# Nevada Test Site Oral History Project
## University of Nevada, Las Vegas

# Interview with Philip Allen

**July 9, 2004**
**Las Vegas, Nevada**

Interview Conducted By
Mary Palevsky

Oral history is a method of collecting historical information through recorded interviews conducted by an interviewer/researcher with an interviewee/narrator who possesses firsthand knowledge of historically significant events. The goal is to create an archive which adds relevant material to the existing historical record. Oral history recordings and transcripts are primary source material and do not represent the final, verified, or complete narrative of the events under discussion. Rather, oral history is a spoken remembrance or dialogue, reflecting the interviewee's memories, points of view and personal opinions about events in response to the interviewer's specific questions. Oral history interviews document each interviewee's personal engagement with the history in question. They are unique records, reflecting the particular meaning the interviewee draws from her/his individual life experience.

Produced by:

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**Philip Allen:** I'm Philip Allen. Everybody calls me Phil, except in the family; they used the Philip. I was born in Russell, Iowa on a farm. The date was August 3, 1918, which was the latter part of World War I. I grew up mostly on that farm, but in 1927 my father decided to go into business for himself, so he moved the family to Fairfield, Iowa until the Depression forced him back to the farm in 1930. His choice of place, I think, was because that's the town where my brother was going to school, to college. I have two brothers and one sister. That brother, Hubert, majored in physics, and after he finished college at Parsons College at Fairfield, he went to graduate school at the University of Maine, and from there to MIT [Massachusetts Institute of Technology] and worked on his Ph.D. in physics. My other brother, Roger, a few years later, went to Parsons College, graduated, and he too went to Maine, then to Penn State to work on his Ph.D. in physics. But he had married when he was in Maine and he had a child after he'd started working on his Ph.D., and decided he needed more money, so he went into the Weather Bureau and worked in Washington, D.C., and was transferred to MIT and worked at MIT for a while. I mention all of that because it aroused my interest in physics, and looking back over my life, I think I have always been interested in physical things. I've been interested in why things are the way they are, why they work the way they work, and I think that sort of tailored what I ended up doing.

**Mary Palevsky***: How much older were your brothers? These are both your older brothers.*

They're both older brothers. Well, it starts with my sister, who was the first in the family. She was born in 1902.

*Her name is?*

Elizabeth. And she became a nurse, registered nurse, and went to California. She went to California about the same time that my father moved from the farm into Fairfield, Iowa. My brother Hubert was born in 1906, and he's still living; he'll be ninety-eight this year. My brother Roger, who went into meteorology, had problems with his heart and he died a couple years ago, just short of ninety.

*And it's interesting, too, was there something in your parents' wishes for you that you all went into these kinds of—sort of scientific professions? Even nursing is quite a profession in—*

Yes, I think so. My father grew up on a farm. *His* father had homesteaded in Iowa back in 1856. But my father was one of twelve children, and only a couple of them ever went to college, and my dad was one of them. And he went to Highland Park College in Des Moines, Iowa and majored in physics, and he taught high school in Iowa for a couple years until his father asked **[00:05:00]** him to come back and take over the farm. All the rest of the kids had developed their own farms or professions and his father needed him to take over the farm. So Dad became a farmer the rest of his life. But I think he always sort of regretted the fact that he had not made more of his education. So he encouraged us kids all to go to college, even in my case. I graduated from high school in 1936, which was after several years of the Depression, and he did not have the money to send me to college. But when I expressed an interest in going to college, my maiden aunt, who had taught school in Chicago for many years and never married, she was able to finance my college education. And I worked in college, in the physics department, as an assistant to the professor.

*And this is where?*

At Parsons College in Fairfield, Iowa. It was a Presbyterian school, and my parents were very strong Presbyterians. The whole family had been.

*Now, I was going to ask you about your religious background, and what does that mean, to say you're a strong Presbyterian?*

Strong in the sense that my father was an elder in his church. He started off in a little country church that was only a couple of miles from our house. Was an elder there, and then moved to the nearby town, where he became a member of the session for many years. I think he probably was on the session, all told, something like twenty-five years. And my mother taught church school. And we kids got a strong dose of religion because my parents held a devotion every single morning of their lives, of their married lives, before breakfast. That is interesting to me because my interest in religion caused me to change my beliefs drastically over a period of decades.

*Well, we'll get to that, but just for clarification, if they held a devotion, they would read—tell me what that would be.*

Dad would read several verses from the Bible. I want to say a chapter, but I don't think he read a full chapter every morning. And then we would kneel beside our chairs and have prayer, which would be a long prayer. But that would be the extent of it. Other than that, *nothing* was ever said about religion in our family.

*That's* so *interesting.*

It was all said in church or in the devotions.

Getting back to—I graduated from high school in 1936, and there was never any question about which college I would attend. I went to Parsons and majored in physics. I started out majoring in chemistry, but decided that was not my thing and I switched to physics. **[00:10:00]** At the end of my college career—this was 1940—opportunities were not very great for me. In those days, nobody ever came to the college looking for employees. We all were on our own, and I didn't know anything better to do. I couldn't think of any company to write to. I did what most of the other graduates that year did, in 1940. I went out looking for a place where I could teach in high school. I actually got a job, but I had applied for a graduate assistantship at three universities, and after I had signed a contract for a teaching job, I was accepted at one of those universities, so I paid the penalty and cancelled my teaching contract and went to the university, which was Iowa State. In those days, it was Iowa State College; now it's University. And of course, I studied physics, which brings me to a story in itself. As an assistant in the physics department, I helped with the laboratory instruction, and one of my supervisors was a gentleman named John Atanasoff. John was one of these people who always went around sort of in a daze because he was always thinking. He had a table in his office that was covered with all kinds of electronic, or electric, gadgets. In those days, we didn't use the term "electronics" much. Many years later, like in the 1980s, I saw an article in the paper that the Smithsonian Institute had declared that John Atanasoff was the *true* inventor of the electronic computer, because one of those gadgets on his table was a gadget that added and subtracted and [laughter] I don't know what all else.

