

**University Corporation for Atmospheric Research
National Center for Atmospheric Research**

Oral History Project

**Interview with Harriet B. Crowe
June 27, 1990**

Interviewer: Earl Droessler

TAPE 1, SIDE 1

Droessler: This is Earl Droessler and I'm at the National Center for Atmospheric Research in Boulder, Colorado, on Wednesday, the 27th of June, 1990, and I'm here for an interview with Harriet Crowe, the vice president of UCAR, for corporate affairs. Good morning Harriet, nice to be here.

Crowe: Good morning Earl, my pleasure.

Droessler: Harriet, you were one of the very first employees at UCAR, I believe it was back in the mid-1960's that you came on board. Tell us, how were you attracted to UCAR, and what were some of your first duties as you came on board.

Crowe: Actually Earl, it was earlier than the mid 1960's. The first contract and funds from NSF came in June of 1960, and Walt Roberts and then Mary Andrews, now Mary Andrews-Wolff, hired me in April of 1960, I was on the payroll of the High Altitude Observatory at the University of Colorado for about a month and a half before UCAR ever existed but doing the job of secretary to Mary and Walt in those first months.

Droessler: Tell us a little bit about the early days of UCAR, what was happening as far as the people were concerned, the few people that you were associated with, and also the early getting together of the Board of Trustees.

Crowe: Yeah, I've thought about that since we talked yesterday some, but let me skip back a minute, because one of the things you said was what first attracted me to UCAR, and the answer is germane to how, I think, how the whole center was shaped in the early days, and it had largely to do with Walt. When I was here in 1957, as a new bride, my then husband was enrolled in an honors astronomy class at the University of Colorado. He was not able to go to the first planning meeting for that class. It turns out that class was to be taught by Walt Roberts, and Alex, my husband, asked me if I would go to find out when the classes were to be held, he had to work that evening at a matter of fact. I did. And Walt in his usual style said, well, why don't you come to

the classes? And so, the...I attended the semester of an honors astronomy course that Walt taught in the fall of 1957. He held the classes at his house and we would go there. He and Janet always had a fire going when it got cool, and cookies and cider and hot cocoa for us. Class of about twelve people. Walter has each person in the class adopt the persona of a famous astronomer, and debate then-current social issues as best we could infer that astronomer would have debated them, had he been or she been, there. I was Ptolemy, Walter and I agreed about that. In January of this last year just before he died. The important part from that, of that for me in connecting with NCAR and UCAR, was that Walt knew me from the experience in this astronomy class. And I knew of him as well, and decided to apply for the position which had been advertised around the University, even though I had literally never set finger to a typewriter, and it was a secretarial job. And the...as staff people came to know me over the months that followed, the story of the argument that went on between Mary and Walt over whether to hire me or not, after all, a secretary who didn't know how to type in those days wasn't worth much of anything. So, there was one qualification attached to the job offer, and that was that I would take a course in typing at the University of Colorado during the summer school. So every day I would go at 6 a.m., and take a typing course from 6 until 8, and then I would go to work at TB-8, which was an old Quonset hut that we were then located in on the campus. It doesn't exist anymore, and I would practice all day long on Walter's correspondence, driving him and Mary absolutely crazy in the process, because I was a rotten typist then and still am. Walter was said to have exclaimed, I don't give a damn if she can't type, she's bright and I want her, and that concluded the argument about my hiring. And so my attraction had to do with the connection with Walter and the way that, that relates to what happened at NCAR and UCAR in the early days, was his sense of commitment to people, and not experimental approach, but adventurous approach. He really went after folks, whom he regarded to be of very high quality, with the right sense of spirit and adventure to get NCAR and UCAR going. And that has largely prevailed, we've gotten bigger of course. But in the early days around the place, it was a marvelous collection of very interesting, creative folk. And I guess of the early days, that's what I remember most.

Droessler: Where were you located at that time, the UCAR headquarters?

Crowe: Our offices were first of all, in a building called "Temporary Building number eight," which was a World War II barracks building which existed on the University of Colorado campus, now gone, not the campus but the building, and in its place the George Gamow physics tower, so it's kind of near where the football stadium is on the campus. Very soon after that, we moved into the High Altitude Observatory building, which was under construction at that point next to the Sommers-Bausch Observatory. Walt had raised private money to build both the observatory and the office building and we had some space there for a while. We were then after that in the Armory building, in back of Macky Auditorium on the campus on Univ...I mean College Drive, and after that at 30th street, also on University property, in a combination of research buildings that was put there, built there by the university, and some trailers out in the parking lot.

Droessler: So the UCAR began 1 July 1960.

Crowe: 1 June.

Droessler: 1 June 1960.

Crowe: 1 June 1960, officially.

Droessler: And, that moved off into the future. And then you had to gather the trustees. Who were these early trustees, and where did you meet, here in Boulder, or did you have the meeting here in Boulder?

Crowe: Well, knowing that you and I would be talking today, I went back and reviewed some of the oldest minutes of the board and of UCAR. And of course, the official meetings and the minutes that were kept, predated the 1 June 1960, because the corporation existed prior to that, and the University Committee for Atmospheric Research, and you were involved in many of those, in fact I saw your name a lot in these minutes that I looked at. And so there were meetings at many places leading up to the 1960 opening, if you will, of the UCAR offices in Boulder. They were mostly Washington, D.C., some Chicago. After Walt was hired as the president and director, and the quote, unquote, permanent location for NCAR and UCAR was determined to be Boulder, the meetings then were held here, in Boulder every time. The first Board of Trustees was made up of two representatives from each of the member institutions, and I was...I was interested to be reminded, when looking at these records that the thirteen...we talk about fourteen original members, without remembering that there was some peculiar prohibition about the University of Washington joining any other corporations by their own bylaws, and so technically, the University of Washington was not among the original fourteen, but joined about a year after the original thirteen members. So there is a board of trustees of twenty-six people, two from each institution appointed by the chief officer, and that group elected an executive committee, which was the group that did most of the work. Henry Houghton, Tom Malone, Gill Lee, George Benton, Seymour Hess, Horace Byers, names that you and I know, many of them still involved in our activities. One of the things that I was reminded of in reviewing some of these records is how persistent some of the themes are we at UCAR and NCAR deal with now, and have dealt with since the very early days. My job back then of course, was to do the support, the mechanical work of producing the documentation, and there was one motion on the minutes that urged that more advanced material be provided to the trustees with the agenda so that they could deal with the matters better. I can remember cranking out on the mimeograph, sheets, with the purple machine that you hand turned and stuff these materials. And we're two weeks ago, in my office doing exactly the same thing, not the hand crank anymore, but assembling these notebooks. So that I was not privy to the discussions of these matters, but in job sense I have participated in them, so reading the minutes is an interesting view back.

