

American Meteorological Society  
University Corporation for Atmospheric Research

TAPE RECORDED INTERVIEW PROJECT

Interview of Horace Byers  
3 August 1987

Interviewer: Earl Droessler

Droessler: I am interviewing Mr. Horace Byers at his home in Montecito, California, on Monday, August 3, 1987. Good morning, Horace, nice to see you and today we'll talk about UCAR/NCAR, its early development, its accomplishments, how it was established, and who were the principal people involved in the establishment of this great atmospheric sciences organization.

Byers: Well, I'm not sure I can recall all the details that you were talking about, but I would like to start out with the concept of UCAR, which came about through a Committee on Atmospheric Sciences, which was formed and worked under the National Academy of Sciences. This committee was not a committee of the National Research Council, which most of the committees are in the Academy, but it was a committee directly of the National Academy of Sciences, which was a little unusual. It was called the Committee on Atmospheric Sciences, I believe. Now there is a Board on the Atmospheric Sciences in the National Academy, which, probably if it existed today, this would have been called the Board.

Droessler: Was this committee called the Berkner Committee, and was it established under--

Byers: It was under the chairmanship of Lloyd Berkner, and I recall that when it was being organized, F. W. Reichelderfer--at that time Chief of the Weather Bureau and NOAA--thought and expressed to me the thought that it would be organized similar to the Committee on the Weather Bureau, that was also formed in the National Academy of Sciences in about 1934 or 1935, which I believe was chaired by Robert A. Millikan, which had a great effect on changing the direction of the Weather Bureau. It brought in Reichelderfer and Rossby as Assistant Chief, and so on. And he thought that this would be a thing that the Weather Bureau could rely upon to develop its work and its research. It turned out that under the chairmanship of Lloyd [Berkner] it was anything but the Weather Bureau committee, and I remember Reichelderfer very soon found that out. Lloyd

Berkner, as you may remember, was a very forceful person. He had already organized this Geophysics Center in Dallas, which later became part of the University of Texas at Dallas. A great development: I believe it was supported by Cecil Green as well as by the various government agencies. I can't remember--I was trying for the life of me to remember who the members of that committee were--

Droessler: We could look that up later on...

Byers: ...There were no meteorologists particularly on [the committee]. There were people on the fringes of meteorology, such as Whipple, the astronomer--Fred Whipple, and possibly Friedman of NRL--I'm not sure. I think representing the Weather Bureau, Wexler might have sat in on some of the early meetings. But the important thing I wanted to say is that it was not anything for the Weather Bureau because Lloyd Berkner immediately directed all the attention to the universities.

Droessler: A few days ago, Horace, when I was talking to Paul Klopsteg, he recalled for me that this committee was first known as a "Committee on Meteorology." And then, at his suggestion, it became the "Committee on Atmospheric Sciences," and at that time, the National Science Foundation provided 50% of the support for the activities of the committee. Paul then became the representative to the committee from the National Science Foundation. Now this of course would bring in behind the Berkner Committee, you know, the interests of Waterman and Klopsteg, and then the program that I was just beginning in the National Science Foundation called the "Atmospheric Sciences Program."

Byers: Yes, well, I recall that now and I'm glad you mentioned it. Anyway, from his experience from the formation of this center in Dallas, and also the NSF experience in the formation of AURA--Associated Universities for Research in Astronomy--who eventually built the Kitt Peak Observatory in Tucson and so on--Lloyd Berkner was thought that what was needed in meteorology or the atmospheric sciences was a similar associated universities with a big research center. This really took me by surprise, and it seemed like a very ambitious thing. In the first place, you wonder, "Well, why do you need a thing like this?" After all, we at the universities were handling some pretty big projects at MIT, at Chicago and UCLA, in particular, and possibly at other universities. I had misgivings about it, frankly.

Droessler: Those were very interesting times, I'm sure, because the idea of having a national center associated with but not part of any one particular university [and] at the same time managed by a university consortium, was a visionary idea that needed to have a lot of discussions and consensus. Because we

only had, as I remember, about twelve universities offering the PhD programs in meteorology/atmospheric sciences.

Byers: Yes, and many of them were not deeply in it; of those universities, I would imagine that not more than half a dozen had full programs or were not emphasizing fringe parts of meteorology. But anyway, the committee voted for it, so I think, if I remember correctly, the first thing I did was contact Henry Houghton to see what he thought of the idea. I knew that we could never get the thing going without the support of both MIT and Chicago and eventually, UCLA--in other words, the earlier institutions with experience and reputations in the field. Henry expressed some of the same doubts that I had, but we decided to have a meeting. I'll be darned if I can recall when, where and how this meeting took place. But we got together with Henry and myself, and I can't remember who else.

Droessler: --Church? Someone from Penn State?

