

Oral History Interview with Bonnie Carroll

Location: Oak Ridge, Tennessee

Interviewed by: Kendra Albright

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Transcript verified by: Whitney Tackett

Interviewee (BC): Bonnie Carroll

Interviewer (KA): Kendra Albright

Interview is in two video segments.

KA: We're here with Bonnie Carroll, and we're going to do an interview for the American Society for Information Science and Technology's seventy-fifth anniversary, and we're interviewing prominent figures in the field of library and information science. So, we're lucky to have Bonnie's time today, Bonnie Cooper Carroll, and I have a series of questions I would like to just get you started with, and I would like to encourage you to just carry on with these questions and tell us all that you can.

BC: Okay, well we've known each other a long time, so I'm sure you'll ask them. [laugh] And you know whether I'll answer them.

KA: That's right. Alright, so the purpose of this interview is to give you a chance to talk about your career, and we'd like to have that documented for the ASIS&T archives. Also to talk about your role in ASIS&T, since you were the president of ASIS&T in the 1980's, and to talk about your company. And you have some new news I'm hoping you'll share with us, when we get there. So the first thing is, I was remembering back a story, that I probably shouldn't tell, but I will tell this story. I think it was your fortieth birthday, maybe it was forty-fifth.

BC: It was only three years ago.

KA: Because you had your nails painted, and we had a party at your house, and you had done your nails so that the numbers four and five were right together on that finger and so whenever anybody asked you how old you were, you could show them. It was just a great story.

BC: It's a very funny story because yesterday, I was with somebody who had gorgeous nails and I told them that forty-fifth story.

KA: Yeah, that was a great story. I've been thinking of emulating that. When I turn forty-five. But I remember you were born in October, I can't remember exactly what year, but you know for ASIS&T that we are giving birthdays, so you can just give October and the day.

BC: It's October 4th, 1947, and I'm proud of every year.

KA: Good for you. Well you don't look a day over forty-five. And I mean that absolutely sincerely. ...no, I'm serious...well don't get me started. So, the question is, tell me about... when you grew up in New York City, is that right? Where did you grow up?

BC: Outside New York City. Long Island.

KA: In Long Island? I didn't know you grew up in Long Island, where in Long Island?

BC: South Central Nassau County, Bellmore.

KA: Okay. Can you tell me about your parents and your siblings? What was your family?

BC: It's interesting. I mean, I assume the focus of this is kind of professionally, ultimately, in how you started and where you ended up.

KA: Where'd you start from?

BC: So, it's interesting, because everybody talks about entrepreneurship, and I guess I've become an entrepreneur. But the fact is, I grew up in a very middle, middle class home. My father was an engineer, my mother was a school teacher, and I never knew anything about

politics, I never knew anything about entrepreneurship. It was a very sheltered environment. I don't know where this all came from, but that was the environment I grew up in. I have an older brother who is very close in age, people thought we were twins, he's a year and ten months, but girls look older and boys... So for years it was Carrot Top, I was a red head and so was he, and Bonnie, and then about seven years later my younger sister came, and that changed the family life and dynamics. But I was off to college by the time she was ten years old.

KA: And you and Roy Cooper have been married now for how long?

BC: Thirty-one years.

KA: So, that would be 1980. I can't believe that. That's a long time. I can't even count that far back. So but in between the time you grew up in Long Island, what did you do? After you graduated from high school you went to Cornell, and what did you study?

BC: Right. Social Psychology. And that was a very traditional thing to do, you know. You grew up in New York City area and then you wanted to go up to Cornell, the great school on the hill, and you went there, and then I got my degree there. Actually I got my degree in three and a half years, and a girlfriend and I, who have remained friends since we were both fourteen years old, our careers and our lives followed each other, we went and we both graduated early, and then we took off and went travelling for three months together, and then I went on for another three months. And then, when I left I said, 'Well, I'm applying to library school,' and I'm sure we'll get to why, 'and if I get in when I get back, I'll have something to do, and if not, I'll come back and find a job.' And, that's what I did, and I got into library school with a full fellowship, Title 2B fellowship, and when I came back I went to Columbia, Columbia University, and did my graduate program there.

KA: So when you went travelling, what all did you do...

BC: Barbara and I went all over southern Europe, we went down to Africa, so that added a continent to my life list, and then all through to Italy, and then she had to go back for her

brother's wedding, and I went on to Israel, and so she went back through France, and I spent two months in Israel and then went to Scandinavia for a month, and then came back to the States and started graduate school in the fall. We left in March of 1969.

KA: That's quite a trip to take. So six months of travel...

BC: That's right. With three hundred dollars in my pocket.

KA: And how much did you come back with?

BC: [laugh] I was fine with three hundred dollars for six months.

KA: Couldn't do it now. Well that's great.

BC: We were quite adventurous and we hitch-hiked and did all kinds of interesting things.

KA: So you traveled around then you came back and you went to Columbia. And what in the world possessed you to decide to apply to library school?

BC: Well it was interesting, my mother was a school teacher and also a devotee of libraries. She loved the library, she loved the librarian. And I guess somehow in my background that stuck. But in fact, when I graduated from college, I figured I was going to go to law school. And I figured, well, I didn't have the money to go to law school, so I would go and see if I could get a scholarship to library school, a fellowship, and then, once I got back, I could earn a living while I was going to law school. And that was actually what I was thinking about doing. Well, I did get my library degree, and law school was not in the picture.

KA: So, what happened then after you got your library degree?

BC: I got married. That changes lives. So, from Columbia my... the man I married was a graduate student at Cornell, and so we got married and then I went up to Cornell and I actually worked at the undergraduate library at Cornell, and that was my first job.

KA: I noticed that you were the assistant reference librarian...

BC: In the undergraduate library at Cornell. And I'll never forget the day where, you know, we were in the undergraduate library, and I was the reference librarian on in the evening, and there was kind of a big hallway with steps and the kids used to congregate... kids, you know, they were two years younger than I was. I once came out and said, 'would you be quiet,' and one of them looked at me and said, 'you must hate us kids.' I'll never forget that. I had graduated... It was shh, you're in the library... Well that was probably the last time that ever happened.

KA: So then, you were, after the reference librarian, what happened after that?

BC: Well, I helped type a hundred-page PhD thesis, with a manual typewriter and a little white out, and then, actually, my husband at the time, he was a PhD chemist, and he was looking for a job. And it actually, it was 1971, it was very bad times for scientists, and it took him a number of months, and he finally got a job at Oak Ridge National Laboratory. So, I followed him down here. Here being Oak Ridge, Tennessee.

KA: And so you left the academic reference department and you came to Oak Ridge, and what did you do?

BC: Jobless.

KA: Jobless. What did you do when you got here? I bet that was quite a culture shock.

BC: Oh yeah. It was a culture shock the day we drove into Tennessee. We slept in the tri-cities area where Virginia and Tennessee meet, and we woke up in the morning and there was snow on the ground. Now coming from Ithaca New York, snow on the ground was no big deal. But

being in Tennessee, snow on the ground, I said, 'where did you bring me? Where are we coming?' But we got to Oak Ridge and we stayed with some people that my husband and I had met, and they were wonderful, warm people, very cultured people, it was a very cultured town, it was an oasis at the time, in the middle of nowhere but there were PhDs from all over the country and all over the world. And so we made our way, and we rented a house, and for a couple of weeks I was just looking for a job, and then it got to the point where I turned on the soapbox. And after about three days of that, I told my husband, I said 'you've got to help me find a job. I cannot do this.' And sure enough, the Oak Ridge National Laboratory Librarian at the time was at the International Atomic Energy Agency in Vienna on an assignment for two years. So they actually had a slot open. Not for the director of the library of course, but they had a position open for two years. And, so, I took the job. I was a reference librarian at Oak Ridge National Laboratory science library.