Anyway, the physics at the university level was a little more difficult for me. In the small college, I was the only physics major in my class, so my classes were very small and they were pretty much what I wanted to do. When I got to college, I had a lot more competition and I

wasn't entirely prepared for that. So along toward the latter part of that first year at Iowa State, I began noticing things on the bulletin board about other opportunities. One was an opportunity to take an examination to go into the Weather Bureau. I took the exam, and a week or so later, another bulletin showed up on the bulletin board, looking for people who had a background in science who would like training in meteorology at one of several universities. That also sounded interesting, and I applied for that. The bulletin was put out by the Air Corps, Army Air Corps.

*And what year is this, now?*

That was in 1941.

*But it's* before *Pearl Harbor, still.*

Nobody knew anything about Pearl Harbor. We were not preparing for war, but the country had **[00:15:00]** started the draft and I had a fairly early number, not too early, but fairly early number in the draft and was not sure whether I would be allowed to stay in school. So when the Air Corps presented this opportunity to become a meteorologist *in* the Air Corps, I decided it was worth trying for. I applied and was accepted, and in June of that year I reported for duty at the University of Chicago for training in meteorology. I became an Air Corps cadet, so I had to go to Fort Des Moines and go through the process of becoming a soldier, and was immediately put on a train to go to Chicago.

At Chicago, I was a member of a class of twenty-two military cadets. Actually, it was the second class that the Air Corps had started, training weather officers. The first class had graduated in the spring of 1941, and a few of them stayed on to help teach the second class, which was my class. There was also a group of CAA, Civilian Aeronautics Administration, students taking meteorology, and three or four other civilians, that made up our class. The work was mostly graduate level work, learning the dynamics of the atmosphere, the scientific causes

and sequence of all weather phenomena, such as wind, clouds, rain, thunderstorms, fog, and how to measure and predict them.

And in December, of course, Pearl Harbor occurred. And I learned about Pearl Harbor at a time when I was visiting my aunt, who lived out on the edge of Chicago. I'd gone out there on Sunday for dinner, and over the radio, when we were sitting down to dinner, we heard about Pearl Harbor having occurred, and almost immediately there was a request for everybody that was in service to report to their headquarters. So I ate dinner and quickly got on the elevated [train] to go back to the University of Chicago. The only way that that affected me right then was that my course was shortened from nine months to something like seven months, and I finished in February. I think it was February 14, 1942.

It was while I was at the University of Chicago that I met Dr. [Arthur Holly] Compton who was the Nobel laureate.

My first assignment after graduating from meteorology school was a month of military training at Selfridge [Air National Guard] Field.

*Selfridge Field. That's in Chicago?*

Which is outside of Detroit. From there, the first thing I did once I was relieved was to stop at a used car agency and buy a car. Then two other fellows and I drove to our assignments in southern **[00:20:00]** Texas, our first military assignments. For the other two fellows, it was outside of Dallas, and outside of—well, at Mission Field, which was on the Rio Grande River down near Brownsville.

I was assigned to Harlingen Army Air Gunnery School, which is at Harlingen, Texas, which also was outside of Brownsville. I was in charge. I was the commanding officer of a unit of twenty-some technicians and one other trained forecaster, and the two of us made forecasts for

the gunnery school, which was new, as it had only been in existence for a couple of months, through that summer.

*Now, just because I have very little knowledge of the world of meteorology and weather prediction and stuff like this, you're at a gunnery school; what's the purpose of the predictive function that you're doing?*

OK. The gunnery students were pilots who were using P-6s at that time to fly over targets and practice gunnery, practice using the guns that were mounted permanently on the aircraft. The target area was over Padre Island, which goes up and down along the Texas coast there. Sometimes the weather would be cloudy, in which case they couldn't practice, or foggy, or the wind would be too strong from the wrong direction. I'll always remember one day when we had told them that everything would be nice for that day, but the wind came up from the southeast and kept getting stronger and stronger and stronger, and we had no clue whatever why that was occurring. I got on the phone and talked to my friend, who was Fred White, who was at Mission, Texas, just fifty miles away, and he said the same thing was happening there and he had no explanation for it. There actually was a little damage at the airfield. A couple of airplanes were tipped over by the strong winds. And I had to explain all this to the CO [commanding officer], but was never, ever able to explain satisfactorily, even to myself, why this occurred.

I was there from around a little before April 1, 1942 until the end of August 1942. During August, both Fred White, my friend, and I were given orders to return to the University of Chicago to teach. And we did that. We found in our absence that the university had changed considerably. We no longer were having meteorology classes in the physics department, but they had taken over the law part of the university and we were using the law library as classroom space for meteorology. The physics department had been taken over by what we were told was a

metallurgy project. And I think that extended a little bit into the chemistry department, but we were still using one or two classrooms in the chemistry department.