Byers: I don't know. We talked about it in a very preliminary way, and we decided to take the idea to our university administrations and see what they thought of it. Well, my duty then was to talk it over then with the people at the University of Chicago and I found that there was a slight mistrust of Lloyd Berkner existing amongst the physicists and others at the University of Chicago, which kind of retarded the thing a little bit, could have retarded it in my mind, but finally we had at the University of Chicago a business manager, I believe was his title at the time, William B. Harrell. He thought, well, if we really want it, we might do it. I mentioned to him particularly Henry Houghton and MIT and I believe he must have gotten in touch with the administrative representative of MIT on the telephone, because when we agreed to take this up and so forth, it was quite apparent that Chicago and MIT were going to take the leadership, had to take the leadership, at least that's what the other university people...suggested. So the net result was that it was decided to go ahead with it.

Droessler: The business manager at MIT may have been Carl Floe...It may be that the next step that you took--correct me if I'm wrong--was after you had some backing from the university administration, was the establishment of a "University Committee on Atmospheric Research" to explore, search out the idea.

Byers: ...Anyway, the exploration of it did take place and we decided to establish it.

The next problem was who we could get to run the show and where it

would be: two problems, really. We thought of several people, but it seemed to boil down to the fact that we ought to get the fellow out at the University of Iowa in the high atmosphere who discovered this ionized layer--

Droessler: Jim Van Allen.

Byers: Yes. Since I was near Iowa, it was my duty to go out and interview Jim Van Allen, and he was interested and we even thought that if Jim wanted the job, we could establish it at his home town--Clinton, Iowa, I believe, or anywhere around there.

The other person I interviewed was Friedman, Herb Friedman, at NRL. I remember I met him at the Cosmos Club in Washington and we talked it over. He was interested, but I found out from both of them within days or a week or so that neither of them would be interested and I couldn't convince them that they should be. Then we thought of the possibility of Walter Orr Roberts, and there we found a fellow who was so interested in it that we kind of felt that we ought to hold him back. The reason that we were hesitant about Walt, if you don't mind my saying so, was that he had a vision of it as being associated with and being a part of the High Altitude Observatory, which he had there at Boulder. Strangely enough, our misgivings turned out to be justified in part because I remember that (I'm getting ahead of the story)--I might say that at the, I think it was the first annual anniversary of the foundation of UCAR, we had a luncheon, a big to-do in Boulder and Walt, who was then in the position as head of UCAR gave a speech in which he stated and I would say completely erroneously that UCAR was a development out of the High Altitude Observatory. He didn't mention anything about where it came from, it was just "High Altitude Observatory." So his thinking was not in accord with what we were doing. But anyway, going back in the chronology, we did finally agree that we would recommend him for the job and it was contingent about it's being established in Boulder. That was his contingency that he imposed on us.

Droessler: Do you remember whether or not Tom Malone was offered the job or [was] felt out by someone to be the director of NCAR and the president of UCAR?

Byers: That might have been, and if that was so, it was probably Henry Houghton who talked to him. It's just possible. Yes, I think that was considered.

Droessler: Well, he would be perhaps the logical one because he and Roscoe Braham

from the University of Chicago and others developed the arguments for a national center in a fuller way and remember that was published then as the so-called "Blue Book." A kind of a general theme and then an outline of what a national center would look like under the atmospheric sciences banner.

Byers: ...I remember the Blue Book...

Droessler: That was a very useful book from time to time because we could go back. I remember, as trustees, you would go back from time to time and look at the outline of the Blue Book and that was kind of a goal-setting book from which you could make some judgements as to the progress that was being made on the National Center.

You were probably a member of the Board of Trustees of UCAR from the beginning, probably a charter member.

Byers: Yes. That's right, the University of Chicago was a charter member and I was the representative of the University of Chicago, and Bill Harrell, who I mentioned earlier, was the administrative representative. The Board was constituted of two representatives from each institution, the meteorological representative and the business administration representative.

Droessler: As you look over the early history of the UCAR and its trustee activity, would you think that was perhaps a rather wise decision, to have both the administrators and the scientists?

Byers: It was extremely wise, because the people who could really push and commit the university were the administrative representatives. I think that Bill Harrell and Carl Floe were the two leading ones who felt that we should go ahead with it. I think the other universities also then felt that if Chicago and MIT are behind it, then they would like to go along with it, too. At least that's the way the administrative people felt. I gather that from the comments they made and the discussions we had.

Another very useful person was Warfield of Johns Hopkins. He was vice-president or something, for administration. In the early days, he and Harrell and Floe were very prominent in getting the thing going and talking about it.

Later on, the University of California administration was involved and the University of Washington rarely heavily. The University of California was an odd situation in a way because the representative was not from UCLA, the administrative representative, but from Berkeley.

Droessler: The University System headquarters.

Byers: I can't remember his name. Max--anyway, he was very forceful, too, later on, not in the very beginning. And of course others--the Penn State group was also very much involved. As a matter of fact, the Board got a State College of Pennsylvania attorney (whose name I don't recall) to draw up the by-laws and incorporate the thing, and everything else. A very nice young fellow, I enjoyed him very much, but that's another name I can't recall.

Droessler: Did you always meet in Boulder, or did you meet on the various campuses of the university membership?