Worries about the role of the High Altitude Observatory at NCAR from the very, very beginning, with Walt coming as director of NCAR, from his position as director of HAO. There was concern that this would detract from the focus of NCAR on the atmosphere. What would UCAR and NCAR do with the High Altitude Observatory? There was even comments in some of those

earlier records, that clearly HAO would not be supported by the National Science Foundation as part of the NCAR budget. I thought that was beyond the pale for folks to consider. There were a lot of worries then and now about interdisciplinary studies. Clearly the atmosphere has always been seen by many people as the linking feature among the earth's systems, to use the present day language. Horace Byers, Tom Malone and Henry Houghton and these were all very persuasive and farsighted in looking at atmospheric sciences as a way to link together these disciplines. Early fellowship applications, or fellowship recipients, were deliberately chosen from among the so-called neighboring disciplines in order to bring the rigors of physics and chemistry, the traditional studies into the-then meteorology/atmospheric sciences. And we still worry today about interdisciplinary studies. It was pointed out in some of these records, you cannot have, in those days anyway, and perhaps still today, genuinely interdisciplinary activities underway in a university because the appointment system is so geared to departmental lines and peer and disciplinary acceptance, and that a place like NCAR was the perfect place to do such studies. Today we have the Environmental Societal Impacts Group; it's been here for a very long time. One of Walt's early interests. And systematically, every single budget cut that the Board of Trustees has had to consider, that activity has been protected. It's very small, but again and again the argument is made that NCAR is the only kind of place we can do that. We're seeing changes in that now in the university community I think, but I believe that the founders of UCAR and NCAR were farsighted in that matter in particle

Droessler: Well, don't you also feel that the appointment of Walt Roberts as the first director and president gave the UCAR, NCAR concept and opportunity to explore in this area of interdisciplinary scientific work because this really was the background and the character of work that he was doing in solar terrestrial effects.

Crowe: Absolutely.

Droessler: He depicted the good leader for keeping that kind of activity in line and developing it within the UCAR.

Crowe: That's right, and in addition, Walt had the notion that science was to quote him, in the service of society, his...if you hark back to the astronomy class story, his forcing the students to think about science, and the work a scientist does in the context of issues that affect people around the world, is a precursor of that as well. He didn't touch a piece of science that he didn't think about it in terms of how it would affect and improve the condition of life as we all know it on this place. His work with Carl Hodges on the heliflights and how to get grains that will grow in seawater, in recent years, in another example of that. And so yes, he saw those opportunities, looked for them, created them, helped promote them, from the earliest days, and I think that NCAR still does that. If you look at some of the early scientific appointments, Jim Lodge, a chemist, was among the very first. And the "blue book", the famous blue book, talked about an atmospheric chemistry program, predating the past five years' worth of academy studies and how important that is by twenty-five years, a quarter of a century, folks twenty-five years ago knew full well that the chemistry of the atmosphere was going to be important to study. Vin Lally, with his genius

in bringing techniques to apply to study on the atmosphere. Ed Martell, who branched off later and did a lot of health impact studies and analyses of various substances in the atmosphere. And so yeah, Walt set a tone for that very early on that has persisted.

Droessler: And he had enough foresight and he had enough courage to move forward on that kind of activity, and the Board supported him.

Crowe: I was going to say he did himself, and then he was backed up by equally visionary folks on the Board. George...excuse me, Henry Houghton, Dick Sander, Maureen Iberger, Tom Malone, a whole raft of them, Horace Byers and...

Droessler: So in the early days then, the very first days, the trustees were the appointees, the two appointees from the universities, the founding universities.

Crowe: Right.

Droessler: Very early on the Board started to expand, started taking in more universities as members and then at some time, they...the election of the trustees from the members pool must have occurred. Do you remember when that took place?

Crowe: Well, I tried to find that before I came over here. The first, the thirteen universities, and then fourteen as soon as the University of Washington got its stuff straightened out, was appointed two each, and so there were twenty-eight trustees, and the executive committee did most of the work in the early days in terms of meetings. From the very...another persistent theme always has been, how open or closed should UCAR be with the proponents of staying small saying you need the small management group, you get unwieldy, you have--the role of UCAR is to be the manager, clearly we will be open to all universities for participation in the research and facilities program of the center, and that has been clear from the very beginning as well. There was another set of folks who said no, no. We have to recognize that as we grow and be successful, it is likely that university programs will grow and be successful, and there will be more and more people that want to be involved with us, and that that is appropriate course for us to take. I don't know Earl, exactly when the agreement came to expand the membership beyond the original fourteen. It was, I can bracket it, it was after I left in 1966, and before I came back in 1971, I had a span when I was away for a while. And at that...during that period there was a change that the two members appointed from each institution would represent those institutions and then elect the Board of Trustees, which would be comprised of sixteen, fifteen members, and the president, ex-officio, and that's the way that we operate today.

Droessler: And the fact that we have, that UCAR has grown to fifty-eight member universities, I think, tells the story of what happened. there was great encouragement from the National Science Foundation, and from the Board of Trustees, for universities to develop departments of atmospheric sciences at the graduate level particularly, and Ph.D. programs. That was the mark of entrance into the UCAR establishment, was a successful Ph.D. program in the atmospheric or

related sciences. Then more recently, UCAR expanded to include physical oceanography, so it's been a wonderful record, I think that UCAR has carved out.

Crowe: Well, and I think it's a natural evolution of this earlier context we were talking about, of the early trustees, and the founding fathers, and Walt Roberts recognizing that the true and fundamental breadth of atmospheric science is that you just don't separate a parcel of air off from a piece of land or a hunk of ocean or the sun, and say that that's what we live in and that's what we need to know about. The criteria for membership has been debated at great length among membership committees and with the members, and have been changed, as you just mentioned, to say atmospheric or related sciences, so that for example, we now have one member admitted on the basis of its oceanography program, with this institution, this is Old Dominion in Norfolk, Virginia, never having had a program in atmospheric sciences, meteorology type, and never planning to. We anticipate some applications next year from programs, from one institution in particular, that has an interdisciplinary program in earth sciences. It's an interesting debate always, when the members deal with this because you have the push and pull of, we're really the atmospheric scientists, harking all the way back to 1960 when, how can we have the high altitude observatory, that's not meteorology, and the members say, well, we're atmospheric scientists, we're not geologist, we're not biologists, we're not ecologists, and the other pressed to say yeah, but we're talking about this earth, we're not talking about that square kilometer of air or land or sea only.

Droessler: Since you were almost exclusively involved in the corporate affairs, UCAR affairs, and provided essential services to the Board of Trustees, you have a unique chair from which to view many of the critical activities that occurred during the development and the years that UCAR has existed now, almost thirty, were there some surprises along the way...

Crowe: Surprises.

Droessler: ...that sort of had the Board to stop and pause and provide some new evaluations or new directions for the corporation and for the national center?