**[00:25:00]** At the university, we taught physics most of the time, but we were asked to do some research on Mediterranean meteorology, and I was working on that, along with my teaching. And a couple of years later, somebody handed me a monograph from the University of Chicago, and in there was the work that I had done under my name. That surprised me because I had not been told it was going to be published, and somebody else had finished it up because I left it unfinished when I left there.

I left the University of Chicago in July of 1942, rather suddenly, because the Air Corps had set up a contract with the university to establish an Institute of Tropical Meteorology in Puerto Rico, and I was ordered to go there as one of the instructors.

*Now, was this for the Pacific war, then, that they're thinking this way?*

They were thinking that way about tropical meteorology both for the Pacific war, because Guadalcanal—you've heard of the battle for Guadalcanal—had occurred prior to then and American forces were still fighting in the neighborhood of the South Pacific, the tropical Pacific. Also, our American forces had been in Africa starting I think it was like November of 1942 and they were being supplied by air along a route that went through Puerto Rico and Trinidad and down to Natal, Brazil, and across the Atlantic through Ascension Island and then up to Accra and some other large city on the coast of Africa.

*Accra?*

Across the Atlantic Ocean. Accra, I believe. And I can't think of the name of the other place.

*It's OK.*

From there, flights would occur up to Algeria, Algiers, and even up to Egypt.

Shortly after arriving in Puerto Rico to become a teacher of tropical meteorology, well, I had to learn tropical meteorology under the director. The director was Clarence Palmer who had been a meteorologist during the fight for Guadalcanal. He was a New Zealander and had studied meteorology from a tropical viewpoint. Other instructors there included a man who had been forecasting meteorology at Puerto Rico and at Miami for many years, and a fellow by the name of Riehl, who was a German and had specialized in tropical meteorology. So they were teaching me, and I was asked to take a flight. Being in the service, I could fly free on Air Corps aircraft. So they asked me to take a flight down through South America as far as **[00:30:00]** Natal to observe tropical meteorology, which I did.

And I flew to Trinidad. As soon as I got off the airplane at Trinidad, I was met by the meteorologist there. He asked me if I would be interested in going with him on a flight to observe a hurricane which was apparently forming off the coast of the Leeward Islands, or Windward Islands, actually, there. And after asking him a couple of questions, I decided yes, I would go. But I was reminded that when I was studying meteorology back at the University of Chicago, one of the professors had told the class that an airplane would not survive a flight through a hurricane. So that was one reason why I hesitated before I agreed to this flight. But the flight was to be on a B-25, which is a pretty heavy, well-constructed airplane, and I decided that that might be able to survive a hurricane.

So I went. And we flew out to the east. The hurricane was something like 150, 200 miles off to the east-northeast from Trinidad, and as we approached it, the pilot was measuring the winds as he went. There is a technique for doing that where the pilot will simply change the direction of the flight and observe how the airplane drifts on the two legs of the flight and, with a lot of triangulation, is able to determine what the wind is at flight level. He did this a couple of

times, and they decided that—well, first I should tell you where I was in the airplane. The pilot and co-pilot and the weather officer from Trinidad were in the front part of the airplane, and I was in the back with the gunnery sergeant. And we were able to talk to each other by means of the intercom, but intercoms in those days were not very easily understood. I noticed that the airplane had made a turn to the right to get into the center of this hurricane, and I got on the intercom and talked to them and convinced them that they should've turned to the left, which they did, eventually. But in the process they had flown long enough that the pilot was becoming concerned about fuel consumption, so they went a little ways toward the center of the hurricane, but not as far as the eye, before he turned away to go back to refuel. We landed at St. Lucia Island to refuel.

We went back to Trinidad, and I picked up my bag, and the next morning, took a flight on down along the route to Natal. I was on a DC-3—well, in those days, they called them C-47 airplanes. And we flew at about ten thousand feet most of the time. And I was taking notes, of course, as we went, of what I could see of the weather. We flew through the intertropical front, which at that particular time was just a scattering of thundershowers. Sometimes we would have to drop down a few thousand feet to go under the clouds; other times, climb a few thousand to go over them.

We landed at a place on the Amazon River—Belem—and I stayed overnight there. We also landed at a place in, I think it's British Guiana, and stayed **[00:35:00]** overnight there. I'll always remember that because it was an isolated airfield in the jungle. The trees were tall and the tents where we were staying were under these trees, and they dripped all night. Well, it rained, sometimes hard and sometimes it just dripped all night. So I didn't sleep a lot.

We went on down to Natal, and I spent a night or two there, looked around the town a little bit, and started back. I don't really remember much about the return flight. But once I got back to Puerto Rico, I of course had to make an extensive report, and during the flight I had made a number of drawings of clouds, which I turned in.

While we were at Puerto Rico, the first class showed up around the first of September. The first class consisted of graduates from the University of Chicago and New York U[niversity], where the Air Corps was training meteorologists. And a few of the officers were serving at the airports along the route that I had flown to Natal and Ascension and Africa. The classes were about two months long and they were followed, of course, by other classes. And so I was there for about three classes, then I received orders to report to a port of embarkation at New York City.

*Let me stop you here for one second. I want to make sure I understand this. The purpose of your going and the purpose of all this research is to make sure that supplies that are getting down to Natal and then across to Africa, that when those things go, you have a way of predicting the kind of weather problems you're going to have, is that—?*

That is correct. There were actually a number of flights per day along that route, delivering aircraft, delivering supplies. When I was making that flight, I was on airplanes that were carrying supplies. The center of the airplane would be filled with cargo, all strapped down, of course. Usually they strapped that down in the middle of the airplane for balance. And there's space around the cargo so you can walk around. I was the only passenger on all of the flights I was on, so I had the run of the airplane. I could walk around, stand behind the pilot and look out, look at the instruments. Even though it was a cargo airplane, there were windows, so I could look out the side anyway.