Byers: We met in various places. Of course, before the thing was really established, before the building was built or anything in Boulder, I remember particularly one of the meetings that we had at the University of Arizona, which was held in the solar-heated and -cooled research building that they had. It was in the middle of summer or sometime when it was quite warm and they had it air-conditioned by means of the water evaporation system through a channel. It was quite a novel idea. Where else we met I can't recall...

Droessler: After you hired Walter Orr Roberts as the director of NCAR and the president of UCAR, how soon after that do you remember that the Board started to take up the questions of the building and the hiring of an architect to design the building at Boulder?

Byers: I think Walter Roberts was taken on as director, later as president, and I believe the selection of the architect was done by a committee mostly of the administrative representatives, and it was under that committee that they investigated various architectural plans. I remember a representative of the College of Architecture at UC Berkeley was very prominent on that committee of selection of an architect, because he was a man for whom everybody had a great deal of respect. He was the one who knew about the construction of buildings in what he called "the local vernacular"--in other words, various practical things like that, and the decision was made, as you know, to have I.M. Pei design something that would be in keeping with the background of the Mesa on which Walter Orr Roberts had recommended the building be built. I can't recall the details of the acquisition of that land, but there was some gift possibilities--I don't remember how that was made possible, but this was all done in Denver.

Droessler: Looking back on the history and accomplishments of NCAR, do you feel that the trustees made a good choice in locating the Center somewhere near

the center of the United States at Boulder?

Byers: Yes. I, from the very beginning, thought that it should not be on either coast or in the Deep South and it was fortunate that Boulder was reasonable in that respect.

Droessler: Now you were chairman of the Trustees; perhaps you followed Henry Houghton...?

Byers: Yes, Henry Houghton was the first president and I was the second one. Then, of course as we got going, there was a lot of strength from the various universities. John Calhoun from Texas A & M, for example, as the administrative representative...

Droessler: What do you think were some of the early accomplishments of NCAR that provided the necessary impetus to keep it going, to keep the contract going from the federal government, from the National Science Foundation, and for expanding and increasing the financial commitment of the federal government?

Byers: One of the things that got going fairly soon and was well-supported was the high balloon activity under Vincent Lally, in which we established at Palestine [Pal-eh-steen], Texas, a facility for launching the new Mylar-type balloons. We did some flights for some solar observations by a fellow in the East; I think his name was Schmidt or something like that. [?Martin Schwartzchild--ed.] It was supported by NSF when you were around there. But this was quite a successful thing, one of the very first things, and really Walter Orr Roberts' idea.

Droessler: It provided some visibility for the activities of the Center.

Byers: That's right, and some good financial support.

We got some of the early leaders in the research: Phil Thompson in theoretical studies...

Droessler: Let me ask you a question along that line because you may recall that the universities were somewhat anxious about the opportunity for the National Center to take most all of the stars in meteorology from the university and bring them to Boulder. I believe that early in the activities of UCAR that there was an agreement between the universities managing UCAR that no more than one of the professors from each of the campus[es] would be offered a position at UCAR to see how things would develop at the Center.

Byers: I don't recall that, and I kind of doubt it. It may have happened. If it did, it might have been later, after my regime. One thing that did happen: at first, I think there were twelve universities and they were the ones who were on the board of directors. One meeting that we had, I think, while I was still president, we had some representatives of other universities. And one of the universities was the University of Utah, and they were not represented on the board of directors. The famous physical chemist from the University of Utah, the one who had done some work on particle physics related to weather modification...he came and he was a member of the National Academy of Sciences, a very well-known chemist. I'll think of his name in a few minutes...he made a very strong plea to open up the board of directors to other universities, that this was crazy, having an elite board when you were supposed to have representatives from all the other universities. And so there was a little discussion of it and so we voted to admit any university who applied who had a graduate degree, or maybe it was PhD's, in any subject relating to the atmosphere--high, low, whatever. So that made a big change, and suddenly the directorship were enlarged to include a great many universities, some of whom we hadn't even thought of as having had at least what we'd call meteorological activities. The University of Utah was one of them.

Droessler: I think that was a considerable accomplishment of your chairmanship of UCAR to direct the debate for enlarging the membership of the corporation. Because today, it consists of over 60 university centers including some in Mexico and Canada. That's a considerable strength, reaching out to all those campuses in supporting the concept of this National Center.

Byers: Yes, I think to get to the sort of "behind-the curtain", backstage feelings, we realized that the thing might be opposed in the peer reviews or something by universities who might have thought they were left out, and it might have created unfriendly feelings if we didn't loosen up and not leave it as a perfectly elite organization. I think it was a good idea.

Droessler: You stayed with the Trustees for a good long time...

Byers: I was the representative on the Board from the University of Chicago until I left the University and moved to Texas A & M as dean there. And of course that automatically took me off the Board, because the Board was based on representatives of universities, not individuals at all.

Droessler: Did you go back to the Board then as the second representative from Texas A & M?



Byers: No, as dean there, and later vice-president, I wanted other people from Texas A & M, other than myself, to be represented. I didn't think that it was appropriate for me to be representative. I think Werner Baum who had something to do with it, told me that I was no longer on the Board and I agreed and that was the way it worked.