Crowe: Yeah, there were some surprises. There were also, and I'll mention some that occurred in a minute, there were also general themes as well that persist, budget problems, from day one. The Board has always dealt importantly, with the National Science Foundation as sponsor over budget problems, and that dates back to day one. Personnel problems, how do you attract them and bring in the right sets of people, of right quality to do the kind of program you want. How do you do that without unfairly competing with our university friends, and whom we depend for support and vice versa. The training and education programs have from day one a worry. How do we, how does the atmospheric science, meteorology community attract high level graduate students. And the Board has dealt with all of those issues since day one, and continues to today. The surprises. We got, and I'm really using an editorial we here, because once again I was in a support role during this early time. In the late 1960's early 70's maybe, early 70's mostly, Walt got new visionary views about roles that UCAR might play, education and training was an

important one for him, and he'd listened to the Board talk for ten years about how important that was to the science. And he made proposals to establish committee, a committee on education, I think he called it. Which was, in retrospect, very, very farsighted, but which was seen then as a deflection of UCAR's main mission, to manage and operate NCAR, and furthermore, as a usurpation, is that a word, of the university role to do the education and training. Another tension that has existed in the system for a very long time. The early years were marked by a very favorable, receptive condition in the sponsor in Washington D.C. and the federal budget for science. So that the growth of NCAR was relatively simple to achieve in those terms. We weren't dealing all the time with having to reduce the program and tightening it up. The...Walt's international interests had expanded significantly by this time, and in fact that's another general theme. Way back from 1960, the Board talked about what do you do with international affiliations, because clearly the atmosphere is international. We may come back a little later and talk about what we're doing with that now. So the biggest adjustment, the first biggest adjustment, came with the Joint Evaluation Committee that you and I have talked about. With the community sort of rearing back and saying let's stop, and take stock, this was after maybe ten, eleven twelve years of existence of the center. Let's take a look at what we're doing. Is the place headed in the right kinds of direction? Are we satisfied with the level of quality of work and staff there? Do we measure up fairly against what the universities are doing? Is the program still meeting the needs of the university community? That resulted, as you well know, with Walt resigning his position as president and moving to other activities with the Aspen Institute for a long while before he then came back and took up a very active role with us again later. And it was a traumatic time here for everyone, with literally every single person in the whole institution receiving an individual performance review. Everyone, secretaries, file clerks, technicians, engineers, scientists and so forth. It evolved into a system of scientific appointments in particular, that was both more rigorous in description, and more rigorous in application than the center had had before. But there was no change, in my opinion, in the fundamental direction of the place. I think we pulled back a little bit then, institutionally, on some of these new directions that Walt had begun to push toward, and consolidated, if you will for a while. And the...Francis Bretherton, who became president at that time, had the job of...as some of the shaping us up, that's an over simplification, but he was brought in with the impeccable scientific credentials to sort of bring order to the scientific program here at NCAR. He took that charge very seriously.

Droessler: At the beginning I believe, the Joint Evaluation Committee was established to look at the quality and quantity of the scientific output of NCAR. And having done that in kind of a way, they then turned to the management of the organization.

Crowe: That's right.

Droessler: The management of NCAR, and the management characteristics of the Board, and the corporation itself. And that, as you said, resulted in Walt Roberts retiring early, resigning, and Francis coming in, who took over both jobs, president of NCAR, and director of NCAR. And with his scientific qualifications and intuition and management ability, I think was able to provide an upgrading and a stabilization of the NCAR program.

Crowe: Yeah. One of the features in the, I think in science communities in general, but certainly with respect to the atmospheric science community, meteorology, is its penchant for self-examination. Now we both know about the peer review system that the National Science Foundation employs which has virtues and problems as well. But, it is a deep-seated tradition that scientists and institutions look at themselves as toughly as you can, as objectively as possible. And so the JEC was, I think a natural extension of that attitude towards making sure, self-correcting kind of system that we have. The earliest reference I found this morning to any evaluation of program was I think, something like October of 1960. The place hadn't been in existence three months yet, and Henry Houghton was saying, we got to take a look and see whether the programs are any good or not. We must have an evaluation system, and so it's a tradition that we've grown up with, and I think everybody is quite comfortable with. but you're right, that one took a different turn, and ended up taking a look at the management structure in a way that rippled through the system internally. With organizational changes flowing finally, in terms of divisional structure, and everything else.

Droessler: Harriet, I liked the way you noted the principal activities of the Board, the dealing with the budget on an annual basis, dealing with the negotiations with NSF, personnel policy matters, education and training, and the international aspects of the atmospheric sciences, and then there was another one that always was there and needed to be attended to. It went under the group of university relations. What did that develop over time as you saw it?

Crowe: Well, you're right that it was, has been and still is, maybe the most fundamental aspect of corporate life, and NCAR's life in the community. we are after all established by the universities to extend their capabilities and programs to extend what goes on in the university system, and to provide a wide range of services. Early records show university folks who were the Board of Trustees, and UCAR's bosses, were very worried that staffing the center, for example would raid all the good faculty. that if NCAR became too good a place, wouldn't that draw away all the quality faculty from university departments, who after all, were having difficulty finding the qualified people to teach in their own programs. So the tension between UCAR's commitment to manage and operate NCAR, and its commitment to do that on behalf of the universities, produces a tension that exists all the time. That you have to correct back and forth for. So the Board itself, early days, dealt with university relations, but subsequently, when the membership expanded, there has been appointed now for probably fifteen years, and its in the bylaws at this point, a committee called the university relations committee. Which is elected by the member representatives each October. It's a committee, the bylaws specify, of at least twelve members. So we're talking about a group that is the size of the Board of Trustees. No authority rests with this group in the same way that it does the Trustees, and yet, it's a very important mini Board, if you will, that has an unlimited hunting license to talk with the president, and those of us in the corporate staff, and the activities that UCAR now manages and operates about anything that's bothering them. their charge is to go out there talk with their colleagues, listen to what we're saying, listen to what they're saying, help us understand needs and concerns in the university community, and help their friends and colleagues understand what it is that's going on here. It

has had a spotty history, is the right way to talk about it. We've been through a series of presidents from different backgrounds. And the two most recent, I think it's fair to say, Cliff Murino and Rick Anthes, have regarded that committee very, very importantly. And it has in fact grown in its range of interests, and the use to which we put it here. Some of the prior presidents didn't have the university experience that was quite so direct, and had their eyes on other goals. Bob White was very concerned about things in Washington, for example. Francis Bretherton was, quote unquote, getting NCAR in shape scientifically, and Walt Roberts in getting the place going. So if you go through our sequence of presidents, you find that the last two in particular have been highly sensitive, and appropriately I think, to the worries in the university community. It's a fine group. They are usually chosen not from the members representatives who have other avenues to influence and advise us, but are younger people perhaps, newer in the faculties, different universities than tend to be elected to the board of trustees. Not necessarily the big, however many there are now, of really high quality atmospheric science programs. So they meet twice a year, they receive an awful lot of the same information as background that the trustees do, in terms of position papers and proposals, and reports, and documents. I can say, as a semi personal aside, as far as my staff is concerned this is the favorite committee because it tends to be a little bit, I don't know what the right...I don't want to say flaky, but it's a wilder group. They're marvelous, they come in charged to go after everything they've heard, and they know they don't have to take any action, and so it's wide open, it's great.