KA: Now, that was 1971?

BC: It was '71.

KA: And so in 1971 the Oak Ridge National Laboratory... was it more independent, you know, later on it had multiple libraries across the three Department of Energy facilities here.

BC: Right.

KA: At that time was it just the one...

BC: No no. There was a central research library where I worked, but there was a biology library, there was a library at Y-12 National Security Complex, called Y-12 Weapons [?] at the time, and I think there were one or two other branches at the time. Yeah.

KA: So you went to Central Research Library, known as CRL.

BC: That's right. You did a time there too.

KA: I did my time there.

BC: That's right. We both know Bob Conrad.

KA: [?] That's right. So, you worked at Central Research Library, as an information specialist...

BC: A librarian...

KA: Now, at that point, you had had some experience between reference in an academic setting, and now reference at a special library. Any particular notices of differences in the jobs that you had?

BC: Quite different, but I think a more interesting story is what actually happened. When I was in library school, I had a course in services in the physical sciences. [Jessica Milstead?]. It was her first year as a faculty member, and she was as scared as we were, and I was in her first class, and she was teaching us about the different policy documents that were coming out in science information. And she told us about the Weinberg Report. And I had read the Weinberg Report and it made quite an impression on me. Because it talked about librarianship not just being an archival place, but in really having to have information analysis centers, where there really is work that's done where you help people find the knowledge. It's not about physical items, it's about knowledge of content. And that report really stuck with me quite a bit. As well as other policy documents, which is where I think I got my first policy interest in scientific and technical information policy. So I had read the Weinberg Report, and Alvin Weinberg, who was director of Oak Ridge National Laboratory at the time, was a brilliant and wonderful man. And, he used to have bi-monthly colloquia, and of course I was this full-of-energy young librarian, so I would go and voraciously absorb everything he was ever saying. And then I worked in this very traditional library. So one day, and he was a great library user. I mean, he was really wonderful. He asked a question about the Watt steam engine. And he was saying, 'how long did it take before the steam engine was replaced by new technology?' Well, that's a tough reference question. And, I stayed late and I was trying to figure out if I could get anything that really could

help him, and I finally, it was late that night, and I called his assistant, who was the gatekeeper to Dr. Weinberg's office, Elizabeth Richardson, and I said, 'I have a little information, I'm not sure I answered it.' And she said, 'Why don't you come up here and tell him.' And I said, 'okay.' And so, I went up, and I went into this hallowed ground, Dr. Weinberg's office, and he's a nice man, but his reputation was just absolutely incredible in this industry. And so I told him what I found, and he said, 'well, you're new here,' and he started talking to me, and he said, 'well, what do you think?' And I went and I said, 'I go to your colloquiums, and you talk about things, and I read the Weinberg Report, why doesn't it start at home, what you're advocating? Here you have libraries, you have information centers, and there really isn't any real integration and, you know, [?] here to do some of the things you preach.' And at the time, [Francois Cortez?] was basically his staff assistant, Randall (man, these are some wonderful old names), who staffed that report, and so, so then that was the conversation, and then I came across and met someone who was in the Program Planning and Analysis group, which was this strategic planning group for Dr. Weinberg for Oak Ridge National Laboratory. And, I was talking to him, and so he asked... he says, 'well I heard you talk to Weinberg,' so I told him the story, and he said, 'well why don't you come up and talk to us?' And, basically, as a result of those kinds of conversations, they took me out of the library and sent me up to the environmental information systems office, which was a new program, research applied to national needs, where they created an environmental sciences division at Oak Ridge National Laboratory. And, they had that information system. And, so, I had spent a little time there, and met some people that now are having a big impact on the company, including Larry Peck, who worked there at the time, went on to build a \$1.6 billion business for SAIC, and Larry is currently on our Board of Advisors here, so kind of it all has come full circle. And, I spent a year and a half there, and then [Cal Burwell?], the man that I spoke to at the time, called me and asked me to come down and join the Program Planning and Analysis group. And so, I joined that group. I had left the library, had gone into the very earliest of information systems. My orientation was always advanced information technology, applied to libraries and information. And I ended up in this Program Planning and Analysis group. And there, you know, you do all kinds of interesting studies; we did a study of the social sciences at Oak Ridge National Laboratory, because they weren't allowed to have social scientists at the time, it was all physical sciences, we did a study of food shortages, we did some really interesting kinds of things, and it really broadened my horizon in science policy. They were

encouraging of me to get involved, ARPANET was coming in, so they asked me to look into ARPANET, and how could they use it, at Oak Ridge National Laboratory. And then, in 1976, they actually sent me to Washington D.C. for three months, on an assignment, to help [?] which was a predecessor of the Department of Energy, create a strategic planning process for their national laboratories. So, this was all this wonderful, wonderful exposure, and you know, as a young person I had no decision authority, but I had a lot of interesting connections and input into very important processes.

KA: And access to a lot of important people.

BC: Yeah, and I remember one thing that greatly impressed them, which was so, just a simple library problem. They were looking at black lung disease, because of course the nuclear industry was under a lot of siege, and they were saying, 'well, let's look at the coal industry.' And, I went and I found an article that talked about the economic impact of black lung disease. In the... as a result of the liquefaction process in Germany during World War II. And everybody was so excited, that somebody found this great, interesting information, and it was a reference question, that's what it was. So, that kind of launched a different process in my career; I've never worked in a library since. Except, I did spend three days in a library that my company transitioned from a government to a contracted one, where I actually spent two days doing a book inventory. [Laugh] On April Fool's Day, in Montana, and it snowed. And [Pat Powell?], who, we're having her retirement party tomorrow night, actually was the one that was running that contract, and she sent me there. And it was... so that was the last time I actually worked in a library. But after that, I went really went, rather than in librarianship, although [we run libraries?] and the knowledge I have as being a library and information professional, has really extended into everything I do, that whole knowledge base. But I didn't work in libraries anymore. I went from Oak Ridge National Laboratory Program Planning and Analysis group and then went out in the private sector in a company kind of like mine, and then I had the opportunity at Oak Ridge to work for the Department of Energy itself, at the Office of Scientific and Technical Information. Which was exactly what I had been preparing for, because it brought together a whole knowledge base, you know, how do you collect all the knowledge out there, research and development program, the multi-million dollar program of the Department of Energy. I spent

seven years there. And then, I went out into the private sector and then eventually, well, not eventually, a year and a half later, that particular company didn't do so well, and so, I was looking for what to do next, and I started Information International. It wasn't long after that that you came and joined us.

KA: That's right, that's right. First as a consultant, and I think that was in 1990 or '91, and then in '92...

BC: We won.

KA: We won the contract to input [markets for?] the Department of Energy science and technology database.

BC: Creating the database. We were the largest input source, not only to the Department of Energy's database, but also to the International Nuclear Information System, which was US input to that system. You managed that for us. And that... I was reflecting, since Pat's retirement is tomorrow night, on the kind of fun things that happened, and that's one of the things listed in there, is the party we had when we found out we won.