Droessler: Another important development at NCAR was the establishment of the computer facility that would serve the universities. Was that something that was gotten underway rather early...?

Byers: Yes, it was, and it was housed in this temporary building that we had there. It was a big computer and I remember we were concerned with which computer we would get and we decided, finally, on the big CDC computer, which was one of the most advanced computers on the market. Of course, it was a huge thing, a giant really, and it was housed in a large air-conditioned room there. It later moved to our building, when it was completed.

I'd like to emphasize that the idea of the formation of UCAR was met with skepticism, like many things that happened in science. Something big like that, my gosh, people thought, gee, is Lloyd Berkner out of his mind? Are you fellows doing something crazy? After all, universities are pretty well supported in meteorology and so on, and it was a little difficult to have the right kind of arguments. I think, like anything great, it never gets off to a roaring start. As soon as the idea is suggested, it has to go through the mill of criticism and what you might call popular opinion, something like that. I suppose the same thing happens in all great endeavors. It sure happened there. It was interesting to reflect on the days when we were first working with an idea and trying to put it across.

Droessler: We had some splendid leadership for the atmospheric sciences at the time, including the meteorologists who were throughout the country, especially at the universities, and then we added to that group a physicist and others who were finding the atmosphere as an environment in which to explore some of the things they were interested in. Nuclear physicists, the Van Allen radiation physicists, and so forth--

Byers: Johnny von Neumann, at Princeton, for example.

Droessler: What do you remember about him?

Byers: I had very little contact with von Neumann. Rossby worked with him closely and of course, Jule Charney, who was there, and it was Jule Charney and I guess Phil Thompson and some others who associated with

Johnny von Neumann made it easy for Johnny to make the decision that meteorology was a very logical application of the computer. In other words, we were just overburdened with non-linear, partial differential equations, and that was meat for von Neumann. He had written, you know, a book published must have been in the late 20's on the theory of games, so he was naturally a person to get himself interested in the game of weather forecasting and so on and so it was largely through von Neumann's influence, I think, that the Air Force and the Weather Bureau, NOAA--

[BRIEF INTERRUPTION.]

Droessler: That was a marvelous contribution that the Princeton campus made, wasn't it? They had John von Neumann, a beginning computer competence, and we had the problem of the atmospheric sciences.

Byers: I remember particularly they used the ENIAC computer at Aberdeen Proving Grounds (Maryland). It was great. I never got myself involved because Rossby was very deep in it, and Jule Charney and Phil Thompson.

Droessler: What strengths did the University of Chicago bring to NCAR/UCAR?

Byers: By the time UCAR got going, I think Roscoe Braham and I were pretty deeply involved in cloud physics. We had quite a bit to say and to do about getting cloud physics going. Of course, Jim Lodge went there to NCAR--

Droessler: For atmospheric chemistry.

Byers: Yes, atmospheric chemistry--and, of course, Chester Newton ended up there and I think other things went on. We made use of the UCAR Flight Facility in some ways, although we already had our own flight system in Chicago. But I actually used it when I was at Texas A & M, to study cumulus clouds in the early stages before precipitation, or at the time of precipitation. Anyway, we advised them quite a bit on the aircraft facility which was developed there.

Droessler: That has become a major strength of NCAR, too. The Field Support Facilities, including the aircraft facilities.

Byers: --which has helped the universities quite a bit. Yes, we had a lot of suggestions there. Roscoe Braham was on their committee and what not.

After I left the Board [of Trustees], I know there was quite a lot of re-thinking of UCAR, which I was very glad to see, to bring the universities

more into the picture and so on. I think this was instigated by NSF, which was, of course, supporting it.

I suppose we've talked about everything. I think I recall very distinctly your saying to me, "Once you get that building there, it will have to be supported and will be supported very effectively. Do you remember saying that to me?"

Droessler: No, I didn't, but I'm glad I said to you.

Byers: That building was really a great thing. I think I. M. Pei did a beautiful job on the design of that building.

Droessler: It appears to be very functional, too.

Byers: It was functional and I remember that we had some very interesting discussions on the question of each scientist having his own little private room, his own little dukedom, as we called it, versus having work areas. For example, from my point of view, working with large groups in cloud physics, I wanted to have sort of an area-type allocation of space, whereas the theoreticians wanted to be locked up in private rooms, where they wouldn't have to be bothered with anybody unless they knocked on the door, and that sort of thing. Well, I think it turned out to be sort of a compromise. We gave some people their private dukedoms and in other cases, it was a work area. I can't recall just how effectively that came about; I imagine partitions have been put up and taken down since that time, but that's the way things go and I've always found that I could work more effectively in a work area and I think that was the reason we were successful at Chicago. I remember at Texas A & M, when we built the new geosciences building, I insisted that we organize it on the basis of work areas rather than having so-and-so's office here with a locked door or whatever, somebody somewhere else. I found then, as I did at UCAR, that different scientists have different approaches and different desires, and I wanted to work with a lot of people around me to exchange views. I didn't want to be locked up in a private cell, so that's an interesting thing about the science that has never been discussed very much in general discussions about of scientists work. And since I've been involved in space allocations very deeply, it has been something that has been brought to my attention very prominently as I've gone along. I wonder if you've ever thought of that or seen it in operation, or without operation.