Droessler: So it's developed into a true sounding board.

Crowe: It's a true sounding board.

Droessler: And so they are chosen from the university faculty, and so they're out there where the signals are being generated, and they can bring these signals, whatever they are, positive or negative, about the NCAR, UCAR activities to this university relations committee, and sound off.

Crowe: that's right, and one of the particular things that they have done that has been an enormous help to us in the past five years, harking back again to the matter of competition between the national centers and the universities, a particular point of focus for the complaint about competition has always been the non NSF funded programs at NCAR. Is the center competing, especially unfairly, with university investigators, going to Department of Commerce, or EPA, or FAA or elsewhere for project funding if you will. The complaints have always been semi vague. Just assertions that the competition existed, and the university relations committee undertook to take a look at our policies and procedures, and essentially themselves, said, let us help you. We'll talk to our university colleagues about that, we'll receive all the complaints. You've got to have a better set of guidelines than you do. Talk with us about those, let us help you develop them, and then we'll set ourselves up as a lightning rod for the complaints. And that's been...it's been marvelous. We've been able to demonstrate that the competition is for, among a very small percentage of the total dollars flowing to atmospheric sciences in the US, universities and NCAR alike. And we've had three complaints in the last five years, all three from the same person I might add. In none of those instances has university relations committee found that we

competed, we NCAR competed unfairly, with a particular investigator or investigators. And it has served wonderfully to help bring some facts to bear in those discussions of competition.

Droessler: Now Harriet, you mentioned that there is a second activity that you'd like to discuss, that I think began under Francis Bretherton's operation as president and director of NCAR. And it has to do with the expansion of UCAR program activities.

Crowe: that's right. In thinking about big turning points in the institution's history, where I believe the JEC was warn in the sense we've already discussed. The other has to do with a recognition that began to develop, conceptually, under Francis' leadership, that UCAR could serve a broader role on behalf of the universities in the country, than just the management of NCAR. And he began to push, just before he moved on to other things, he began to push in the direction of promoting what he called, cooperative university projects. Which would not necessarily be NCAR based programs managed and operated by UCAR. But UCAR managed programs in the community that NCAR might participate in, and in that context, NCAR would have been similar as any university with respect to UCAR. He left before that, left the presidency before that came to any specific definition, but the idea had started, and when Bob White became president following Francis, he picked up that concept and developed it very very fully and beautifully. He was I think, really well based to do that. He had a national view from his many jobs in Washington, that it was different than the view of the country and the atmospheric sciences in it than either Francis or Walter had. So he was able to bring, as I said, a very high degree of specificity and directness to that concept. And, UCAR moved from managing and operating NCAR when Bob White took over as president, to the point where we are today, where we manage and operate programs that total about \$80 million, 50 of that is NCAR based and the balance is, 50 or 60 depending on the , and the balance is other activities. UCAR, for example, now operates the Institute for Naval Oceanography in Bay St. Louis, Mississippi, on the Stennis Space Center there. this is a small, about a \$4 million a year research program dedicated to improving ocean prediction models. It's funded by the Navy. Their interest is eventually, anti-submarine warfare use of the acoustic properties of the ocean. But, they recognize that they have got to do a lot of fundamental development in the ocean models before they can get to a stage where it's useful, and they also recognize that the expertise for that lies largely in the university community. So the Board on ocean studies of the National Academy came to UCAR several years ago when Cliff was president, and asked if UCAR would consider managing and operating this laboratory and research center on behalf of the Navy. And UCAR was seen then, as the avenue to the university expertise in this field. In any case, Bob White made the...developed the concept initiated previously, and took what was called a prospectus to the member representatives, the member universities, who endorsed it, that followed discussion in the Board of Trustees on the subject. When Cliff was hired to be president, the Board set aside a special meeting and debated, as they were looking for the president, this was before the selection they made, they debated whether that was the course for UCAR to continue on or not. They wanted it to be a conscious choice whether to continue the expansion of responsibilities was appropriate, and they reaffirmed the prospectus that Bob had gone through discussing with the members. So when Cliff became president, he was charged by the Board, specifically, to continue that role for UCAR. So we have

a three-part mission to support the atmospheric sciences nationally and internationally, to develop technology, transfer mechanisms, and to operate laboratories. We have six ways, six ways, six roles that we carry out we see doing that. Some of them are service oriented, we have programs in UCAR, we can talk about some of the specific ones if you want, that tend to be responsive to a need that either a federal agency or university community has. We have ones where we propose and create programs on behalf of the university community to the federal sponsor, we've got things like the cooperative program on meteorological education and training. The COMET program which is aimed at training forecasters to use the new, modernized techniques that the weather service is deploying around the country. That is just one of several. I would say that after the JEC, that that was in my experience here, a very major turning point, the Bob White presidency in bringing us to this broader forum.

Droessler: When was the UCAR Foundation established, and what is its purpose?

Crowe: The UCAR Foundation was established under Cliff Murino's leadership in 1985, I think is the date of incorporation. Again, we have to acknowledge Walt's role in this, he saw the importance, others did to, but he was right there with Cliff and others in talking about the impo...recognizing the importance of not only taking the products, if you will, of research done at places like NCAR and making sure that they were of benefit to humankind, that's science and the service to society again, that Walt has brought to all of the things we've done. He and Cliff wanted to take advantage of the fact that the national law had changed in this regard. Which now, at that pointed, vested ownership of the property developed at a place like NCAR. Even though developed with federal money, the ownership was then vested in UCAR, which gave us a base of property which we then could say, okay we own this piece of software, or we own this equipment, we own this patent, we can choose to exploit it ourselves. And it was under Cliff's presidency that the foundation itself was established as a subsidiary corporation to receive those properties, if you will. In our staff jargon we say, well, we're not ready to throw that over the fence yet. UCAR owns a piece of property, you have lots of discussions about marketability, you talk with people out there, then you quote, unquote, throw it over the fence to the UCAR foundation which can then establish private companies, or enter into licensing agreements with private companies and earn revenues from those ventures which can then be transferred back to UCAR for un-earmarked use in program development. The foundation is required by its bylaws and article of incorporation to operate for the benefit of UCAR, and there are agreements relating to that revenue transfer so that we have not created something that is going to go off and line its own pockets, if you will, it has a sole purpose, there's overlapping membership on the two Boards of Trustees. The Board of the Foundation is appointed upon ratification by the UCAR trustees, so the links are close and intentional in that way. Anyway, it was established in 1985.