KA: I remember we had a choice between...

BC: Dessert, at the Lakeside Grill. [laugh]

KA: We had a choice... You said, 'okay, I've looked at office space, now that we've won the contract, I've looked at office space. Here's the question for you, the management team. Would you rather have excellent office space with very nice offices, or better salaries?'

BC: Did I ask you that?

KA: You did.

BC: Well, that was a dumb question.

KA: It was unanimous. We all [yearned?] for the good salaries and forget the office space.
[laugh] I mean, it was an okay office.

BC: I learned something. I'd never ask that question today.

KA: Well, but you have great, great digs now.

BC: And good salaries.

KA: And good salaries. Yeah, you have it all. I wanted to come back to something that you said about how the breadth of knowledge, while you don't work in a library, it applies to a lot of library and information science, and this knowledge base you have is a breadth building on the library and information science that you came in with, as you grew into this science of information policy. I want to come back to that towards the end, and I just want to mark that and come back to it.

BC: Well, you'll have to remember that because I may not.

KA: I will. I have it written down; I won't forget. The... You were at the lab for a total of...

BC: Seven years.

KA: Seven years. So, when you were there, and they had invested in this, when you left, did you maintain contact with those people as you moved through the next few phases of your career?

BC: With Oak Ridge National Laboratory?

KA: And the people that you worked with, Alvin Weinberg, for example...

BC: Well, of course I knew Alvin, you know, I didn't do business with him, but, you know, until the day he died, I had... well, I had interactions with him because a couple years after that, we wanted to revisit the Weinberg Report, and so we asked him to write his feelings about the Weinberg Report revisited, and I remember he really was not aware of all the changes that had happened in the online industry. And, so he reflected on that and he actually wrote a paper as a result of our conversation with him on that. And you know, the people that I knew moved up into high positions at Oak Ridge National Laboratory, and some of them today, even as I'm now doing business, some of it with Oak Ridge National Laboratory, some of that has helped me to know what's going on, to know people, and things like that. So, there have been connections. A lot of the most senior management of course now are in their late eighties.

KA: Right, right. Well, Alvin Weinberg died, 3 or 4 years ago, not too long ago, but I know that he made a quite an impression on the field, of science in general much less the life of Oak Ridge. [...?] I only met him a few times, but he was always a very gracious man. [...?] You guys were friends. I was reading through your resume, and I learned something new about you that I hadn't known. You actually did some coursework towards an MBA at the University of Tennessee. What was it that precipitated that? What would make you do that?

BC: I guess I had an MLS and it was time to go learn something else, and they had an executive program in Oak Ridge, an extension in Oak Ridge, so I started taking courses. And actually, it was very interesting because, in one of my classes, you know, everything is connected to everything in some way in this universe, but one of my classes, I can't remember which class, it could have been economics, there was this guy, and he kept asking questions. And so I asked somebody, I said, 'who is that guy?' And they said, 'oh, that's Herman Postma, he's division director of the fusion energy division.'

KA: Which was Alvin Weinberg's successor, is that right?

BC: Herman Postma became the director of Oak Ridge National Laboratory, while I was in the Planning Group. So we actually had that connection back from when I did my MBA. But, at the

time, and you know this, but it wasn't written particularly in my professional resume, but I was also an actress when I first came to Oak Ridge.

KA: Yes, I did know that. That's right.

BC: And so, at the time, I was working full time, I was in plays, and I was doing my courses toward my MBA, and it just got to be more than I could do, so I did never actually pursue the degree in the end, I just got involved with [?]

KA: Threw your MBA over for the acting... [laugh]

BC: Yeah, well, not exactly. I also taught at the library school, twice.

KA: Yeah, I know you did. What did you teach?

BC: Sources and services in the physical sciences.

KA: Both the first and the second time?

BC: No, the second time I think I taught science... something more related to science policy. But it was, again, in science information.

KA: That's great. And, while you were at OSTI... So, you were at Oak Ridge National Laboratory and then you had a brief stint at the Franklin Research Center, is that right?

BC: Franklin Research Institute.

KA: Okay, and what was that?

BC: Well, they were a government contractor that did contracts for the government, very much like my company does today.

KA: And then you went to OSTI, and while you were at OSTI you were involved in some international work.

BC: A lot of international. I was the assistant manager for program planning and international activities for a while, and we did a lot of work with the International Atomic Energy Agency, because the International Nuclear Information System, the US and OSTI was the US national representative to us, and of course, we produced, helped produce, the US portion that went into that international database. The things that you and I had done, and a bridge that other people were doing.

KA: And also during that time was when you served as the ASIS&T president.

BC: Right.

KA: Which was a lot to do at one time. So you had some international stuff going on with your work with OSTI, but you were also travelling during the time that you were ASIS&T because I remember the day you came to Tennessee and talked at the University with the students, and you were getting ready to go to, I want to say Thailand, or (somewhere in) Southeast Asia is where I remember.

BC: I'm trying to think of what...

KA: This was...

BC: Oh, but it was 1985 when I was president. At that time, the Taiwanese invited the ASIS&T president to come and give lectures there. And so, we went and we spent a week in Taiwan, giving lectures, and then my husband, my current husband, and I (we missed that little portion of what happened, nothing bad, just different ways), we went, and then we took another week or ten days and went to Thailand and Burma. So, that's where I was going at the time.

KA: Yeah, because I remember that, that you were getting ready, like maybe that afternoon or the next day, getting ready to go.

BC: Could've been.

KA: So, during... in reflecting back on the year that you were the ASIS&T president that year, what stands out as important or of note to you about that year?

BC: Well, one of the very interesting things in that time, the concept of email was just beginning. And at the time, there was something... I'm trying to remember, the New Jersey Institute of Technology had something called the Planet system, and they allowed ASIS&T to use that. And it was an email system. And there was another one, I don't know whether it was through ARPA, I'm not remembering... There was another system that was only used mainly by universities, but I actually used the Planet system to communicate with the executive committee of ASIS&T. And it was the first time I, and most people, had ever really used email, and that's when I got my first exposure of you send once to many, and that kind of thing. Well, it was an experiment. And there was no particular continuity after the year that we did it, but it really left a... quite an impression on me having tried to do that. There was also a lot of change going on in terms of the executive director, you know, ASIS&T's history, about that time, but... Well, certainly I hope I did a good job and had an impact on ASIS&T. I remember believing very definitely that the president of ASIS&T should have a kind of a platform and some goals and things like that. It was a time of change, the 1980's, and so we looked at the challenges, and I wrote an article in The Bulletin, about the challenges, and I should've gone back and reviewed that before we had this interview, had I not been crazy the last month, I would've done that, because that really would reflect all the things we were thinking about at the time. But I was very serious at the time, I was a young, energetic woman...

KA: You were quite young...

BC: I was. I was very young, yeah. And, so, I had great ideas, and great aspirations for doing some things that I summarized. I don't remember what they were, but I remember I summarized them very well.

KA: Well, I remember a lot when you spoke at the student group, I remember you talking about some of the international aspects of information, and things that you were interested in and getting ready to do, and you talked about some of the fundamental concepts with your talk with the students and how they were important in so many other areas of life that perhaps students hadn't really thought about. That's what I took from it.

BC: Glad you remembered a lot of those things.

