china pattern. What it was was a one-person operation, operating out of their garage somewhere in California. Well, I didn't order it on the Internet, but there was an 800 number and I called the lady and, bingo, we made a deal. That never would have happened without the Internet and a search engine. How do you find out about this stuff?

So that is a very positive thing and I think that there are other things like that. Maybe once every two or three months, I come across something that is really an eye-opener. So that's the good news. The bad news is that a lot of web sites are very poorly designed, very hard to use or they are designed to be used only on the very fastest of machines. If you've got a slower machine, they are very, very sluggish and slow. We don't have into our house…we don't have a DSL hookup. We have a modem and it's 28K or whatever it is. Oh, it is unbelievable. You might as well go out not only go out and get a cup of coffee, you can have a big meal while the thing is downloading. So that's the down side.

There is a lot of junk out there in terms of poorly-designed web sites. I don't mean things like pornographic web sites. I mean that should be reasonable. They just are not well thought out. So, you know, it's just like anything in life that is so universal. There is good and there is bad. There are good newspapers. There are bad newspapers. Whatever.

We had no influence on the development of the web. We did, at one point, have an ARPANET project. So I knew what was going on in the development of the original ARPANET. They were doing a lot of research and so on and when they finally got it running, what they used it for most, I think, was for email. [Laughter] Communication. Well I suppose you can send programs back and forth. You can trade documents that you

want to edit…share the editing on if. So the ARPANET was the predecessor of the Internet.

DAILY: So nobody was looking at the networks here at Dartmouth or down at Carnegie Mellon or anything like that.

KURTZ: No. The technology was well known. You just had to build it or buy it. When we did it, you had to build it. So people like Stan Dunten in Kiewit and other people took the New England Digital machine…I think I mentioned this…it was developed for the computerized music of Jon Appleton and made a communications front end for that. Well, communications front end for anybody. You can now buy them off the shelf a lot cheaper than you can make them. But we had to make them.

Another thing that we did was, before…this would have been in about 1980…before the Mac became widespread, Mac was…when did they come in? '83? '85?

DAILY: Yeah. Right about there.

KURTZ: You could have cathode ray displays. What you see is what you get kind of thing. But they were pretty expensive if you didn't buy a special setup. What people did at Dartmouth is to develop home-grown hardware again to be able to use an ordinary…I forget the model number…an ordinary CRT character display that was fairly inexpensive and build a 'what you see is what you get' type editor on it. I forget the name of that [Avatar], but that gave Dartmouth many a three to five year lead on everybody else in terms of providing that type of user interface. After three or four or five years or whatever the time was, that was no longer needed and you could use the MacIntosh directly as an access to other machines on campus like the library machine and so on.

DAILY: Do you recall the individuals who were involved with that?

KURTZ: Well, it was the Kiewit basement again and I don't. You would have to consult with some of the people down there. Jim Matthews [James W. Matthews] might have been involved. Stan Dunten might have been involved. The technical development…Looking at it from one point of view, it was a brilliant development. Looking at it from another point of view, it was just, you know, an obvious thing.

The way they did it was… Because the telephone lines -- which we were still using at that time…telephone, voice-created lines -- were slow enough that you couldn't do this in the central machine somewhere. You know, you would type a letter and it would be awhile before the formatting changes implied by that would take place. So what they did was they put in this little hardware thing so it upgraded the screen in real time, but it sent back to the main machine only the changes that were necessary and so the next time you got something from the main machine, they reincorporated those changes. It is kind of an obvious solution to a problem if you wanted to distribute; computing where the communications lines are slow. Well, now communications lines are so fast, nobody worries about that; but some day in the future they might revert it.

But again, that's just one of the creativity-type things that Dartmouth did to keep it at the forefront. You know, we didn't get any credit for that. Nothing we invented wasn't a salable product or anything like that, but it did provide the campus with a 'what you see is what you get' type word processing. I wasn't involved in the computing operation at that point.