Droessler: It's a little early to expect to have any funds developed by this organization.

Crowe: Well, it's a little early, but there have actually been revenue flow. Small amounts, ten, twenty thousand dollars at a time, and mostly from things such as licensing from the NCAR graphics software package developed by the scientific computing division. The mass storage system

which was developed at NCAR was spun off and a company set up, and they have now sold systems for installation on some of the big computing centers being developed around the country. So, we have not seen any revenues from it yet, there's been a trickle, but it is a long-term thing.

Droessler: Please talk about the three affiliates of the program. I believe you have been involved in this activity.

Crowe: Yes, and once again, the acknowledgements to the early founders and developers of UCAR and NCAR. International, in one, and as I mentioned earlier, some of the 1960 minutes I looked at talked about the international connections that UCAR, NCAR and the atmospheric sciences had to have. There has been, from the beginning, an interest in international, non-U.S. institutions to affiliate in some way with UCAR, to become members. Now the category of member is a very precious one, because the institutions who are members with a capital M, are responsible for the governance and management, and the election of the Board of Trustees. And that's been a name not easily shared even among U.S. institutions as we have seen. So, it was finally agreed, again during Cliff Moreno's presidency, to establish an experimental program called, International Affiliates, where the International institutions with relevant programs, and good programs, and there are many, could be formally affiliated by name with UCAR. And that was the first of the three affiliated programs that you're alluding to. We are...

Droessler: What are...just mention one or two of the international institutions.

Crowe: The Max Planck Institute in Hamburg is a member, the University of Stockholm, excuse me, not a member, I should know better, and say it's an affiliate, the University of Stockholm is an affiliate, there is an institute in Munich that is an affiliate, and I'm sorry I don't remember it. There are six charter members. We are in the process right now of expanding that to get broader distribution. five of those six happen to be in Germany. Stockholm is the only non-German institution, and this is a matter of history and accident of who traveled where and when, and so forth. The inaugural meeting of the groups was held in Hamburg, Germany last September, and they agreed that an expansion was appropriate. So we are presently inviting approximately fifteen other institutions around the world to say whether they are interested or not. Oh, I know, the University of Tokyo is an affiliate with Matsumo's program there. There will be two Australian affiliates, there's an institute in Italy that's interested, there are several in France. The ECMWF is likely to become affiliated. This was a program that was approved by the member representatives, again not without some nervousness about getting too big and too expansive, and how are we going to handle it all. It's only in the past year and a half really become very, very active. And this has been under Rick's, Rick Anthes leadership.

Droessler: So the corporate affiliates goes back to Walt Roberts doesn't it? And how...

Crowe: Right.

Droessler: ...large an organization is it today?

Crowe: That has the same year start date as the foundation, it was about 1985 when the program really got cranked up. Walt has always had a lot of ties with industrial folks. He'd done a lot of fund raising with them, he was on Boards of Trustees, and he was very at ease in those circles. The corporate affiliates program presently has thirty-two members, each of whom pays eighteen thousand dollars a year to belong. It's self-sustaining, there's no cost in dollars to NCAR or UCAR. There's cost in terms of time because all of us participate in the various presentations or programs. But the direct costs are completely self-supporting. And the members are...it's a very wide ranging...Weyerhaeuser Industries, Burlington Northern, AT&T, IBM, Cray, Digital Equipment Company, and then small firms, some of the names of which I can't even remember. All of them however, with interest, weather related interests of some kind or another. Alden Electronics is a member, TRW is a member. Weyerhaeuser for example, obviously an interest in climate and tree planting, Burlington Northern interested because if things are going to change so that the wheat crops are going to be, I don't know, thousands of miles further northward on the continent, they want to know where to put their track heads. If there's coal mining is going to go away as a cr...those are the two crops that they carry most, wheat and coal...(tape ran out).

Side B

Crowe: The, we were saying that Weyerhaeuser and as an example, has interests in climate and weather, and Burlington Northern as well. So the corporate affiliates members pay their dues. They receive, there are two meetings a year around special themes that are potential interest to their strategic planning needs. They can request information of a very particular topic if they want. They get visits from scientists here. We've seen a lot of benefits from this program in the NCAR system already and other UCAR activities, including for example, contributions of computer equipment from Deck and some of the others for the Unidata program, deep discounts of computer equipment to some of the programs. Hewlett Packard a member, stopped an assembly line in order to produce for us a spectrophotometer that our folks wanted to carry to the North Pole to do ozone whole studies there, and then contributed the instrument to boot, it was about an eighty thousand dollar instrument. The Deck has entered into an agreement with us for a visualization laboratory where they are supplying equipment, money, and people to develop visualization techniques, where their interest clearly is a market that is potential and ours is to improve the tools that are available. So there's a lot of interaction among the affiliates and the UCAR and NCAR programs on a science, technical, and engineering basis as well, in addition to these general level symposia. The third affiliates program is one that doesn't exist yet, but is an idea that Rick Anthes has promoted. People from non-Ph.D. granting institutions, largely at a particular A&S meeting here in Boulder as a matter of fact, a couple of years ago said, we, the non-Ph.D. granting colleges, are an important part of the atmospheric sciences community in this country. Our students tend to go to your graduate schools, Ph.D. granting institution folks, and we'd like to be affiliated with UCAR in some way too. And couldn't we consider whether there isn't a formal, official way to do that? Once again, the worry about member with a capital M came into play. there is a committee of the members called the membership committee, and they

have been the ones who have monitored, if you will, both the international affiliates and this academic affiliate program as it's now called. And there will be a proposal made at the October 1990 members meeting coming up, to establish this academic affiliates program on an experimental basis. The worries in addition to what the proper role for member is and not, have to do with that meeting already being very unwieldy, because if you take fifty-eight times two, we tend to get on average, about ninety people I guess, from the universities at that annual meeting in October. And it's a crowded, difficult meeting to arrange, difficult meeting to have it be useful to the folks. The thought of adding two times thirty, or one times thirty, or however many representatives each academic affiliate might have, to that meeting is tough to imagine. And their interest is to be represented in some way at those sessions, because they say that the ties with the people that are in the Ph.D. programs are important for us to establish, and that's a really good time to do it. We're thinking about, and this is a real unusual aspect, going to an AMS-like arrangement, where the members meet in a business session, and that gets followed by some kind of program discussion overlapping with the academic affiliates people, I don't know. There are dues proposed for this group, they would support their own travel. All of that intended to be expressive of their commitment and their real interest to participate in it. Also, the corporation doesn't have the resources to, without severe impact, to support the activities of another large set. But the idea is to expand the constituency base for atmospheric sciences, to bring the non-Ph.D. degree granting schools in closer contact with the Ph.D. granting institutions who are members already. And if the members concur this October, we then will set the program up, but that is one that doesn't exist yet.