KA: You made quite an impression on me, it changed the... I mean, if I hadn't been going in the direction I was going, [?] it was really an interesting talk. I still remember it for many reasons.
[laugh]

BC: The [Coke?] story.

KA: So, when you were at Oak Ridge, at the lab, you did not have email, but after your presidency, and the Planet system, and you got to OSTI, it was probably right around in there, well, you were already at OSTI, but around the time presidency, would be about the time that OSTI was having email[?]

BC: '86?

KA: Yeah, that's what I'm remembering. Because the lab got email in '86. Because I was there in '86, and that's when we started...

BC: I'm not remembering that that was such a significant impact. I mean, you know, it was in the course of technology change... But I do remember while I was at Oak Ridge National Laboratory, and I had a wonderful chart about all the changes in technology, it was only in the

1980's that the first personal computers were there. And Herman Postma made a pronouncement that they would only have one personal computer at Oak Ridge National Laboratory. And, so, you can see how times have changed.

KA: They really have. I remember getting my first 10-megabyte hard drive, thinking that it was huge.

BC: Enormous... the whole world could be there.

KA: So I could put the fisheries database [?] you could put the whole thing on the hard drive.

(Quite a few changes.?) What was it that made you decide to join ASIS&T and get involved?

BC: Well, I was always oriented towards professional activities. I don't know what drove me particularly to ASIS&T, I can't quite remember, but I do remember my first ASIS&T national annual conference was in Atlanta, and I was, it was in 1979, and I drove down to Atlanta with Jim [Cate?] who worked at OSTI at the time, and I didn't of course, and I just had a wonderful time, and I went to the SIG cabinet, and that's what really got me involved. I just was so frustrated at what I was hearing, and of course I had a better way to do it, and so I stood up and spoke about the better way I would do it, and of course at the time, the cabinet and the council, they were kind of a little bit sleepy, about that time, and before I knew it, I was elected the SIG Advocate Counselor and of course that was a national level position, and that's what kind of sucked me in to all things ASIS&T. And that was I guess '79, and then in '85, I ran for president. I don't remember step by step how that happened, but it did. Facts show it!

KA: [?]

BC: But we worked hard. We really worked hard on the SIG structure. I think we're still working hard on the SIG structure and how that operates within ASIS&T.

KA: That's right. And you, also went on to win the Watson Davis Award.

BC: For service to the society. I think I just... you just get on that mill and you just keep going. Just doing a lot of things. It was great times. And ASIS&T really was a big influence. I remember at the time and people you met and everything, and I'm just lost... his name, the director of Chem. Abstracts... Dale... he was the director of the chemical abstracts service. Dale, oh dear... it'll come back to me. Anyway, Chem. Abstracts was the big information system, it was the big vendor of science information. And he once said, the president of ASIS&T was worth ten million dollars. Because of the contacts and the things that happened as a result. And, it may be true.

KA: [?]It's still going.

BC: Dale Baker. Thank you. Dale Baker, right.

KA: You know, when I was at Sheffield, [?] (Peter Willis ?)who was the head of the department there, is well-known for his work in (chemo analysis) [?], which uses lots and lots of [?] (specific) data(...modeling)

BC: Structures and vocabularies, and... yeah.

KA: The work in ASIS&T now, it's always been an international organization, but of course they changed their name, one of the names on the list of possibilities, was the International Society of Information Science as opposed to the American Society of Information Science and Technology that debate is ongoing it's not an issue at this point but there is the establishment of the international relations committee...5 years, and one of their primary focus areas is to develop relationships and partnerships with sister organizations internationally, so they can share benefits of conferences and memberships across the different societies. Does that, you worked a lot with ICSTI internationally. What is your feeling about the internationalization of information?

BC: It's there. It exists. I mean, knowledge doesn't know boundaries, and, so, the more you can interact with like communities of practice I mean the communities of practice in all fields are international. And especially in information sciences. Science doesn't know geographic

boundaries. So, it's I mean, the more you can cooperate and leverage each others' capabilities, that's always the better way to go. I believe that, I always try to live that and I think it's true. I mean, but it's also interesting, with China rising, and with India rising, one starts to think about the balances on the kinds of things when they have, you know, their percentage of geniuses, and their percentage of PhDs, and the numbers are just absolutely overwhelming when you've got a billion people. And, so, you know, it causes you to worry a little bit, and think about re-thinking, but then you always come back to openness is really, in the end, the only way to go. So, I haven't changed my mind about that one yet.

I'm going to ask us to stop one minute, because we're closing a deal today, and they called me on my cell phone and my [own?] phone, so I'm thinking it may be important.

BC: But is that yours or is that ASIS&T's?

KA: It's this department's. Okay, is this thing on?

BC: Thank you.

KA: Alright. You were talking about ASIS&T and your involvement with ASIS&T, and I'd like to keep that line of thought going for just a few minutes, and this is on tape two for the... the tape will be on the DVD, and this is the second part of the DVD. And it's the second file on the School of Library and Information Sciences digital files, and the second tape on the audio files, so index marking. Okay. When you were president, and also, the year leading up to your presidency, into the past president, now you get three years to effect change. And in those three years, was there anything that struck you, as things you might like to have done, that you didn't feel you had time to do, or just didn't have the opportunity to do in those three years?

BC: Gosh. Well, the perennial challenge to ASIS&T was membership. And ASIS&T is a society that's an umbrella society; everyone has some specialties, but ASIS&T is kind of a place that you go for your kind of intellectual stimulation. Not necessarily like SLA, people get practical kinds of things, at least that's the way it was in the mid-eighties. So, there was always a

challenge of membership development. And I know we did studies of what members want, and the nature of membership Don King was very involved in those kinds of things. So, you know, you always have regrets that you didn't weren't able to raise the membership numbers higher than they were at the time. But ASIS&T was always a very exciting place where there were a lot of very interesting thinkers about what was going on.

KA: I think that the membership issue is still plaguing...

BC: Always, well now it's even worse because of limited funds, and the competition for mind-share and time-share of people's lives is just incredible today. You know, you're never off, you're on twenty-four seven and people just don't have the energies. I know the local chapters it's hard to get people to come to meetings, everywhere. So there're some real challenges in that. So that's always... it's not going to get much better.

KA: Yeah, yeah.

BC: The other thing I remember that... I think it's even well it's definitely a bigger challenge today. But the federal sector representation in ASIS&T, meaning federal employees that will involve these kinds of things when... in 1979 when I first went to ASIS&T, you know the greats of the information profession were all there at the annual meetings. And just being there, and meeting them. I always thought of ASIS&T and professional societies as an opportunity to jump hierarchies. I mean, you'd never talk to the deputy director of the national library of medicine if you were a kid. You know, because it was impossible. You know, you were too low a level; you never got up there. You go to an organization like ASIS&T and you're peers, in a sense. You can go talk to anyone, you start working on committees that they're the chairman of, and you can impress people in different ways that... you know, you just jump the hierarchies of institutional structures. And so for me, meeting all these federal people was really career-enriching. It really was, both by the association with them as well as just getting to know them and to be able to say, 'oh, yeah, I was talking to ?, I was talking to ?'s people.' And you were; it was a real thing. So, what disappointed me, and continued to, was the loss of participation of federal managers of information in ASIS&T. And at one point, a couple of years, we tried to do

something with that. Actually, now, with the scientific data activities, there's a very rich target, the federal government is doing incredibly good thinking and activities on scientific data management. And ASIS&T is doing some things like that, and that's a perfect opportunity to start re-engaging federal information managers and information professionals. So that was something I think was disappointing to me back then. And maybe continues to be an opportunity and a challenge.