Droessler: Well, I think I agree with you that one has to have a lot of regard for the desires of the individual scientist; as you've mentioned, some of them like to operate more or less individually and others operate more effectively as

part of a group or as a leader of a group. We just must allow for that kind of flexibility as we design and re-design and modify and re-modify our scientific spaces.

We talked a bit about the contributions of the universities towards the development of NCAR. And certainly without these contributions, NCAR would not be what it was today. Have you reflected on what the development at Boulder has meant to the university community, the reverse side of that coin? How has NCAR/UCAR helped the universities to grow and to become higher quality organizations in the atmospheric sciences?

**END OF TAPE 1, SIDE 1**  
[continued on Tape 2, Side 1]

## Interview with Horace Byers

### TAPE 2, SIDE 1

Droessler: I'm talking with Dr. Horace Byers, a past President of the American Meteorological Society, and we're meeting together in Montecito, California, on Monday, August 3, 1987. I would like to explore with Horace some of the early developments in meteorology in his career and some of the highlights of his remembrance of the presidency of the AMS and the development of that great organization.

Horace, why don't you begin by telling us about your first visit to MIT and why you were there, how did you come to go to MIT?

Byers: Well, I was at the University of California, where I was the important person of "meteorological observer" at \$25.00 per month for taking observations, when I received a phone call from a fellow by the name of Rossby who was in town and who was with the Daniel Guggenheim Fund for the Promotion of Aeronautics and wanted someone to help him with an experimental airway weather service operating between San Francisco and Los Angeles. I was interviewed by him at the old hotel in San Francisco and by his very persuasive arguments, I agreed to go with him and take on this job. I still had a year to go at UC-Berkeley, but I worked evenings and part-time and so on with him, later the Weather Bureau, which took over the thing. And then, the following year I received a Daniel Guggenheim Fellowship to go to MIT to study under Rossby. I went there in September, 1929. This was the beginning of the second year of Rossby and Willett at MIT. When I arrived, Rossby was out of town, but Hurd Willett had just arrived back from his vacation and I met him in his office for the first time.

With reference to the American Meteorological Society, I should say that Willett was busy opening his mail, having just come back from vacation and when he came to the **Bulletin of the American Meteorological Society**, without even opening it, he tossed it into the waste basket. That was my introduction to MIT.

Droessler: And to the American Meteorological Society.

Byers: I was already a member of the American Meteorological Society. I joined it in Oakland in 1928, I believe it was, and I had similar feelings about the **Bulletin**, which at that time was merely a collection of trivia, and newspaper clippings and that sort of thing.

We had a class at MIT which consisted of Captain Orville, Lt. Commander William N. Lockhart, a couple of other Navy officers whose names I don't recall and a civilian, Chaim Pekeris, who, you may know, now is in Israel and became a very famous geophysicist. At that time, of course, the Weather Bureau not only felt but actually had the complete control of meteorology in the United States, although inroads were made by Rossby and others through the Guggenheim Foundation, and also the Navy was active at Annapolis with the post-graduate school and in fact, these students at MIT were junior grade lieutenants who had finished a preliminary course in weather, you might call it, at Annapolis.

As far as the American Meteorological Society was concerned, it was operated out of Blue Hill by the late Dr. Charles F. Brooks. The Weather Bureau, as I mentioned before, tried to exercise its control over meteorology and I remember that one of the things that I thought I should do in Boston was to visit the city office of the Weather Bureau, which was then located in the old Hotel Young building. I went there and was treated with extreme coolness, quite in contrast to my friendship with Major Edward Bowie of the San Francisco office. So that was my first contact with things there. I also had contact with Charles F. Brooks, who asked me to help him give a day off to the observer, an old-timer at the Blue Hill Observatory, which I did. I went over there to give this man the evening off, and much to my surprise, he didn't go off; he just sat there and talked to me the whole evening about whole times. I had to go there two or three times to give him the so-called "day off" and each time that was all I got, was a discussion. He didn't leave the place, I guess he was in love with it.

As far as the Meteorological Society is concerned, it just limped along with the **Bulletin of the AMS**, which every member got, and some of the things in it were interesting. Beginning about in the 30's, there started to appear some original meteorological publications, papers.

Droessler: It may have been at that time that Charles Brooks turned the editorship of the **Bulletin** over to Bob Stone.

Byers: No, this was before Bob Stone. S. P. Ferguson worked at Blue Hill and he published a couple of papers and then there was a man from the Smithsonian Institution, who worked on the effects of radiation on weather.

Droessler: Was it Dr. Abbott?

Byers: No, it was one of Abbott's protégés. An old fellow, I can't remember his

name...he later employed Jerry Namias at the Blue Hill Observatory, and some papers began to appear in the **Bulletin of the AMS** as a result of these three people I've mentioned.