And yes, the reason for weather officers at all of the airports along that route was to make sure that the pilots knew where the thunderstorms were going to be and how strong they were going to be and so forth. They were handicapped because there was not a large network of weather stations. They had to depend mostly on the reports they received from other aircraft, the forecasters did. So they were severely handicapped. It turns out, later on, I studied the aircraft accident reports for that route, and I was amazed at the numbers of accidents and the frequency with which the aircraft was lost, because there's no place to land except in the jungle or, if they're close enough to the coast, to ditch the aircraft, so that the aircraft would be a loss **[00:40:00]** anyway. There were some pretty famous pilots lost along that route, and one of them was a famous football star, I remember, but I can't remember the name, I think it was Tom Harmon.

*We can find that. Well, thanks for clarifying that. That helps me understand it.*

Well, let's see, my tale has gotten as far as the port of embarkation in New York. But I had two weeks of leave that I could take to go home, so I went home and discovered that my parents had decided to retire from the farm and were living in town. Of course, I knew this from correspondence, but I'd never seen the house where they were living. They were living in the town of Russell.

Going to the port of embarkation in New York, I stopped at the University of Chicago and had a conversation with the head of the meteorology department there, whose name was [C-G] Rossby. Dr. Rossby is a Swede with an international name in meteorology. He has written a number of papers. When I stopped to see him, he handed me a paper that he wanted me to take along because he wanted me to hand it to the head of the French meteorological service who was

stationed in Algiers. And Rossby knew that I would be going—or he thought; he wasn't sure. He thought I would be going through Algiers.

Well, he was right. When I got to the port of embarkation, I was told that I would be assigned to a station that would require—I was not given the location at that point. I was told which airplane to get on and the direction in which the airplane would be headed. And I was in a hurry because the airplane I was supposed to be on was supposed to be leaving within a couple of hours and I was still in downtown New York City. It was number One Park Plaza; I remember that. That was the port of embarkation. So I handed them—I was naïve enough that I was still carrying a little trunk. What do you call them? I can't think of the name of them.

*Like a footlocker?*

I was not permitted to take a footlocker, so all my belongings had to be repacked into a duffel bag. I didn't have time to do that, so the transportation person there volunteered to have it done if I would go and get on the airplane. So I just dropped everything except I was carrying a handbag with my essentials in it. I took it with me, and I never saw the rest of my belongings the rest of my career because if they did repack them, they put them on the wrong airplane and they never found me. I'm convinced that they never bothered to repack them, that this was just a way of getting me stripped down to bare essentials.

Anyway, went out to Mitchell Field, which is out in the middle of the fields of Long Island. At that time, they were fields; now it's mostly houses. We flew to Newfoundland, from Newfoundland to the Azores, the Azores to Casablanca, Casablanca to Algiers. Arrived at Algiers, I think it was on the Saturday night, and the plane was going to lie over there and fly the **[00:45:00]** next day. And I had several hours, so I made a few inquiries and phone calls and located this fellow, the head of the French meteorological service that lived in Algiers. And on

Sunday morning, I found my way to his apartment. I called him first, and I'm sure I got him out of bed, and when I arrived at the apartment, he and his girlfriend were still in their bathrobes, but they invited me in and we sat. They had a French-English dictionary, and so we had a sort of a conversation using that dictionary.

When I got back to the airplane, they took off and landed at a place on the heel of Italy. I can't think of the name of the town yet. But I asked the pilot if I should get off here and he said, No, stay on. You're the next stop. So the next stop turned out to be the town of Bari, on the east coast of Italy, south of the front line of military action. So it turned out that Bari is the headquarters for the meteorological office—well, it's the headquarters for the Mediterranean Allied Air Forces, and they had a meteorological office which made forecast maps for all of the weather stations that supported the bombers and the fighter aircraft and so forth in southern Italy. As a matter of fact, I think there were a few airports on Greek islands, as well.

And that's where I was stationed for the next year or more. We made forecasts for—well, the meteorological office was divided into two parts. One handled the flying weather, which is thunderstorms, clouds, hail, that sort of thing. The other part of the weather station was upper winds. We had to have our own set of charts. And we forecast the winds from which the navigators would prepare their navigational plans for the flights. And I was assigned to the upper wind operation along with, as it turns out, Fred White, who had been my friend at Mission, Texas and also at the University of Chicago.

And we spent the next year doing that. There were a few interesting experiences. For one, we were sitting there working one day when all of a sudden, the building shook and the windows caved in and we thought sure that the Germans had dropped a bomb on us. But there was just the one shake and we decided that it couldn't be a bombing, so we stopped running for the doors.

We, incidentally, were on the third floor, so we had to go down several flights of stairs. Turns out that a shipload of ammunition located about a mile away had blown up and enough of the blast wave had gone over the water—our building was right on the coast—that we received a large part of the blast. The blast itself pretty well destroyed the port and the buildings up to a half a mile away.

**[00:50:00]** *Wow. And you're housed in existing buildings there where they had been built?* The weather station and the headquarters for the Mediterranean Air Force was in a five-story building on the coast, but we lived in hotels—as a matter of fact, I think all of us Americans lived in one hotel and the British in a different hotel—that was quite some distance from the coast. It was a nice hotel, probably the best one in town, and Fred White and I shared a room. The rooms did not have bathrooms; they had a common bathroom down the hall, which is typical European style.