KA: Where, in your opinion, do the federal managers today, information managers today, go to share their ideas together, if not ASIS&T? Where are they doing that?

BC: Well, I'm... we've been the executive secretariat for an inter-agency group, of fourteen federal science and technology agencies, where the heads of those organizations meet, and they share their ideas in those kinds of environments, and it'd be very hard to get them to ASIS&T meetings because there's not enough focused attention on things that would be relevant to them. Some of it is just too technical. ASIS&T is much too technical for the senior managerial levels. So I don't know whether you can make a track that would keep them involved for two days, you know, something like that. So, there are a lot of more targeted associations, a lot of them participate in ICSTI. Actually ICSTI is an organization that does attract the federal sector.

KA: And that's the International Council for Science...

BC: for Scientific and Technical Information.

KA: And that's the European counterpart to...

BC: No, it's international it is it started as the International Council for Science, ICSU, International Council for Scientific Unions, which became ICSU, International Council for Science. They had two groups that were interested in information. One was Co Data, Committee on Data, and the other one was ICSU Abstracting Board, so that dealt with the documents. The Abstracting Board became ICSTI, but the time that change was effected, ICSU was it's an association of academies of sciences. And they did not want to allow membership of

the commercial sector. So, ICSTI was very much founded on the relationship between publishers and the governments and things like that. So... commercial publishers were an integral part. So they kind of had to break off. They became kind of first cousins. And they still have that kind of first cousin relationship, whereas Co Data is more an integral part of ICSU.

But for international scientific and technical information, those are in my sphere of activity, those are the two major places where people gather and talk about common issues.

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KA: How did ASIS&T fit in for, did it have a role in the way that you feel like your career developed, that brought you, now that we've lead up to IIA, to the establishment of this company?

BC: Well, this company is based on the management of scientific and technical information. I don't know if you can see the backdrop, and navigators in a sea of data. So, the company was first formed in the experience that I had personally and professionally. And scientific and technical information, the fundamentals of librarianship, understanding the structure of knowledge, and how people need and use and communicate knowledge, and things like that, were very fundamental. And ASIS&T was very fundamental in my own development and understanding, and the contact base, and the exposures and things like that. So, I mean it was just an integral part. I mentioned the jumping of hierarchies. Just meeting these people. Just having the associations of people that you never would have had as a young professional, if you had stayed within your institutional structure. So, it was very influential, and that, and the places that I worked all added up to contacts, because, when you go into business, it's based on who wants to engage you to do work for them. Well, having the experience and knowledge of what their needs were, like in the case of the Department of Energy's Office of Scientific and Technical Information, they're our best client today, because we have a common understanding of where we're going, and we can well support them. So, does that kind of answer...

KA: Yes. And also, what I'd like to do is follow up a little bit more on the work that you do with CENDI. If you would, explain what CENDI is, and maybe talk a little bit about what kinds of activities you do for CENDI as the executive director.

BC: Okay, well CENDI is kind of a flagship contract. It's a small contract, it's very small. Not even like a percent of their business, but it's a very mighty contract. I mean, it really exposes you, and it helps you in thought leadership, which then you bring to the operating contracts that are the real bread and butter of the company. But it's this knowledge in thought leadership, of what's going on in your business. But I'll tell you a little bit more about you said you wanted to know something about IIA. Because we do more than just this part of the information business. So, we can talk about that maybe...

KA: Yes.

BC: A little later. So, where were we?

KA: I was just curious... I wanted you to start with CENDI.

BC: Okay, CENDI. Sorry. So, when I worked at the Department of Energy's Office of Scientific and Technical Information, there was, under [Andy Anes?] and for many years there was something called COSATI, which is the committee on scientific and technical information. The Weinberg Report had an influence on that. So within the federal government, there was this kind of organization on scientific and technical information, and the managers of the centralized systems and the major science and technology agencies, meaning defense, with the Defense Technical Information Center, NASA with the NASA STI program, and Energy with the Office of Scientific and Technical Information. And then NTIS in the Department of Commerce, which was cross-cutting public access to the results that each of these collection centers managed for their own missions. Those managers had a lot in common, because back then, everything wasn't virtual. You built your own silo with a database, because that was pretty advanced when you're building electronic databases. And then, materials science well, NASA did materials science, DOD did materials science, DOE did materials science, and other agencies NTIS was collecting miscellaneous other, NSF, of course NSF published journal literature more than technical reports. But these managers wanted to share information. So, materials science they would get from the Department of Defense, re-index it, so that it was exactly relevant to Department of Energy interests, but there was a lot of exchange of that kind. So there was a natural need for

these people to think together and communicate together. And so I worked at OSTI, its predecessor, its name was not OSTI at the time, and I watched the manager, Joe Coyne meet with his counterparts. And, I was the strategic planner for OSTI. And I said, 'well, could I invite, one time when you meet,' and they rotated around, 'when you meet down here, can I invite the strategic planner, so we can all talk about what we're thinking and what we're doing?' And we did that. And we had a great meeting. And of course, we were organized, active, and we came to give things to these principals, and it came to be that they said, 'well, why don't we meet together, and why don't you staff our activities?' Because we were quite organized with all of that. And that became a new organization, which was called CENDI, after Commerce, Energy, NASA, and Defense Information. And so we formalized this kind of informal meeting. And then I left the Department of Energy, so I left it, but it had been formalized in MOUs, and the National Library of Medicine was the fifth agency that joined, that was back in 1986. And then I left and then the chairmanship rotated, and you know, it was staffed by the planners, but in a fairly rotating way. And they decided they wanted to pay somebody to keep them organized. And so they tried to do that through one of the agencies offering up a person, and everybody contributed a little bit of money. That wasn't working perfectly well, and by that time I had started IIA, and looking for work, so I was talking to Joe Coyne and I said, 'Joe, you know, if you have money, you're going to pay somebody, why don't you pay me? I know how to do all this, you know, I was involved in it.' And that became the first steady contract, and the purpose of it was to create coordination. So it was a group of peers: the principals, who were the senior people, and alternates, who were essentially the planners at the time or whoever they wanted to appoint, but it was the planners, to get together to exchange ideas, to look strategically at where their missions were going, to see how they could leverage activities and things. So, that was, you know, a year later, so that would have been '89, something like that and we got our first contract to manage this whole process. Well, this many years later, however we still have that contract. I mean, it's been different contracts, competitively won, but of course we had so much knowledge, and so much vision from them of where they were going, that we continued to do that contract, and today CENDI is fourteen agencies. So, it's ninety-seven percent of the federal R and D budget. The agencies that participate in that really do represent the federal R and D funding. And we continue to have the same principles. How do you improve the science mission of the federal government through more effective use of information? So, we're still