Droessler: So slowly but surely the **Bulletin** became an avenue for publication of some papers. I suppose the only other publication available was the **Monthly Weather Review**.

Byers: The **Monthly Weather Review** contained some scientific papers, such as they were, such as the original papers of Rossby on turbulence, written when he was at the Weather Bureau on an American-Scandinavian fellowship for a couple of years before I met him.

Droessler: I believe it was about the mid-1940's when the **Journal of Meteorology** began.

Byers: Yes, it must have been in 1945, something like that. Meanwhile, the **Bulletin** had become more and more scientific. The section of meteorology of the American Geophysical Union was having growth at that time so that during the 1930's there were meteorological papers published in the **Transactions of the AGU**. So there were just beginning to be three outlets for meteorological publications: the **Monthly Weather Review**, the **Bulletin of the AMS**, and the **Transactions of the AGU**.

Droessler: Were you involved in the training of meteorologists during World War II for the Air Force and the Navy?

Byers: Yes, oh, tremendously. The University of Chicago was the biggest in that respect. By that time, of course, we're jumping now to my period at the University of Chicago, which began in 1940. So, yes, this was a very huge expansion of meteorology. One can hardly imagine it as a transition from the dullness and quiet that characterized meteorology prior to that time. The Navy was the only organization outside of the Weather Bureau which had meteorologists. Meanwhile, commercial aviation was developing and organizations such as United Airlines and Trans-World Airlines, TWA, were just beginning to employ people who called themselves "meteorologists." Some of them were former Marine Corps enlisted men or catch-as-catch-can physicists, or what not. So the industrial meteorology was just beginning to develop at Caltech under Krick, and so there was quite a growth in meteorology. The Weather Bureau, in the early 1930's, decided it needed some kind of reform, so a committee was appointed by the National Academy of Sciences to review the Weather Bureau work. And on this committee was among others, Robert S. Millikan, the chief executive officer of Caltech. It was actually chaired by a man from Johns

Hopkins University, a well-known geographer who had worked in physical geography and climatology, whose name I don't recall at the moment. And several other outstanding people. I think Carl Compton, the president of MIT, was also a member of that committee, which made recommendations to the Weather Bureau, which began sort of a revitalization of the Bureau, a development more towards its aerological work. They brought in Delbert M. Little, who had been my boss at Oakland, after Rossby left, to be the head of the Aerological Division, and there was quite a development. So, along with the development of the American Meteorological Society and its **Bulletin**, there was all kinds of exciting developments in meteorology, particularly in the area of the development of the Air Age. Remember, Lindbergh had just made his flight in 1927 and here it was 1928-29, so it was still fresh in the minds of everyone in the United States.

Droessler: How long did you stay at MIT?

Byers: I was at MIT from 1929-1932.

Droessler: Then you went to the Weather Bureau?

Byers: No, that was, as you remember, the very depths of the Depression and Rossby always felt that no one should get a doctor's degree without having first some experience in the field, in meteorology, so he arranged with the Scripps Institution of Oceanography, with Dr. T. Whelan Vaughn, who was then Director, to have me come and work there on some things in relation to the ocean currents and long-range forecasting of weather, the same sort of thing that Namias is doing now at Scripps. So I worked there for just one year, and then, needing money, I received a fine offer from TWA to be an instructor in meteorology, so I spent a year there, and then went back to MIT and studied for my doctorate, which I received in 1935. Then I went to the Weather Bureau. By this time, the committee which I mentioned a moment ago had made its recommendations and recommended that the Weather Bureau set up an Air Mass Analysis section and hire some graduates of these institutions, so they hired three of us from MIT--Stephen Lichtblau, Harry Wexler, and myself. And I was in charge of the Air Mass section. Meanwhile, Namias had been working and publishing through the American Meteorological Society his famous publication on air mass and isentropic analysis. With the publication of various meetings such as the one in Toronto in 1939, the **Bulletin** was becoming a scientific publication. It had papers by Henry Houghton on fog and condensation particles in the atmosphere, representing work that Houghton and Radford had done at MIT at their research station at Round Hill.



Droessler: So even in the 1930's, the American Meteorological Society was a valuable organization for getting people together, for scheduling technical meetings and annual meetings.

Byers: The annual meetings were becoming really significant. They had quite a number of climatological papers which were quite good, and some papers from MIT and Blue Hill, so gradually it was becoming--the beginnings of a real scientific society.

Droessler: And like the Weather Bureau and the universities, it was getting itself in a position where it could respond to the national needs that were brought on by World War II.