Another interesting experience there was a couple of months after I arrived, we were asked to make—well, first, I arrived there around the first of May, 1944, and at that time all of the military action was occurring in northern Italy. One of the first forecasts that I had to make there was for the bombing of the [Monte] Cassino monastery that was the fortress that the Germans had made to hold the line. The Americans spent several days bombing nothing but that monastery and the facilities around it to permit our troops to take it. Then the line bypassed Rome—the Germans had decided not to make a stand for Rome—and was reestablished some distance north of Rome, just short of the Po Valley. I know that Florence and Siena were on our side of the line because one day when I had a couple of days off, I visited a Chicago classmate that was stationed at an airport just outside of Siena, and we did quite a lot of sightseeing. We

went to the big church building in Siena and the art buildings in Florence, and we even went over to Pisa, where the leaning tower is, and got to see that.

*So there was a lot intact, even though, you know—?*

Even though the Germans had held that area, they had not made a stand at any of those cities, so they were fairly intact. You could see damage here and there, but the major sightseeing places were not badly disturbed.

On August 15, well, starting a couple of days before that, our office had been asked to make forecasts for air operations over southern France because the Americans were planning an invasion of southern France. The invasion of Normandy on D-Day, which was June 6, I believe it was, of 1944, that passed without much observance where we were.

**[00:55:00]** *I was going to ask you about that.*

We knew that it was going to occur and we knew a little bit about the plans, but that invasion stalled before it reached Paris, and the Americans decided to invade *southern* France to get some of the German troops diverted down to southern France, away from Paris. They weren't too successful because the Germans didn't put up much flight in southern France.

But I had the experience of getting a ride in a weather reconnaissance airplane, flying from Bari out over the invasion point in southern France just a few hours after the invasion had started, so I was able to see surface ships, LCDs and LT—landing troop—I've forgotten the names of them now. But there was surface craft still approaching the coast as we flew over to observe the weather. After we were over that a few minutes, the pilot suddenly pointed off in the direction to the northeast and said something to me over the intercom. I was riding right behind the pilot. It was a P-38, which is a twin fuselage airplane with the pilot in a pod in between those two fuselages. And they had removed some of the radio equipment—the reconnaissance aircraft

apparently didn't need all of the radio equipment—and there was just enough room for one passenger to sit right behind the pilot. I couldn't tell what he told me then, but I learned later he was telling me that there was a German airplane visible off there in that direction. So he changed our course rather suddenly and put his sticks all the way forward to indicate—well, to get all the speed he could out of the airplane, and we headed back to Bari. But that was an interesting flight.

Another time, this was in November, I think it was, of 1944, we had had a cold front cross all of western Europe and had crossed the Alps and came down the sea there—I keep forgetting the names of things, but it's the sea that separates Italy from Yugoslavia.

*Adriatic.*

Adriatic Sea, yes. And the weather reconnaissance flights, and even a few military flights, took a large number of pictures of waterspouts in this cold air that drifted down across this warm Adriatic Sea. There must have been hundreds of water spouts that day. I didn't get to see any waterspouts, looking out the window, but they were further north.

The forecasts that we were making were for flights usually into southern Germany—well, northern Italy, where the Germans were, as long as the Germans were there, and then into southern Germany, and to bomb the Ploesti oil fields in Rumania [Romania], I think it was, **[01:00:00]** where the Germans were getting most of their oil for military operations. Later on, after the Russians had pushed the Germans back far enough west, it was possible for our military aircraft to fly from Italy to the Ploesti oil fields and then continue on to Russian territory to refuel and return and bomb them again on the return flight. But that didn't last very long because the Russians took over that area and the Germans were forced back into their own country.

It was around the first of August—well, before we get there, it was in the winter of 1945 that *our* weather operations started cooperating with the weather operation just outside of Paris.

One or two of our meteorologists would go there for a couple of weeks, and one or two of theirs would come and visit *our* station for a couple of weeks. And around the first of May, it came *my* turn to visit Paris. Obviously, I took that opportunity. The weather station was actually at Saint Germain, which was outside of Paris. And I was there, then, when the Germans surrendered. And as soon as the fellows that had been there for several months learned that the Germans had surrendered, they all asked for time off. They wanted to go into Paris. And they left me in charge of the weather station, along with a few other people. So I got into Paris the next day. By the next day, most of the celebration was over, but there were still a lot of people celebrating and I was able to get into some of the interesting parts of Paris. I saw the Arc de Triomphe and the Opera building, and those are the ones that I remember, but I don't think the Louvre was open at that point.

*Wow. What a time to be there.*

Well, I was transferred then. There was no need for a weather service for the bombing aircraft or the fighters, so those airports were closed and I was transferred to the airport at Rome because that was the center for transport operations.

*Let me ask you a question about Paris, though. What kind of sense, you know, being a part of the war effort, you're there in Paris at that time, you must have a great sense of accomplishment, whether or not you, you know—I'm asking what that must feel like for a young soldier whose life has been devoted to that for all those years. What kind of thoughts would go through your head? Do you think about it?*

Well, I didn't have great thoughts about what a great thing we were doing.

*You didn't. OK.*

**[01:05:00]** All through the war, to me, it was my job, what I was being asked to do, I'd do it. Obviously, I knew that it fit in to a big picture, and looking back on it, that's why I get all teary-eyed occasionally, not so much about what was happening at that point, but looking back on it, the effect it had on the world.