doing that, and we do that by having, you know, bi-monthly meetings where we bring in good speakers that are of interest, looking out for what's coming out, from technology to policy, we hold workshops for education. We have three goals. One is the leadership, bringing together the leadership in scientific and technical information. We have projects, and I'll come back to that, and then we have education, where we educate both internally, our agency's staff, as well as the community. So we have lots of workshops that we put on. And, the middle thing is the projects, doing projects together. Well, it was very hard to get anybody off of their legacy system to do new things, but under the leadership of the Department of Energy, a little bit under and then Agriculture and US Geological Survey, the DOE sponsored a workshop to look at what should be done in the future of science information systems. And, as a result of that, because OSTI had an interesting technology of federated search, which back then was very new and exciting today it's pretty normal, but there's technology and a vendor that deep web technologies that has been very effective. We created science.gov, which is an inter-agency portal, and the principle of the federated search engine was, you don't have to change your legacy system here, your silo. This will go out to various silos and homogenize it and bring the data back. So it was the least at the service provider end, but it optimizes the silos. Well that's completely consistent with open government and everything else that's going on, is the user doesn't have to know that if you want environmental science or materials science, you have to go to DOE, NSF, DOD, NASA they all do these things. Well, how does a poor, public citizen, even an educated, scientific citizen, know that? So science.gov crosses all those portals. And that's been a wonderfully successful joint project. It's really done on the shoulders of the Department of Energy, they really stepped into the leadership, and all the agencies participate, and there's a policy group called the science.gov alliance that is chaired by National Agricultural Library, was USGS and now it's the Government Printing Office. So that continues. And, the same technology, they actually it was Eleanor Frierson who was very active internationally, and she said, 'well, we have a science portal, some other countries have a science portal, wouldn't it be great if we could share our portals and ratchet that up one level, to have an international science.gov?' And with DOE's leadership again, and this one was instead of through CENDI, it was actually through ICSTI, as a sponsor, they created worldwidescience.gov, which now covers all the continents except Antarctica. And, I don't know the exact number of databases, I think 60 countries are covered? Where there is a cross-silo search of scientific and technical information. So that started from

the CENDI cooperative activity to science.gov, which is a CENDI platform, a CENDI project, and then it has gone international. So those are the kinds of things that CENDI has been involved in, and we get very involved with policy. We're now working on a grand challenge, which is, you know, in tight times, how do you justify what you're doing, and what's the vision of the future? How do you build the knowledge infrastructure for the next generation? How do you take that science.gov platform as it is today, without any new money, looking at what every agency does, and how can they bring something back to the table, to increment the platform we have, to bring it in to the next generation. So that's kind of the agenda. Formulating it was up to now and now the agenda next year is how we can actually do it?'

KA: What's the answer?

BC: Well, on November 30th, 2011, since God knows when this tape will be watched, we're going to have a workshop on institutional repositories, and look at what role repositories will play in the knowledge infrastructure of the future. And that's a joint workshop between NFAIS National Federation of Advanced Information Services and CENDI. Because we have this annual workshop together where, you know, you said international, well, we started with national. We also have a partnership with ICSTI, and we're trying to combine those. Just like ASIS&T could be part of that. In fact, at one point we thought about having an STI summit, where ASIS&T would be at the table, ICSTI, NFAIS, CENDI, all of these, because we all have such common agendas in so many things. But that just has taken second place to other things, and budget cuts. It's a dream I have, someday we'll maybe do it.

KA: [?]

BC: Yeah, yeah. Well, IMLS is a funding agency, but they certainly might be interested in participating.

KA: [?] so much interesting stuff.

BC: Yeah. Another interesting thing about CENDI that occurred to me originally it was four executive branch mission agencies, five with NLM. And today, we also have involved the legislative side, where the Library of Congress has joined, and NARA, which is not a science agency, which is an executive branch, and GPO, but they're cross-cutting, kind of like an (ETIS mode??)[?], so there's a slice of them that is science and technology, but there's another slice that crosses the entire federal information sector.

KA: So they're joined with CENDI...

BC: Yeah, they joined with CENDI, and it's both a blessing and a curse, because the more you get diverse, the less you can be focus. But it's always nice to then get that diversity of opinion and knowledge base...expertise. But it is a go-to place. When the White House science office, even when legislation is going on, and they need, not policy, because these agencies do not make, I mean, these organizations don't make policy for their agencies, but they can provide technical input to the impacts of policy. And people come to CENDI to talk to fourteen agencies at the table. And there aren't a lot of venues where you can have conversations with that much expertise across the whole federal government when it comes to information management. So that's kind of one of CENDI's signature roles.

KA: You also mentioned projects at CENDI.

BC: Well, science.gov is the major project, but we also have working groups, and we also have these kind of focused discussions and special projects like, 'how is every agency handling personally identifiable information? Okay, that's a problem across the agencies.' So we'll have a series of teleconferences where we'll be talking about it, where people will give their algorithms, and we'll exchange things like that. So that's the kind of project work. It's very hard to get real projects, and science.gov is more than enough, for one.

KA: I'm sure.

BC: So it's more, information exchange, knowledge exchange, and sometimes that breeds 'well, let me borrow your algorithm' and things like that. So that kind of thing happens on a bilateral, multi-level basis as opposed to all of CENDI doing something.

KA: So, now that you've tapped into the largess of scientific knowledge, scientific and technical information knowledge in the US, what else is IIA doing, and how does that relate to the other projects that...

BC: Oh, do I love to talk about that's a perfect question for the president of the organization. So maybe history is a good way to describe what we really do. We started as an STI organization, CENDI was one of our flagships, you were involved, we were processing, input processing, information into the energy science and technology database. It used to be that content and technology were divisible. You know, you had print, so you created content. And then you applied technology for the distribution of these things. With personal computers, with the internet, with the online industry, everything had become digits. And so, everything was digital from cradle to grave. The division between content and technology didn't exist anymore. Those lines were very blurred. So, a company that's in information management had to also be in information technology management. And so, we diversified from being content-oriented, so a lot of the things we did in the beginning, with database building we ran libraries, at one time we were running twelve libraries across the federal government. They outsourced their libraries, and we were running them. We had a wonderful business, but you have to understand the arcane conditions of government contracting. Once you get over a certain size, \$7 million gross revenues, you can't bid on these things anymore; you're foreclosed from winning these kinds of contracts. So we were foreclosed from staying in the library business. But, this is how the library business grew into other businesses. Using a lot of the fundamental concepts that you get out of school of library, and now, information science. The first thing we did, because we were working with NASA at the time, and we were looking at foreign acquisitions, so we got into do foreign acquisition workshops. And, the intelligence community got interested in that. And as a result of a lot of those contacts, we started doing open-source intelligence. Well, what is that? That's just great research libraries. But open-source intelligence was a whole industry in the intelligence community. And I remember we did it was actually for an open part of the CIA,

called the [? Cosmos Medium Consortium Program Office]. We got a contract to tell them, I don't know what year it was, it must've been the early '90s, 'how can the internet be used for intelligence?' Because nobody understood this internet. AltaVista was just coming out.

KA: I remember this.