Byers: World War II started in Europe in 1939. This meeting of the American and Canadian Meteorological Societies was in September, 1939. And through the influence of Rossby and the Carnegie Institution, J. Bjerknes was in America and attended that meeting in September, 1939. And he was caught out of Norway just at the time the European part of the war started in September, 1939. As a matter of fact, I think we were on our way home from the Toronto meeting when the invasion of Poland occurred by Hitler's troops. So this meant a turning point in the sense that J. Bjerknes was recommended for the formation of a department of meteorology at UCLA. So all these things were happening just before Pearl Harbor, so that we were getting places. I had moved to Chicago and we together managed to get Rossby there, and the meetings of the American Meteorological Society very quickly turned out to be very significant, truly scientific meetings. The **Bulletin** publishing papers, and at the same time, another competing journal was established: the **Journal of Marine Research**, which also contained papers by Rossby and other meteorologists. So there was now one more [journal] where meteorologists could publish. Of course, in addition to various European journals, like the **Quarterly Journal of the Royal Meteorological Society** and so on. So when the war broke out, of course, meteorology grew by several quanta. This was for the needs of training people for the Army Air Forces and the Navy and in addition, the Civil Aeronautics Administration provided scholarships for students who had taken the civil aeronautics training in flight to learn meteorology, those who were so qualified, at the various universities. We started out with the Army Air Forces, the Navy, and the Civil Aeronautics Administration students, who were very few in number. I remember Verner Suomi was one of them at Chicago. And we really expanded and the American Meteorological Society became much more important.

But the big step came toward the end of the war when Rossby and several others got together and decided to make a real first class scientific society

out of the American Meteorological Society. There was all kinds of activity among an ad hoc group under Rossby to reform the American Meteorological Society. It was as a result of that that Ken Spengler, who was recently honorably discharged from the Air Forces was employed as the Executive Secretary to sort of manage this sudden quantum growth in the American Meteorological Society. Shortly thereafter, the present headquarters of the Society in its present building was established.

Droessler: Of course, with Ken in place the Society could begin to plan a broader publications policy and effort.

Byers: There were, I would say, two or three great movements: more publications, which was marked by the foundation of what was called the **Journal of Meteorology**, now the **Journal of Atmospheric Science (JAS)**. Also, with the end of World War II, it seemed that there were a great number of meteorologists who had been trained, who were interested in the possibility of employment other than in the US Weather Bureau and a great effort was made for the development of what was called industrial meteorology. Rossby took a big hand in that. I don't remember whether he was president of the Society at that time or not, but he certainly was a leader in the development of opportunities for meteorologists to start industrial services. The many industrial meteorologists that we have today were started at that time. The group in St. Louis, Los Angeles/Caltech and various places, the Santa Barbara group under Bob Elliott and Gene Bollay--all of those were started about that time. Meanwhile, of course, the publication of books and special AMS publications was put into another quantum jump. The AMS was, in fact, a first-class society, comparable to the best scientific and engineering societies in the country.

Droessler: So we move then from having meteorology the exclusive activity of the federal government to a sharing of that responsibility with a growing number of universities, and then through the American Meteorological Society in particular, the encouragement and development of private meteorology. Ken has told me that President Orville was very important and played a significant role in the encouragement of private meteorology and I believe you followed along closely after Orville as the president of AMS or maybe you preceded him.

Byers: I followed Orville and Yates. Yates was my predecessor as president. Yes, I don't think I had too much to do with that particular aspect, although I encouraged it and I wrote an article which was published in the **Bulletin**, in which I discussed the growth of private meteorology and the importance of it. So that was about the extent of my activity. But Rossby worked hard and Orville--I remember Rossby and Orville were practically

commuters between Washington and Chicago and Boston in getting this thing started. So it was really an important step.

Droessler: Do you remember some of the people you were associated with when you were the President of the AMS, some outstanding members of your Council who you worked with? For example, was Orville, Yates or Reichelderfer on the Council, or Namias?

Byers: My memory isn't good enough to tell you who the members of the Council were, but you'll find it of course in the file of the **Bulletin**. I think I remember Morey Neiburger from UCLA was one of the members, in addition to those that you mentioned. And of course one of the things that happened was that Landrigen came in--well, no, before him, Henry Ward--Henry Ward was the son of Robert Deseyo Ward, the great geographer professor at Harvard and through Ward, he became interested in meteorology. His business was not meteorology; he was with a brokerage firm called Eden and Howard in Boston. But he became the treasurer of the Society. He was a very valuable man because he brought proper business and accounting into the rapidly developing Society. Henry Ward and I became good friends there. He also was a very good friend of Spengler; between the two of them, they put the Society into a good, solid business organization. Ken Spengler worked very hard, as you know, in developing the Society, increasing the membership, and the people who had been trained in the Air Force and the Navy, many of them became members of the Society and are still members, very prominent members, some of them. So this was a great day for American meteorology and its Society, when we got things going in Boston with Ken Spengler, and Henry Ward who was succeeded by Landrigen. It's been a great operation. As a matter of fact, I have heard it said by others in scientific societies, that it is really a model of how a scientific society should be run.

Droessler: Yes, Ken has received many honors in his role as Executive Secretary and Executive Director in the association that he belongs to, the Society of Executive Directors. He's been named to their presidency and has been very much honored and worked in that area, too, to help provide that kind of leadership for scientific societies throughout the nation.

Byers: Yes, I've heard about that and read about it. He really has not only taken his position in the scientific world, but has put the American Meteorological Society itself in a top-notch situation with respect to other scientific societies.