*I guess that's right, you can't really in the moment, and I think with age and understanding, you probably can comprehend its significance, maybe, more than you can when you're set right down in the middle of it.*

That's right. When I was there, it was a very interesting experience, and that was pretty much the way I looked at it. I knew that a kid my age had no business being there, doing those things. Well, I *did* connect what we were doing with everything else that was happening, and I knew that the military aircraft, the bombers and the fighters, were dependent especially on winds, and obviously we were trying to do the best we could. We had access to German data. We picked it up by radio and we had a crew of people that were doing nothing *but* that. They were collecting this information, translating it from the German code to our code, and our people were entering it on weather maps, and I was analyzing the weather maps, making the forecasts. And we were unhappy when we were wrong, and you haven't been in the weather forecasting business very long before you learn that you're never all right. Your forecast is never perfect. For one thing, you forecast for a large area and you might get part of the area right, but not all of it. There are several layers in the atmosphere. You might get one of them right and miss the other areas. There are a lot of meteorological phenomena to be concerned about: fog, fine weather, rain, thunderclouds, rain, snow, lightning. Over there, there were the funnel clouds, the waterspouts. So we had to worry about everything like that, but we could never get a forecast all right. We just did the best we could.

*Sure. It's a complex system and it's a dynamic system, it seems.*

I remember one day the winds were fairly light all over northern Italy and southern Europe. There was a big anticyclone, a high pressure area, over all of that area, and the head of our unit, who was a Lieutenant Colonel Nelson, a pilot meteorologist, he got the idea that—I mention his name. He had two positions. He was the meteorological advisor to General Twining **[01:10:00]** who was the head of the 15th Bombing—Wing I guess it was, and also he was the top general of all of the Mediterranean Air Forces that were in that headquarters. The British had a couple of units there. The Australians had a unit. The Balkans— I've forgotten whether it was Greece or one of the other Balkan countries—were represented. And the South Africans were there. So we saw people from all of those. The British had their own meteorological office there, which came and coordinated with us every day, so we were all doing pretty much the same thing.

*You know what? I'm going to stop you right here.*

**[01:11:13]** End Track 2, Disk 1.

**[00:00:00]** Begin Track 1, Disk 2.

*UNLV Nevada Test Site Oral History Project, interview with Philip W. Allen, disk number two, July 9, 2004, conducted by Mary Palevsky in Las Vegas, Nevada.*

**[00:00:17]** End Track 1, Disk 2.

**[00:00:00]** Begin Track 2, Disk 2.

After the airfields were closed, I was transferred to Rome. And I didn't have a lot to do there because I was promoted to major, which made me the same rank as the head of the station there, and he was anxious to get rid of me. It was around the first of August of 1945 that I received orders to go to the Pentagon. And I just assumed that that was the first step to the Pacific,

because we still had the Japanese to deal with. But it was shortly after that that I heard about the dropping of the first A-bomb over Japan.

*Where were you then? You were still in Rome?*

I was still in Italy, in Rome. And three days later, of course, the second one was dropped on Japan. And it was about the next day, I think, that I caught the flight back to the Pentagon. I went back, just retracing the steps that I'd taken going over there: a small airplane as far as Casablanca, and a DC-4, which in those days was the largest transport airplane available, from there back to New York. And somehow or other I got a flight down to Washington, was met by my brother, went into Andrews Field. My brother Roger was a meteorologist at the Weather Bureau. So I went out and stayed with them. Then I went over to the Pentagon. But before I went to the Pentagon, the—I'm trying to think of the correct date. I think it was the fourteenth day of August it occurred—and if I remember correctly, that was a Monday. I'm not sure. But that was the day that the president announced that the Japanese had surrendered. So Roger and his family—he's got two kids, with his wife—drove into Washington and we were trapped in traffic, oh, three or four times. I think we only got down about as far as the Mall and decided that that was no place for us, so we went back to his house, which is out in Virginia.

And it was either the next day—probably the next day, or the day after—that I went over to the Pentagon then, and was told—by the time I found the place where I was supposed to go; that's a big place—by the time I found the office where I was supposed to report in, the Air Force had come up with the option that people could leave the service, get out if they wanted to. Well, the way it was put to me was that I was scheduled to go, not to the Pacific, but to Chanute Field to teach meteorology to weather people.

*And where is that?*

Chanute Field is in Illinois. It's about sixty or eighty miles south of Chicago. And all during the war, it was where the military trained their sub-professionals, the people that go out and make weather observations, and they even teach some forecasting there to sergeants, NCOs **[00:05:00]** [noncommissioned officers]. And that's where they wanted me to go to teach. But with the option of getting out of the service, I chose the option of getting out of the service. And I went back to the Weather Bureau then and told my brother about this, and he got on the phone and made a phone call, and next thing I knew, I had an appointment with the chief of the Weather Bureau. So he went with me, showed me where it was, and we went up and talked to Dr. Reichelderfer , was the name of the man who had been the chief of the Weather Bureau for a good many years.

Well, one of the first things he told me was that with my Air Force grade, that I was probably eligible for a P-4, which was one of the levels of grades in the government in those days, but that they never started people with my experience higher than level P-2. So he offered me a job at the level of P-2, but the job that he offered me was one of forecasting for transoceanic aviation from La Guardia Airport, which was the main terminal in New York City at that time, across to London and Paris. And I accepted.