DAILY: Looking from computing in the late '50s to the present, are there things that you worked on with BASIC and time sharing that we are still seeing today, including?…This would be a good place to talk about True BASIC as well…things that build off of those foundations that we use in computing today…whether it is more technical or more everyday…

KURTZ: I wouldn't say that because, outside of a few relatively minor things that we did that were original, we didn't do much. The things that we did had been done before. Timesharing was invented at MIT…or built at MIT in 1959 on a DEC PDP-1 machine. I think I described that and we just took the idea. It is the kind of a thing that, if you know somebody else does it, then you know how to do it. Just knowing that it is doable, you know how to do it.

So you say, "Well, trademark, copyright…no reverse engineering". It doesn't matter. You can do it. So we did the time-sharing system that way. We knew it could be done and there is nothing…you know it's not like you have to put together a lot of resources. I mean you are not sending a man to the

moon. It doesn't need a big project and there is no secret code involved or anything like that. You just do it and, given enough time and if you are bright enough to do it, you can handle it. So we never did anything original. We did not invent email. We were one of the first outside of the ARPANET to make wide-spread use of the email…one of the first. I would not go so far as to say we were the first.

You know, when you log onto your machine, we were still using the old teletype…clunk, clunk, clunk…and you would log to your user number and it said, "You've got mail-type mail." Mail was a typed command. MAIL and then you would get your email messages. I even forget what form they were in. So AOL comes by about twenty years later, "You've got mail." They actually tried to patent that or something like that.

That's another bizarre thing that happened in the computing world. Companies -- big companies -- with a lot of fancy lawyers, tried to patent things that are common knowledge and they got away with it. They get away with it because so many patents are being submitted you know. Professional organizations…they can't have a complete staff down at the patent office. Well, that's common knowledge or that's been done before. So they got away with it.

I remember in the early days of our computing, some guy came down to me. I think he was a lawyer. He wanted to know if I could testify on behalf of a client who had invented what is a teaching machine…using a computer to present stuff to students and so forth. You know, obviously fraudulent garbage. Mechanical teaching machines have been around for a long time…you know, these things where you look at this and then you open this door here and stuff like that. Or you can use these books on the left side, right side page type. So question and answer type teaching machines have been around. I said, "Wait. You are nuts because Pat Suppes in whatever it was…'59 or something like that, used the teaching machines and he was a philosophy professor at Stanford, to explore teaching arithmetic to grade school students in the Palo Alto school system. I mean, it was done a long time ago.   You can't possibly get a patent for something that's common knowledge." So there is a lot of that stuff going around.

Let's see…what is there today? I don't know that there really is anything left to what we had done. True BASIC is still a direct descendent of Dartmouth BASIC of course. Easy to use…you can take one of those programs in that book over there and type it in and it will run. Of course, it has been modernized also so you don't have to use line numbers and stuff if you don't want to. It still is widely used as a teaching program in various places. I think it is the only thing you might use in the middle school. It is crazy to teach JAVA to the middle school students. That's nuts. It's just nuts.

DAILY: Why so?

KURTZ: It's too complicated. The reason BASIC was invented was to get rid of the complications whose purpose is not clear. Let me get the blackboard book here.

DAILY: Well, if you want to put it on the board, I will copy it down for the text of the transcript. [Laughter]

KURTZ: Well, there is a lot of aspects of FORTRAN for example and the punctuation rules. They were very easy to forget because there was supposed to be a comma here, but there's not supposed to be a comma there. Why? What we did in BASIC, we used very few if any punctuation rules. We were using English words and so that helps your mind remember because the human mind is tuned to remembering familiar word and we picked familiar words rather than exotic words. That's why we say "hello" rather than "log on." I still can't remember whether it is "log on" or "log in" when I go onto a UNIX system. Fortunately I don't have to remember because it is automatic. I do have to remember to log off. It is "control D," whereas in BASIC it is "bye" or "good bye." So it really is basic and True BASIC follows that same paradigm.