Droessler: All this expanses of the breadth of UCAR activity is really very interesting. But let me assume that I am a senior research scientist at NCAR, and I begin that the Trustees have to devote time to a twenty, thirty million dollar program beyond NCAR, and how much time now are they devoting to my concerns? So now, do you detect a tension building up there within the NCAR establishment?

Crowe: Absolutely. And it's wonderfully ironic in some ways. I also have...I know that the same staff has complained, those darn trustees, here they come again, I wish they'd stay out of our hair. So you can't...there's no way to make anyone happy, that the level of trustee attention is just right, I think, that's another thing I think we just have to say is always going to be either a little bit off in one direction or the other. But yes, NCAR, in the past several years, has worried and talked with those of us in UCAR who have anything to do with it a lot about, isn't the UCAR expansion detracting? Doesn't that take away from UCAR's ability to help us NCAR, your advocacy and promotion of our programs? UCAR is our advocate with the sponsors. This is coupled with a period of declining resources available to everyone in the community from the National Science Foundation and others as well, so that the pressures even greater. There are people who make a direct link between the expansion of UCAR's activities, and the decline in NCAR's budget fortune. I personally don't happen to believe that there is a cause and effect relationship there. We never would told in the good days that UCAR had anything to do with the increasing budgets, and I would believe that that probably was also correct. there's a...one of the amusing parts of this for me, has been to listen to the universities make to us the same complaint on behalf

of NCAR. If you, UCAR, are doing all these other things, then you're not paying proper attention to NCAR. And it's the same set of universities who have complained also, that NCAR competes with them too strongly. And so, you get from having watched as long as I have, and you have this whole thing, the process for the past thirty years, nothing is ever settled for sure, final, and the same people will shift there complaints in a cyclical way in another five or six years.

Droessler: Do you think they are setting the stage for another evaluation of the UCAR management activities?

Crowe: Well, if it's not being set by these events, the time when it will happen is upon the renewal of the next cooperative agreement with NSF for the management and operation of NCAR, that is a natural juncture point for the community.

Droessler: Those are five year events?

Crowe: These have been every five years with one exception where we had a one year extension. But for the first time, the last cooper...we moved from a contract to a cooperative agreement because it is more expressive of the relationship we have with the National Science Foundation. but for the first time, three years ago when the last one was entered into, UCAR had to submit, well not the first time, back in '59 you guys submitted a proposal, but we has to submit a proposal to the National Science Foundation. We, UCAR, to continue the management and operation of NCAR. And that was heavily reviewed by the NSF. Eighteen anonymous reviews, the advisory command for atmospheric sciences sat as a panel and did a review, the National Science Board sent a site visit team out here, their budget team, headed by Mary Good who is now chairwoman of the National Science Board. Before recommendations went forward to the National Science Board whether or not to continue the cooperative agreement with UCAR for the management and operation of NCAR, that was a sole source submission. But we're now hearing from the National Science Foundation that the next one is going to be competed. And the next one is a year and a half from now. And if in fact that is a genuine statement, we've not been told it officially, but if in fact NSF chooses either because they feel they have to because of federal procurement regulations or because they want to compete the next cooperative agreement, then we'll be in a very interesting condition, where certainly the management will be examined fairly, I don't mean individuals necessarily, but the system will be examined fairly heavily.

Droessler: Harriet, I'd like you to comment on each of the presidents in turn, since you've been sitting here in the UCAR corporation office and have worked for all of them. Begin with Walt Roberts and then we'll move on to Francis Brotherton and the others.

Crowe: Fine. I really regard myself as very fortunate Earl, to have in fact worked for each of the presidents since NCAR's and UCAR's inception. We've talked a lot about Walt already, his sense of adventure, the importance of science to society and life on the globe, his willingness to experiment, his incredibly optimistic outlook on life, his intense interest always to teach. No matter who he dealt with when or where he was teaching in one way or the other, and learning at

the same time. And he imbued all of us with that kind of attitude towards the work we did, no matter what level the work was at. He had another rule of thumb which was that administration should be invisible. He didn't want to get in the way of the scientists and so we learned early what was important to the life of this place was the research that gets done and how it's used, and you don't have an administration for the sake of the administration, and I think that persists until this day. Walt was personally just as scrupulous and filled with integrity as anybody I've ever known. He was the right president at the right time in my opinion, and I think I can say fairly the same thing about each of the following ones as well. UCAR and NCAR and the National Science Foundation and the community needed someone with that vigorous and bright a view about what was possible to do, and Walt brought. He got ahead of himself, and he got ahead of the rest of the folks in the community I believe, towards the...before he retired, in a way that made people uneasy. He started moving out a little bit too fast, he had perhaps expanded a little bit too quickly, and had not been perhaps as tough as we ought to have been in terms of some of the staff there. And so the program had a soft feel to it at the time the JEC came on board. Once again, Walt did the right thing. He said, okay, my time here is the right time for me to make a change now, and let you guys have a clean slate to write on. And he went off then and did great things, as we know, did great things with the Aspen Institute, and came back as president emeritus, and made magnificent, major contributions in the past five or six years in that role. He was here every single solitary day that he wasn't traveling as president emeritus, and he contributed, as we've already said, to the establishment of the UCAR foundation, the corporate affiliates program, he was a wonderful advisor and friend.

Francis Brotherton charged in ready to clean the place off. And in no uncertain terms, I was at the meeting when the trustees hired him, and that was almost the language that they used in talking to him. Francis, we've got to get this place shaped up. shape it up Francis. And boy, was Francis the person to do that. Brilliant, energetic, would see the broadest picture of all, would see the answers immediately, his mind...

Droessler: Insightful.

Crowe: Oh, insightful, his mind worked like that (snap). What he wasn't too good at was bringing the rest of us along. He got real impatient sometimes that we didn't see it as clearly and as quickly, and so sometimes Ed Wolff and I used to laugh about being the guy at the circus parade who goes along afterward with a shovel and a broom, because God, there was Francis out there doing all these things, and they were right and they were good, and you had to just such to keep up with him and he was wonderful. He would again, a teacher and a learner at the same time, all the time, both, and he was...you could sit him down and say, Francis you got to slow down, let's talk to you about this, we don't understand what you're doing, please help us. And he would take the time to do it. He was a person with whom you could talk as directly as anybody I've ever known, and never took personal affront. He was just right. He had his own scientific credentials that backed up the rigor the trustees wanted him to bring to the quality of the programs and the place. He had the intellectual curiosity that required himself to learn about those programs before he did anything, he didn't do things, even though he was insightful and quick, he didn't do things off the hip, he made sure he understood what the program was, and he counseled with people if he

needed to talk with other experts in the field. So he helped us get consolidated and back in the good spirits with the community if you will, for bringing the program back into order.

Droessler: Both the NSF and the university members became quite satisfied with the work that was on going at NCAR during and under Francis.