*Let me ask you one question before we get going. In this era, when the bomb is dropped in Japan, with your knowledge of physics and things, are you thinking about the fact that it's an atomic bomb at that point, or are you conscious of the significance of that?*

I was. I knew enough about nuclear energy to have an appreciation for what had happened. It wasn't until the bomb was actually dropped, though, and I read some of the news reports that I realized what all had been going on to come up with the bomb. And it was somewhere along about there that I learned about the first atomic pile that was built under the stands at Stagg Field

out at the University of Chicago and realized that while that was being built and tested, that some of us instructors at the University of Chicago had been playing out at Stagg Field. We would play touch football or softball or whatever. And I can always remember when I got home and talked to my father, he had a lot of questions for me about how the bomb had been constructed and so forth. Well, some of them were things that I could tell him, but a lot of it was still over my head.

*Great. Thanks. I was curious about that.*

But there was never any doubt in my mind about the necessity for using it in Japan, and it just never occurred to me that anybody would have done anything different. And it wasn't for a good many years afterwards that I began to hear people question whether those bombs were necessary. **[00:10:00]** It just never occurred to me, because everybody that I talked to who had been in the Pacific had been expecting there to be a bloodbath once they tried to invade the islands. The history for that is what happened at places like Iwo Jima and some of the other islands out there where the Japanese really put up a hard fight.

Well, after seeing Dr. Reichelderfer, I—well, my instructions for separation from service were to go to Jefferson Barracks, which is a little military outpost south of St. Louis, on the Mississippi River. I went to Jefferson Barracks and they would hardly talk to me. They just handed me a piece of paper and tickets to go to Santa Ana, California. And, like you, why Santa Ana, California? All that they would tell me was that was where I needed to go to separate. And so I did. Remember that car that I bought right after left Selfridge Field, and drove to Texas and back? When I went to Puerto Rico, I sold that to Fred White, my friend, and he got married before he went overseas, and he left the car with her, and she was in living in Cincinnati. When he knew that I was coming back to the States, he stayed in Europe. He had an administrative

assignment up in Germany, because he was a good administrator. He suggested that I stop in Cincinnati and pick up the car and used it. He said his wife wasn't using it and it was just sitting in a garage someplace. And so I did. I got a ride back to Cincinnati with somebody that was going that way, and asked her, and she agreed, and so I picked up the car and drove it west.

*Now, because this car has become a key element of your narrative, you have to tell me what kind of car it was.*

Oh, it was a '41 Ford. It was used when I got it. I got it March of '42.

*What color was it?*

Black. What other color was there?

*I don't think there was. I just wanted to make sure.*

Yes. It was a Ford. And it was still running well, yet. So anyway, I drove it from Jefferson Barracks up to see my folks in Iowa, and took a train from there out to Santa Ana. And the Air Force wasn't ready for me in Santa Ana, and they had too many people going through, so it was over a month before they separated me, during which time I made many trips by shuttle bus into Los Angeles to look around, visit the tours of the homes of the stars, and went to some of the broadcasting stations where they broadcast from Hollywood, you know. So I had a good time there and did an *awful* lot of reading and listened to lectures. The VA [Veterans Administration] **[00:15:00]** Bill had just been out for a few months and was being explained to the servicemen as they separated, so I learned about all the schools I could go to, and that's the only thing that interested me at all, but I think they also told about VA loans you could get, things of that nature, for houses. But I didn't pay any attention to any of that because I already had a job with the Weather Bureau. Only trouble was that the Weather Bureau couldn't hire me until I was completely out of the service. And so the Pentagon had told me that my service extended until

the middle of January. I was on leave, all the leave that I had accumulated all that time. So I went back to Iowa and fooled around there and went to, I don't know if all of this is interesting or not—.

*It is.*

I went to a homecoming of Parsons College and lo and behold—well, when I was in Chicago, I learned to dance. I had never learned to dance until then. They had a homecoming dance and there was a young woman there whom I had just barely known. She had been a freshman when I was a senior. Jean. Jean had married a friend of mine and he had not come back from the war. I knew this. But she and I had fun dancing.

And then I went back to Ames, where I had been going to Iowa State College and working in the physics department. At Ames [Iowa], the head of the physics department remembered me and offered me a job. Temporary. He needed somebody to help him teaching a Navy class in physics. So I worked there for a couple of months. And Jean was living in Des Moines, which wasn't very far away, so we started dating, and the obvious happened. Before I left there, we became engaged. And then I got word from the Weather Bureau that they didn't want me in New York right away; they wanted me in Washington. They had an overseas unit in Washington, too. So I went there first. And Jean came, visited me once. And we had set a wedding date for May, and she visited me, I think it was March. We decided that we'd better go to New York and check out housing. So we did. And lo and behold, New York had rent controls, so nobody had built very many apartments there and there wasn't an apartment available anywhere. We went to an agent and they said that I'd have to wait for whatever housing we had anywhere in New York.

*This is in the city itself, in New York City?*

Well, yes, anyplace. But he said he knew of a little housing development that was under construction way out on Long Island in Queen's Village. A group of five houses were being built and one of them was still available. And we discussed that a little bit, but since that was the only thing available, they wanted a thousand dollars or so **[00:20:00]** down. I wrote them out a check for a thousand dollars and we bought a house there. And I don't know what would have happened if I hadn't been transferred later on to New York, but I had been promised a transfer.

We were married in May, and I reported into New York immediately afterwards, so our honeymoon was a trip by way of Niagara Falls to New York.