It has gotten more complicated with the advent of Windows systems. True BASIC on Windows is more complicated to use than True BASIC on DOS. There is no question about that. The same thing…new Macs versus the original Mac. Again, you can type in that thing. All the other BASICS in the world that have been around, they have all come and they've gone and there are only two or three left and they have been developed recently. Visual BASIC is only vaguely similar to Quick BASIC and then there is a new one out there called Real BASIC. It is

so different that I couldn't even figure it out by looking at it. They didn't retain any of the same key words for function names for instance. SQR for square root…I don't know if they have, but there were so many changes. Why do they keep on calling it BASIC? Well, I don't know how they get by calling it BASIC, but they could have called it anything else and made just as many sales. But we were the only one. That 1964 core program is still around.

DAILY: Going back to your statement that, if you are a software company and you write your software with simplicity, with no mistakes, you are going to run out of business. So how does True BASIC stay in business?

KURTZ: Sell books. I think publishers realized that early on that they could use software to help sell books; particularly if you are in the education market…you sell books…not so much to secondary schools and middle schools because they will buy a book and then use it for five years. Colleges or community colleges…every new crop of students buys a new batch of books. That's recurring revenue. We have gotten to the point in True BASIC that what we do is sell an annual CD for a price that is so low it's not…you know, people won't blanch at the thought and it is different from the previous year's CD and it's got the operating system. It's got the True BASIC on it and a whole bunch of libraries, a whole bunch of stuff…written material in PDF form. The Adobe PDF Reader…the Adobe Reader, which uses PDF format is now pretty much of a standard. It runs on all platforms except it doesn't run on UNIX for some reason. So we have adopted that and it is compact…very compact, so our documentation has already been converted to PDF form. So they get a lot of documentation. They get a lot of utilities…quite a bit of stuff for their forty bucks or whatever it is they pay and it is once a year. So that is a continuing revenue stream for us, but there is no upgrade on the language system except bug fixing. We have given them more libraries. We've got a bunch of libraries that we can provide in the future or we can get our users to write libraries and then they can be included in the future and then its books. Books sell.

DAILY: Were you involved with any other computing projects? You had mentioned the…

KURTZ: Reconstruction?

DAILY: The reconstruction of the time sharing system. I think that would be a good thing to kind of flush out on tape here actually. We got it off tape last week, but what you are trying to do with that reconstruction and where it's at right now.

End Tape 4, Side B
Begin Tape 5, Side A

KURTZ: We were talking about this reconstruction of…It's not the original, but an early version of the Dartmouth time sharing system. The original thought came up about a year and a half ago when the event of decommissioning what the computer center called D1, which is the name given to the backbone computer that ran BASIC and other languages for so many years before…of course, the MacIntosh took over the BASIC part and other applications were imported to other environments. So D1 was the big backbone machine and they decommissioned it.

A lot of people came up for that. I missed it, but I heard later that somebody came up with the idea of trying to go back and reconstruct the original Dartmouth time sharing system. Well, that turned out to be a difficult idea because… Well, besides the conceptual problem of at what point in time do you reconstruct it…because it was a moving target…but just obtaining…it is all based on listings. Whenever we would come up or make any changes in any of the software, we would produce these IBM sheets…big, wide listings on the computer and then they would go into a stack. Some of these got saved and some of them got thrown away. So the search was on to see if we could find any… Things don't have a historical interest unless they have been almost thrown away, then they become valuable to historians. [Laughter]

At any rate, this effort was led by John McGeachie and Steve Hobbs; both live down…John lives -- I don't know where -- Massachusetts or some place. Steve Hobbs lives in New Hampshire. He used to work for DEC and then Compaq and now he works for Intel. He was one of the…both of them were one of the original student programmers. At any rate, Steve made it a priority of his -- a grail -- to try to find these old listings and he tried to talk about the old tapes -- those old magnetic tapes because all of the stuff was stored on the magnetic ...

Yeah. Some of these old tapes are…but then, if they still exist, they wouldn't work. They would have melted. So that's out of the question. Anybody have anything? I didn't have anything at home.