Crowe: Yeah, and as I said, he undertook, he made the effort to learn the heart of the science. He was deep into it, he was smart enough to understand it, and he was not embarrassed to ask questions in any meeting if he didn't understand something. It's a great trait.

Droessler: He picked his own time to leave.

Crowe: that's right. Exactly. He picked his own time to leave. He wanted to get back to research, and the trustees hired Bob White to be the president. And that was another appointment at the right time as far as I'm concerned. Because now if you think about it, UCAR and NCAR had consolidated and gotten things back in good quality shape again, and the community was happy, and in a certain sense Bob picked up on some of the things Walt had started that were too far ahead of the time for some of the people to be comfortable with some years before. And some of the things that Francis had begun to get started, and Bob was just the right one then. He brought his sense of the national scene, the politics, his savvy on the hill, one of the hardest working people I've ever worked for and with. One of the finest writers. I've, in my job now, and over the years, done a lot of writing. It's rewarding, but it's not easy. Bob White was one of the most remarkable writers. He could sit down and write a piece that was, essentially ready to go. I mean I don't know what incubation process he went through mentally to arrive at that, but he was,

Droessler: How would he do this, ?

Crowe: You know, I didn't type the stuff for him so I don't know the answer to that. Barbara Neff was his secretary then. I think he may have dictated it, but I'm not sure about that. But he produced work himself that was, he didn't rely on staff to do a lot of that kind of work, at it was really admirable. He also reestablished for us good relations with the National Science Foundation. We has grown as we began to make noises about expanding and, under Francis' leadership, where Francis tended to be fairly, once he had arrived at an opinion, he was fairly certain of the correctness of that opinion, and his directness and aggressiveness served to alienate some of our foundation friends. He wasn't very comfortable or sympathetic, Francis wasn't with playing the politics of the game. He just didn't see the need for it. It was not anything he was very well suited for nor liked a whole lot. Bob White, on the other hand, of course was a consummate politician. And was able to help us get back closer with our sponsors at the foundation. Not everyone here was always comfortable with that because Bob, as you may remember, moved the UCAR office to Washington D.C., kept his main locale there, spent a couple of months in the summer out here in Boulder, and the rest of the time in Washington, coming out here as necessary. And there grew to be a sense here, that all the important decisions were made in Washington between Bob White and his friends at the National Science Foundation. In a way

that short cutted trustees, and short cutted some of the program people here at NCAR, and so where that overall benefitted, it had some problems as we went along as well and make jokes about, let's call up Bob and see what he and Gene have decided we're supposed to do this week. I mean it was...but anyway. Bob White was at the right time too. He moved us into this new, expanded area, arena, that I don't think Francis necessarily could have done nor Walt either because Bob knew the Washington scene. An arena he didn't know quite so well, and wasn't quite so sympathetic to, was our university friends. And this was one of the low points with us with this university relations committee we talked about before. It's telling tales out of school a little bit, but the very first meeting, and someone reminded me of this last week, a person who was on this committee, the very first meeting of that university relations committee under Bob White's tenure, was held in Washington D.C., and after about fifteen minutes at the meeting Bob said, well, I'm going to let Harriet take this over, I have a more important meeting to go to, and left with our twelve university friends sitting around the table, who didn't know Harriet Crowe from a hole in the ground, leaving me to run the meeting, and I hadn't know he was going to do it either. the committee threatened, they called him back the next day and literally threatened to resign if he didn't pay more attention to them. So he didn't move easily into that university circle, and whether all the Washington NOAA experience was too far away from that. So, the strengths overcame these problems. But we were ready then for Cliff Moreno, when he became president, when Bob had the opportunity to take on the National Academy of Engineering. the next place that needed attention, if you will, was university relations. And there came Cliff Moreno. Perfectly suited to deal, from his background, as program officer of NSF, university administrator both at St. Louis and Denver, DRI I mean, a member of the Board of Trustees, a members representative on lots of UCAR committees, former director of the atmospheric technology division of NCAR. He had every single, I think maybe uniquely so, experience in all of the places UCAR has dealt.

Droessler: He certainly did.

Crowe: And so, he came in and with an important understanding to continue the expansion of activities that Bob White had started. To solidify that, the trustees said, yes, that is the right role for UCAR, we do want to see it expanded. but as well, to try to repair the university bridges. And so early on, Cliff started a practice of making visits to the university members as often as he could and paying a lot of attention to that constituency.

Droessler: that was a priority program with him.

Crow. It was. And he did some very important work for UCAR in that regard. He got the international affiliates program started during his tenure as well. And he also, because of his ties with NSF, and his familiarity with the system there, was able to continue the good work that Bob White had started in dealing with the foundation people. Cliff, I think Cliff ran out of steam, is my personal opinion in the job, and it became time for him to move on as well, and there was no, at that point, no clarion call for the next front to be tackled, if you will. Of the same sort that Francis came in with the charge to clean up the program, Bob White to get the federal scene set, the national

business get us expanded some, Cliff, let's get the universities back into our fold and us into theirs. And all that in combination then, set a pretty good stage for Rick Anthis to become president, moving from the directorship of NCAR.

Droessler: Another first rate scientist.

Crowe: Another first rate scientist, and it's interesting if you look back at this list to see that Bob White was the first of our presidents with any traditional meteorology training at all. Walt of course, was solar physics, and Francis and his turbulence and geophysical fluid dynamics work were related, but not in the same way that Bob's background was. Cliff of course, atmospheric science. But Rick, after Francis I think, is the first president to have been a practicing scientist, and practicing faculty person. Deeply in the bowels of the university system for along time before coming here first as the director of the atmospheric analysis and prediction programs then as director of the laboratory. And Rick then brought also, reaffirmation of the trustees that yes, we think the multiple roles for UCAR are correct and we want you to continue that. We'd like to see a little bit of a harder look at what it is that UCAR does. We'd like you to talk with us president Anthis, about what the criteria are for UCAR taking on new activities. And that's an ongoing discussion these days still. But there was nothing, no major upheaval that Rick needed to correct. He is pursuing the courses set in place by the previous presidents. He took probably more advantage, I think more than any of his three predecessors, of Walt's background, history, and experience, and dedication to this place, in bringing Walt much more into the daily activities, essentially. Not operational daily activities, but planning for the foundation, planning for the corporate affiliates program, planning for fund raising, strategizing at a very high level, where Walt's experience of all those seventy years could be brought to bear in a way that previous presidents had not really exploited. So we've got ourselves a youngish president, with an incredible vigor and scientific credentials that the scientific community regards highly, and a willingness to tackle any problem open, above board, in the same way that Francis was, and Walt, and it's a good time to be in UCAR.

Droessler: Well, Harriet, thank you very much for those very pertinent comments on each of the UCAR presidents. I believe we have reached the state in this interview where we'd like to have a little summary of some biological...

Crowe: Biological??? White, Caucasian female, Earl, fifty-two years old.