BC: I mean, so we did a study of how this could be used. So we got involved in the intelligence community doing a lot of open-source work. So we had STI, we had intelligence, and then, we also started doing information technology projects. Always with a focus on the intersection of content and technology. And that's how we differentiate ourselves from a lot of the companies that exist around the beltway and different places that are software engineers. You know, we really do better when we're integrating the knowledge base and the technology. But we got into information technology management, and today, for the Office of Scientific and Technical Information, we run their entire infrastructure. So we're their primary contractor that helps them run their infrastructure. And that's one of our very successful and our largest contracts that we continue we're doing that today. So, and that's very technology. We have computer scientists, and we have systems engineers, and we have systems administration, we run the infrastructure, we run the data site. So we enter in the information technology and we do other data centers, data information kinds of work. So, another thing that happened, and this actually well, was parallel with information technologies, is, since we were in twelve Air Force bases, and we were, of course, had a great reputation in all the bases, other contracts began coming out, in managing the education and training programs. Well, libraries and education training were closely related, so we started winning contracts in running that. And that was a combination of IT, it was the client side of major Air Force systems, how do you deliver it to the bases, and run reports, and stuff. And it was also managing, doing actual educational counseling and things, so we developed a very successful program in education and training for the Air Force, running those programs. So, we still have a practice in that. The government is outsourcing that. So again, we may have to move on, but we're still doing some very good things. We have work in the UK, and we were doing a lot of work in Germany, then they brought that back in-house government decision to take things back, back in-house. So we had education and training, we were running libraries, that's a declining business, the intelligence business was a thriving business, and open-

source, and we're doing information technology work. And then we were very fortunate to have a key hire, and that's Leslie Mitchell, who came out of the intelligence community, as our division director, and she has been wonderful. And she has helped us take the base that we had, in open-source intelligence and our association in the intelligence community, and jump over the fence and actually start doing analysis work. So not only were we doing collection, and we were doing pretty analytical work, but we did collections. We did medical infrastructure studies for well, over two hundred of them, over 120 countries. What's the medical infrastructure in Iraq? What's the medical infrastructure in Somalia, in Rwanda? And we found knowledge that the experts don't find. The experts know the depth, but they don't know how to collect information they don't know about. And so we fulfilled that role for about twelve years, we were doing medical information studies, all over the world. But we never actually... and we did pre-analytical, you know, we kind of concluded some things, but we didn't apply it to make it actionable, that's the analyst's job, to make the recommendations. Well, now we've actually jumped that fence, and are actually doing more and more work in the intelligence community. In the analysis as well as the open-source intelligence, which we still do a lot of. So, our, kind of and then, and this is the heart of ASIS&T, is the information sciences. That gap that exists between content libraries, librarianship, and computer science there's the information science, the link between the technology and the content, is the information sciences. The knowledge management. Now, a lot of people interpret that differently, but to me, knowledge management is the taking of that and the merging of those disciplines, to make knowledge useful and actionable. Navigators in the sea of data. And, so, today, we do work in three divisions: for civilian agencies, for defense agencies, and for intelligence agencies. Because each of those client facing and each of those clients are very different in character. The kinds of things we serve to them are information technology services; knowledge management, knowledge organization, knowledge systems services; and I'm forgetting my third service and content-based kinds of information services. And so, you know, those are kind of the areas and research and analysis kinds of services. So those are the services today we supply as a company, so that's where the company is today.

KA: So, clearly then, when you're bringing in people for new hires and some of the projects that you're working on, you clearly have a need for technology people, like computer programmers, and software engineers...

BC: Information architects...

KA: Information architects. Also, you have need for people who have librarian skills, the traditional understanding of the way that information work...

BC: The traditional modern understanding of the way things work, absolutely.

KA: Yes. And where do you find your staff that fall into that second category? What kinds of educational backgrounds are you looking for?

BC: Well, depending on those kinds of disciplines, we have a very close relationship with the College of Communications and Information at the University of Tennessee. There used to be a School of Library and Information Science and it was combined with the School of Journalism and the School of Public Relations, and now it's the College of Communications and Information. I've been on the Board of Advisors, and we have very close relationships. Students do practicums; we hire a lot of the students that do practicums with us. And we hire them here, some of them stay here, we send some of them to Washington, some of them go to Washington and then come back here. And we've been having very successful relationship there. Also, I send things out to my colleagues in the library schools and the professional communities when I have need for people. You know, we use the networks and things like that. But, when we're doing an IT project, then we're searching for people with that computer science expertise. When we do library and information contracts, we often search for librarians. Sometimes I'm, right now I'm looking for a scientific and technical information manager. I'd love to have an MLS librarian who has worked in scientific and technical information, because it's not a library traditional job, but it needs those skills, as well as the skills of managing information. Another area that we've done a lot of work in, and this is kind of a classic combination, when you look at science informatics, that's a discipline with informatics applied

to it. We did a lot of work in biodiversity informatics for the US Geological Survey. And there we hired librarians, information scientists, computer scientists, and biologists to help build a national infrastructure for biodiversity information. And that's kind of where our forte is, bringing those fields together. To get information for decision-making.

KA: How often do you feel that the people that you bring in as interns from the library and information science programs how well-prepared do you feel that they are for these kinds of new activities, outside the traditional bounds of what we think of as librarianship?

BC: We're finding that they do very well. I don't know whether it's just the ones that already come to us as practicums have orientations that way. I mean, if you want to be a public school librarian, or a public library librarian, or even an academic librarian, although a lot of people start in academic librarianship and really get into these other areas, but if you want to be a public librarian, you wouldn't come and do a practicum with us. So, we're already pre-selecting by people who want to come out and do work with us, people who are interested in non-traditional... Although today, non-traditional may be becoming traditional in people graduating from the schools of library and information science. So, fairly well, and some of them are wonderfully prepared. Some of them are pulling us along. Young people today are born digital, they're digital natives, and so a lot of them pull us along. We find it's been a very positive, satisfactory relationship. And I love hiring people that come out with MLS's. I think they're well-qualified to do a lot of things that we do.

KA: So what would you say, then, in the sum of looking over the career, and starting all the way from assistant reference librarian at Cornell, all the way through to being the president and CEO (is that correct?) of such a preeminent, important information science and information resources management company?

BC: Can I use that quote in their next bid?

KA: Sure you can. You know, in all those experiences that you had, what do you now, standing back looking at everything we've talked about and you've said, what do you identify as maybe the top few issues in the field of information management?

BC: I kind of go back to some of the things we were thinking about in CENDI. Because information is it's like air, you know, you breathe it, and it's only when you don't have it that you recognize the value of it. So, one of the real challenges in this very information-literate world, this Google-ized world, where everyone has the expectation that information is free and it's all there, and people have really been dumbed down, in terms of real understanding of research and quality of data, comprehensiveness of data, in precision as well as recall. You know, if it's on Google, they've got it. And Wikipedia, and things like that. So, one of the exciting things, and challenging things, is 'how do you make a business case for effectively managing information.' Because, especially and I'm talking like from a CENDI perspective, how the government agencies are feeling, which impacts the company directly, you know, which impacts librarianship extensively, and libraries. What's the value of a library, an information center, or whatever? We can just go to Google. Well, you can prove over and over again, yes, you can, but you may not get the best information. You're being penny wise and pound very foolish in that search for the right knowledge, depending on the problem you have at hand. So, that's one thing that I think is very important, is understanding impacts. You know, we were told by OSTP that everything you do, you have to prove you can do jobs. Course you're in a federal government space, and so how you do jobs is very important. So we looked at that problem. That was part of this grand challenge that CENDI is trying to identify. How do you show i-science to jobs. You're funding billions of dollars, a hundred and fifty billion of research in federal government. How do you prove that it's had an impact? Well first, even proving investments in science is hard enough. But you wouldn't have the internet, you wouldn't have Google, you wouldn't have a lot of things if there weren't I mean, you wouldn't have anything modern today. You wouldn't have Velcro, if you didn't have science agencies producing things, although NASA didn't invent [?] they think it did or something like that. But, how do you prove that? And then, compound that by the fact that what's the role of information in that proof? How do you prove that effective management of information has a return of investment? And that's an awfully hard thing to do, and I've never seen anybody do it effectively. [Don King?]

and [?] (yes, Amy Griffin??) have done a lot of work, and actually, my first year at OSTI when Reagan came in, I began at OSTI the day before his inauguration, and immediately he froze the federal government hiring and he wanted to do away with the Department of Energy, I just joined the Department of Energy the day before. But the first thing we did is, what's the value of the Energy database? And we had economists look at it, and we came out with using the critical incident technique, how did it help you to find information. The numbers were so profound that nobody believed them. But the fact is, if you don't have that knowledge, you can't progress. So how do you really prove that? And everything today, with declining budgets, is all about metrics. Not just process metrics, but impact metrics. And so I think that's one of the things that's a real thing today that we have to be looking at.