So he started emailing people who had been involved. We got an email list of thirty or forty names now. He finally found a fellow in Texas. I forget his name. I think his name is George Frane…but I am not sure…who worked on the GE side. He had some listings that he was about ready to throw away. Well the upshot of it was he sent those to Steve Hobbs and Steve Hobbs laboriously scanned them page by page in PDF form and TIFF and GIF form. I mean three different formats and put the results…the whole schmear onto a CD, which is now widely distributed.   I assume that the listings will eventually find their way here to the Archives. Fortunately they are on CD and everybody has a copy of the CD, so that's fine.

So he first tried to use a character scanning. If you have a scanner, there are softwares available that allow you to do character scanning, so you get a machine-readable format of what was on it. You can copy a book that way. The listings were so faint that that proved to be impractical and also, you can't tell a zero from a one and this kind of thing. You would have to proofread the thing character by character. So it was finally decided that we would transcribe these from the listings and that is in the process right now. I have been working as much as anybody on that.

When we get the software transcribed, you have the operating system for the central computer, which is the GE 225, 235 computer. Then we have the operating system for the Datanet 30, which is the communications front end. Then we have got the BASIC and we also have an ALGOL compiler. That was always part of their whole…it was never a BASIC-only system.

When all of this stuff gets put together, then comes the job of writing an emulator for the two pieces of hardware. Well, this is not hard to do either, it turns out. Modern computers are so fast that, even with emulation, we are running at least as fast, if not faster, than they did in 1964. So that is in the works. It is just a question of people getting the time to put in on the project and then, you know, get some kind of a workstation and figure out some kind of visual display that has an authenticity to it. I don't

know how interesting the result will be because I don't think any school kids will be interested in running simple programs like that. It had ten characters that…but it will be a good historical artifact. We have been in contact with Karen Matthews of the History of Computing Museum in San Jose, which is an offshoot of the Computer Museum in Boston.

DAILY: Okay.

KURTZ: That's kind of a fun project. It gets the people together and it might make some sense to do some oral history of that group.

DAILY: Yeah. I was thinking about that.

KURTZ: It was in…I can't remember the year. Wait a minute. Yes, I do remember the year. It was 1974. I think it was the…one of the joint computer conferences…before they had so many different conferences like they do now, they used to have one collective conference…The American Federation of Information Processing Societies put on a conference. It was in Chicago. One of the sessions was the first session for computer pioneers. A bunch of the people from Dartmouth were there…just reminiscing about their work, you know. I suppose this was video taped. John Kemeny was there. I was there. Ten or fifteen students were there and one person from GE was there…one person who had been at GE at the time. So we discussed things and then we got questions from the floor and so forth. So it was kind of a reminiscing session. That's been followed ever since. I think the next year they did one on the Eniac and they followed up on that. I think they have been every year or something like that. So there is that. That is kind of reminiscences and I am not sure how much historical value it has, but it would be good anyhow to get these guys together and turn on the recorder and see what happens.

DAILY: Right. Right. I have been thinking about that as I said. As I mentioned, David Lagomarsino had kind of thought about this a year or two ago. Is there anything else you would like to talk about?

KURTZ: Well, I don't really know. I mean just to say something that I said early on…that all the work was done by undergraduate students and they did some quite creative stuff. That happened because Dartmouth had very good math students and that

happened because Kemeny, following Sputnik …I think that was what? '5_?

DAILY: '56 or so?

KURTZ: '56 or '58.

DAILY: Maybe '58.

KURTZ: Well, it was about the time I came here and I think following that there was a, you know, beef up in research to universities and so forth. Research grants from the federal government to universities. So Kemeny developed an honors program in mathematics and then went around and recruited…like a football coach recruited…top-drawer students to come to Dartmouth. There was a time there where we had unbelievably talented mathematics students, you know, and nothing like it since. Many of the students who worked on the project were recruited…you know, talented math students. They really were quite good.

DAILY: Well, thank you for your time and for this interview. If you have things that come to mind, just let me know and we can get back together.

End of Interview