Droessler: A little bit of biographical information about Harriet Crowe: I'd just like to ask you the question, who is Harriet Crowe?

Crowe: Who is Harriet Crowe? Harriet Crowe started out as Harriet Barker, born in 1938, raised in a place called Mt. Cisco, New York. I was the first member of either my father's or mother's families, to go to college. My mother's family, her father was a gandy dancer. Do you remember the gandy dancers? Named for the railroad workers who repaired the tracks. My grandfather Lochner was a gandy dancer, and my father's father had been in several businesses, all of which

had failed at one time or another, and none of, neither my father nor his four siblings, nor my mother nor her five siblings had been able to go to college. They had all graduated high school, but that was as far as they got. So, me choosing to do in high school what was called college preparatory course in those days, was regarded very highly in the family and I went off to Michigan State University in 19, when I graduated from high school in 1956, where I wanted to be, I was taking a course in preparation to study to become a nurse. I had wanted actually, to become a doctor. But the high school counselor told me that girls didn't get to be doctors, and I should be a nurse. And my family was inexperienced enough in matters of higher education to be perfectly frank, that we didn't, we believed that, we didn't know any better. And so I decided to declare that my major was going to be nursing. I also wanted to go to Cornell University and, if I think about this, it's kind of remarkable the effect, the influence a single person can have if you're naive and not sure of yourself. I wanted to go to Cornell University which had a first rate medical program and was a state school, and Miss Stafford, see I remember her name even, said no, no, no, if you go to Cornell, you'll be very miserable because your family cannot afford to buy you a raccoon coat, and everybody at Cornell has to have a raccoon coat. High school guidance counselor, right? So I went to Michigan State University, later learned in talking to the principle of the school upon a visit, that Mildred, excuse me Miss Stafford, liked to have pins on colleges on her map on the wall of where she sent high school graduates, and she didn't have one on Michigan State yet. Michigan State turned out to be a fine, fine university of course. I had one year there, and got married the summer of my freshman year and moved here to Boulder, Colorado where I went to work at the university making transcripts in the admissions and records office while my husband completed his two years of undergraduate work. We returned to New York, and spent only a few months there before Alex was accepted into the University of Colorado Law School. And it was that first '57 I mentioned earlier that I took the class with Walt Roberts when Alex was still an undergraduate here. Came back when he went to law school, and it was then that Walt hired me to work as his secretary. So, I never graduated college, I continued some courses through extension programs and at the University of Colorado. Essentially, whatever education I have has been through my association with UCAR and NCAR, and the people here. I have a sister and a brother. I have a thirty-two year old son. I was married the first time for five years, and then lived singly for almost twelve, had a chance to live in Athens, Greece for a year. If there's any fundamental connections with my interests early on and my role here at UCAR and NCAR, it has to do I guess, with that early passion for science. I loved the physics class I had in high school, I loved the, I made a clay model of the human brain as a senior science class project for example, that could be taken apart in pieces and shown. I did a report, I discovered after my mother had died in cleaning out the attic, I had a report on how important weather was that I did in the sixth grade, that I have with me at home still. So I guess I've had kind of a basic interest in science and how things work for a long time. I'm not sure who else I am. I read a lot, I do needle work, I try to be a little bit athletic, I don't know, do you have questions? I'm a little bit at loss what to say next. Neither of my parents are alive now, my son is about to get married.

Droessler: I think that based on this experience of yours, I think you were very fortunate to arrive here in Boulder and UCAR, and continue your education under Walt Roberts and all these other people,

that you've had your continuing education under including members of the Board, Henry Houghton, Horace Byers, Tom Malone and so forth.

Crowe: Absolutely.

Droessler: And in many ways that's equivalent, in my opinion, equivalent of a very high standard college diploma.

Crowe: Well, there's no two ways about it Earl. And one of the remarkable things for me since day one at NCAR is that I cannot think of a single encounter in this place, where you were treated other than for the quality and level of work you did, and there's...I don't know of any, in my dealings with all the people here, there's never been any sense of discrimination, or me being less accepted because I don't have a college degree or a Ph.D., than everybody else in the system. You know like, one of the things I do, I did sort of instinctually and then became solidified listening to Francis, if I don't know the answer to something, I don't try to fake it, not with the group of smart people around here. And no one...

Droessler: That's being smart in itself.

Crowe: In it's own way, it is. But it is the only way to learn, and this has been a wonderful, wonderful arena for me to do that in.

Droessler: I think the...there's been a recognition that you have self-educated yourself, and just the very fact you came in as a secretary and now you are a corporate officer. And I remember you were the first female to ever be the acting president.

Crowe: That's right, that's right.

Droessler: That's a remarkable point to cover.

Crowe: And the, for me the nice feel about that, not only being the first female, but was that I felt alright about being the first, I felt alright about being acting president. I mean whatever self-induced inhibitions derived from being female without a Ph.D., in a system that is largely dominated by men with Ph.D.'s, I had overcome at that point. I felt confident that I both knew enough to do what was needed, and knew enough to ask when I didn't know enough at that point.

Droessler: Well, I stressed a little, the fact that you are a female, and then I did it for a purpose, because I feel you really are a very good role model you see, for the young women around here in NCAR and UCAR, and in the Boulder area. Someone to look up to, and someone to aspire for that kind of a position that you've been able to accomplish during your lifetime.

Crowe: Well, that's nice of you to say, you reminded me of another Walter Roberts story, maybe this is a good note to close on since it's where we started. When I, I described to you that Walter hired

me without any, when I didn't have any typing experience at all. No typing classes, because I had this college preparatory class in high school. You didn't take typing if you were going to go to college. When I was the first, the first significant promotion that I had, was as director of the budget and planning office of NCAR several years ago, and that was the, the then public information officer wanted to have a story about that in the newspaper, but there was a general rule that only director level appointments were written about, press releases were done. And so this lady being creative, got a friend of hers who was a female writer on the local paper to come up and do a feature story and an interview with a successful woman story. And I told the Walt Roberts story, hiring me when I had no typing. The personnel office went crazy. They called me up a couple weeks later and said Harriet, we can't tell you how many people have called us up and said, I want to do what Harriet Crowe did. I don't have any typing, but I... So it has its advantages and disadvantages as well.

Droessler: Well, thank you very, very much.

Crowe: Thank you Earl, it's been fun.

Droessler: thank you for inviting me to listen and share these experiences, in your perspective on the work that you've accomplished here at UCAR, and for your comments on the early life here in the corporation, the center, and the developments of the corporation, the center, as they proceeded through the last thirty years. I appreciate very much this opportunity, and thank you very much.

Crowe: Well, it's been my pleasure. Our association goes back to those early thirty years.

Droessler: this is Earl Droessler and we're concluding the interview with Harriet Crowe on Wednesday, the 27th of June 1990.

END OF INTERVIEW