Droessler: You served on the Council of the American Meteorological Society, and then you served on several of the committees.

Byers: I don't remember when I first became a councillor of the AMS, but it was in the old days with Charlie Brooks, probably in the 1930's sometime. I've always felt that the American Meteorological Society was home base for all meteorologists and many other people who work in the atmosphere, whether they're in high atmosphere or space or anything else.

Droessler: Did you have some involvement in the purchasing or receiving of the headquarters building?

Byers: No, I didn't have any direct relationship with it. It happened before I was president, as I recall. No, that was largely the work of Orville, Rossby and probably Don Yates and others.

Droessler: I believe Tom Malone had a--

Byers: Tom Malone, let's not forget him, he was a great driving force in the AMS. As a matter of fact, I think he sort of took things over in a way before Ken was appointed in some manner, I don't know. If you look back in the record, I think you'll find that Tom Malone was playing a key role in that.

Droessler: He was probably a young associate/assistant professor at MIT.

Byers: Yes, he was at MIT at the time, and he of course became editor of the famous publication on--

Droessler: **The Compendium--**

Byers: **The Compendium of Meteorology.**

Droessler: That was another landmark in the history of AMS, wasn't it?

Byers: That was a great landmark in the history of AMS. Tom was editor of it, and I was on the committee which helped select the various contributors or suggested the various contributors. One of the great things we did, I think, was to confine it not only to American contributors, but got contributors from various European countries to contribute who were really experts on the various subjects that were considered. That was a great undertaking that should go down in the annals of the AMS as very important.

Droessler: Also in the field of international meteorology and cooperation in meteorology in terms of communications and publications, I believe that AMS has played a major role there in dealing with the WMO. Our

publications are recognized throughout the world as having a very high standard and quality.

Byers: During my term as President, Sir Charles Normand was president of the Royal Meteorological Society, and I met him in England in one of my trips there, and we decided to have a joint meeting of the American Meteorological Society and the Royal Meteorological Society and we arranged and had that meeting in Toronto. I believe it was in 1952 or 1953...maybe 1954; it was a very successful meeting. We got the two societies in the joint meeting together.

Droessler: Well, I think AMS has been working along that line successfully throughout the years now, and have had many, many joint meetings with meteorological societies throughout the world, and it really has been very helpful too in helping other countries establish a meteorological society in their own countries.

Byers: Well, I would say that it has almost become the "World" Meteorological Society, because if you look at the various organizations and publications in countries around the world in the field of meteorology, it's quite obvious that the American Meteorological Society is the leader. Our publications, which now number half a dozen maybe and our important influence and representation in meetings in Europe, Australia, and Japan, a number of places, has made it quite obvious that the American Meteorological Society not only is in the forefront, but is the actual leader in meteorological science throughout the world. And we've had a tremendous influence, through meetings which very often are held in Europe, but with the cooperation of the American Meteorological Society with WMO and the local meteorological societies, the French in the area of cloud physics, and the Germans and Austrians in the area of radiation--joint meetings everywhere that you can imagine.

Droessler: Next January, we'll have the 68th annual meeting of the AMS, very close by to your home here in Montecito--it will be held at Anaheim, California, in the Hilton Hotel. This will be the last annual meeting that Ken Spengler will be with us as the Executive Director, and I hope that both you and I will be there at the celebration of this important event.

Byers: I would like to be there not only to meet old friends and talk meteorology, but also especially I would like to be able to honor Ken for his fine work in the development of our Society.

Droessler: Well, thank you very much, Horace. You have had a distinguished career and a varied career and a happy career and a productive career in

meteorology: in the federal government, in the universities, and as one of the leaders in the development and leadership of our American Meteorological Society, and all of us in the profession look up to you and respect you and just wish you well and admire all of the work you have done and give you our great appreciation for that work and the life that you have given to us in the service of meteorology.

Byers: Thank you for your kind words. I also want to thank you for jogging my memory at times.

Droessler: I know personally I have been very honored to follow in your footsteps and also honored to have served as a president of the American Meteorological Society. It's really one of the great honors that could come to any one of us, by way of being elected to that high office and having an opportunity to serve our profession in that role.

Byers: Well, I think the Society is or should be very appreciative of your services in every place where you have been, not only within the Society, but elsewhere. I think we owe a debt of gratitude to you.

Droessler: Thanks, Horace.

Droessler: Following the interview, Dr. Byers provided some biographical information, which is made part of this tape record.

Horace was born in Seattle, Washington on March 12, 1906. His mother was Harriet Ensminger Byers, who was an accomplished artist and pianist. His father, Charles H. Byers, was a civil engineer with the Interstate Commerce Commission in the Bureau of Evaluation in the Western District. The Byers family consisted of Horace and two brothers, Fred and Lyell, and a sister, Louise. On October 6, 1927, in Berkeley, California, Horace and Frances Byers were married, and their marriage was blessed with one child, a little girl, Henrietta, who today is Mrs. Thomas W. Bilhorn.

This completes the biographical information provided by Dr. Byers.

**END OF INTERVIEW**