KA: When we talk about metrics, typically we think about quantitative kinds of measures. Would you say there's a role for qualitative measures...data as well?

BC: Golden nuggets and stories, which may have quantitative numbers in them, but they're not statistical measures. So they're not quantitative in that way, they're qualitative stories of 'this device saves thousands of lives' and things like that. In the absence of being able to have the other, which is really the bottom line proof in this zero-sum game world, it's the only thing we have, and so there definitely is a role. I mean, if you look at the news today, you see the examples of case studies, golden nuggets, you know, that make an impact on decision making. That's what you're trying to prove. So yes, it does have a place, but it's necessary but not sufficient, or we don't have anything better, so that's what we use. I mean, it has to do. It's what we use, it's not ideal but... One of the projects CENDI is undertaking, actually, with some other communities, including the technology transfer community, when you look at this i-science to jobs, there's the technology transfer community, there's the big data community, looking at data and infrastructures, we're trying to get them all together and we're trying to figure out how do you really show the impact of this process? What would you do about it, you'd reinvent it. But, how do you prove that?

KA: I have two questions left that I want to ask. One is, I would like for you to give a I'm going to tell you the questions first and you can pick which one you want to answer first. One is just to

give us a sort of basic, factual overview of your company, how many employees, that kind of stuff. The other one is, that in your biography it mentions that you have lectured on information futures. So we've talked about what the issues are. What is the future, and what would be your parting advice for young professionals just out of...

BC: Well the easy one is statistics about the company. Process statistics, not impact statistics. [laugh] Information International Associates is well, this is the question you were going to ask. We actually have, yesterday, Information International was a twenty million dollar company. We have about 180 employees in the U.S. and Europe. We, and this is the first page of all of our briefing presentations. We're in twelve states, the District of Columbia and abroad. We have security clearances, we can look at all kinds of levels of security. We are ISO certified, so we're quality ISO certified registered company. And, you know, kind of our tagline is 'navigators in the sea of data.' Headquartered in Oak Ridge, Tennessee. So, that kind of gives you a sense. But as of probably an hour ago, we've just done our first acquisition, and that's pretty exciting. That's like a Master's degree in finance in about a month, one I never thought I needed, or wanted, but I now anointed on myself. I know it's very exciting, and we have acquired a five million dollar company. Very much in the IT space to supplement our IT capabilities. So now I should say we're a twenty-five million dollar company with over 200 people. Again, in the same geographic locations.

KA: Well congratulations.

BC: Thank you. Thank you. It was a trial.

KA: You should pop champagne.

BC: We're going to do that in about a week. You watch these movies about acquisitions and mergers, and let me tell you, I could make a movie about how to do the simplest of acquisitions and be up all night trying to send papers up and back and resolve all kinds of things. It's been really exciting. In fact that's where I was yesterday, and most of the day today, and where, as

soon as we get off, I'm going to see if the money was transferred, because we're looking at very large money transfers going on today.

KA: Well congratulations, and I bet this is a different kind of acquisitions than you really thought you were going to get into when you started.

BC: When I got into the library... you betcha, you betcha. [laugh] Okay, so what did you want, a parting...

KA: Information futures. Where are we going?

BC: You know, the more things change, the more they stay the same. It is clear in today's world we have too much information. Everybody feels it, the pressure's on it, we have more information than we can absorb, this is not new. The Weinberg Report in 1964 said we had information overload, and the whole concept of analysis was to conquer information overload. We thought technology would solve it. Well, what did technology do? It made it worse. Well, maybe it will solve it, but in the meantime, it's made it a lot worse. So I think the information future is, the last generation was the Google of the world, getting access. The next generation is making that access usable, making that knowledge usable. You know, the future is Star Trek. Computer, tell me this. Watson is a path along there. That's the future. Now you laugh and say, 'yeah, sure, we're never going to get to Star Trek's computer.' I was just about a year ago reviewing the Xerox, or was it Apple, Apple did the Knowledge Navigator. It was this ten minute video where they had this guy who had an avatar. This was before the internet, before you really had the world wide web, before you had a lot of those things. And we laughed at it. We said, this was I think, 1989? We laughed, we said, 'sure, sure, and how are you ever going to do these things?' And almost everything in that video is second nature to the young generation. Duh, you know? And so that Star Trek computer is where we're going. It really is. Now how we get there, and how that really happens, is the challenge for us. I think that's what it is. Now we're back in baby steps, you know, what's the future of repositories and the knowledge network and the knowledge structure, but where we're going, is all of that stuff, so that you can, through voice, not through keys, ask a question and through the Watsons of the world, networked a

thousand million times, you get your answer. Now, if I knew how to get from here to there, I would be retired.

KA: You'd have a big company.

BC: I'd be retired. [laugh] But I think that's what we need to be thinking about. And I think that the skills of information professionals, I see all the time, government agencies jumping into things and re-inventing stuff. The latest re-invention is 'gee, you know, we can't really tell which corporate entity this is. Is MIT the same thing as Massachusetts Institute of Technology? Is the same thing as massachusetts.mit...' You remember back when we were working on creating the database, we had corporate authority files.

KA: Yes we did.

BC: The computer hasn't conquered that entirely. Now, there are many programs that do a lot of stuff that the general public doesn't have access to. But, you know, these problems are re-inventing themselves. But somehow we have to get from here into the Star Trek computer. And that's where the future is, that's where we're going. And we think it might be a hundred years out, or probably twenty years out.

KA: And so for future LIS professionals, your advice would be...

BC: Absorb as much technology as you can, and never lose sight of the fact that it's content that you're working with, and the technology is a means to the end. Now, it just occurred to me I heard a very bright man, Mike Nelson, who I met when he was senior staff for Al Gore, back when Al Gore was a senator, he's gone on to do many things, he's worked for IBM, and now he's working for CSE in their think tank. He's saying content may no longer be king. Collaboration is king. And there are some interesting things when you look at what's going on in the world about challenges. You know, you throw a problem out and it's solved around the world by the best thinking. I remember the MIT red balloons, and where are they, and how do you know. So, collaboration is a new way of analysis in some ways, so, but even if collaboration

is king, content is still queen. So, get your technology, don't forget your content, and collaboration is going to be the name of the game.

KA: Thank you Bonnie!

BC: Great! That's it, we're done? I think that was enough.

KA: I think that was good! That was a good shot. Okay, congratulations. Well done!

BC: Alright! Let me go see if we've got our transfer.