*Wow. And you had your house. That's great.*

We had our house. An empty house. We moved into it with two bags. Jean, I think she had not more than two bags, and I had one bag. And we slept on the floor, I remember, the first night, but we were able to get a bed fairly soon and gradually furnish the place.

*So this was like a little, small, what, two-bedroom house, or three-bedroom?*

There were two bedrooms and an unfinished attic. Brick veneer house, but it had a stone front. Really quite a nice little house.

*Some of those houses in Queens were great. I remember.*

Yes. But across the street were older houses, twenty or thirty years old, and older families with lots of kids.

At New York, my job was to forecast for overseas aviation. And in those days, all of the overseas flights left from La Guardia, and the airlines themselves did not have meteorologists yet. They were starting to get some, but the pilots *and* the aircrews and frequently even the stewardesses would come into the weather station there to be briefed for their overseas flight,

and we hand each one of them a folder with charts of the winds and the weather that they might encounter across the Atlantic.

After a couple of years there, I received a phone call from Washington, from Fred White, who had taken a job in the Weather Bureau in Washington. He was the administrator for the head of the research division of the Weather Bureau, fellow by the name of Wexler. Fred called me and wanted to know if I would be interested in heading up a weather unit at Los Alamos. There was no weather facility at Los Alamos and they felt the need of one. And I said, Sure. So he started processing, or sent me forms, rather, to fill out to have a clearance processed, which I filled out and in due time, it came through. Number 450-something or other. Well, each clearance has a number. Well, before anything happened at Santa Fe, the people at Santa Fe had decided that they wanted their own people in their weather station; they didn't want anybody with the Weather Bureau there. But the Weather Bureau had already provided the station at Oak Ridge and at Brookhaven.

*OK. So this is the Santa Fe office of the AEC [Atomic Energy Commission] at this point, that we're talking about?*

Not Santa Fe. Los Alamos.

*The Los Alamos office. OK.*

Los Alamos. Yes. So I decided—well, that was the end of that, but it wasn't long before I had another phone call. They wanted to know if I would take the same kind of a station at Hanford, [WA] **[00:25:00]** and [I said] okay. But that one, too, fell through, and it was a while longer—well, somewhere in there, this business with Dr. Schaefer came up. Schaefer was a professor at Syracuse, is it, I think, University. He had discovered that by injecting dry ice crystals into the atmosphere, they could increase the frequency of rainfall or the amount of rainfall, providing the

weather—I guess they discovered this with respect to fog. They could disperse a fog by injecting it with ice crystals. And that was what they were planning to do at Brookhaven [National Laboratory] when Dr. Wexler called me and wanted to know if I'd go out and observe what they were doing, for the Weather Bureau. And the fellow who was in charge of the weather station at Brookhaven at that time was not very happy with this. So I was there one day and never went back.

Eventually, I think I was at La Guardia for three years, and Fred White called me again and wanted to know if I wanted to get into some atomic energy work, but he couldn't tell me what it was. And he invited me to come down to Washington, which I did, and he told me about an organization called AFOAT-1, meaning Air Force Office of Atomic Testing, dash one. Apparently there was an organization without the dash one, but the dash one was attached to an organization that was fairly new and it had been formed for the purpose of studying foreign nuclear explosions. And they told me about the flights being made by the Air Weather Service off the east coast of Asia, down along near the Kamchatka Peninsula, past Japan, to Okinawa—I'm not sure if they turned around at Okinawa or someplace else—and went back.

Anyway, I took that position, and we moved to Washington. And I started looking at what the weather people knew about tracking things in the atmosphere, so it involved drawing trajectories of air and studying the spread of debris in the atmosphere. And you don't deal with that aspect of the atmosphere without very quickly learning that the wind is different at different levels through the atmosphere and the material will fall through different layers and the tiny particles of debris will diffuse upward as well as downward, and it gets to be a rather complicated situation.

AFOAT-1 had already contracted several research projects to study the problems. One was with the Weather Bureau to study atomic debris trajectories in the atmosphere. Work was being done at RAND Corporation in Los Angeles, which is a think tank, another was at the New Mexico School of Mines where the head of the meteorology department was a fellow who had gone to Chicago in one of my classes that I had taught. There was a project going on at Cornell University **[00:30:00]** in New York State. And it seems like there were one or two others. Anyway, I was coordinating all this research for the AFOAT-1 organization.

I showed up at AFOAT-1 early in May of 1949. It was on about September the third, I believe, of that year, 1949, that one of the aircraft that had been flying along the Kamchatka Peninsula returned back with a hot [radioactive] sample. And in due time, that sample was analyzed and a half-life was determined which would indicate that the detonation had occurred on something like August 27. So I had the Weather Bureau run air trajectories backwards, starting on the date that the debris had been picked up, and that was September 3, going back as far as August 27. And they ran a trajectory back. They had been able by radio to pick up the Russian meteorological data, so they were not flying blind, although there wasn't a lot of data. They came up with an origin that was in European Russia. And it wasn't until much later that they learned that the way of computing half-life—they had given too much weight to one of the isotopes, and the actual mean half-life for the debris—there are a lot of half-lives in a debris cloud, of course—the mean gave a starting date of August 29, I believe it was, two days later. And doing that gave a source very near to where the actual source was, which was near [Semipalatinsk], I believe is the name of the place.

*Wow. That's amazing.*

So that we were only a hundred miles or so off.

*I think I asked you this when we were chatting, but I'm curious if you can explain. The plane is flying, the air is coming in—how does that work? It goes through a filter of some kind that you collect?*

They were using B-29s at this time. I got that wrong when I wrote it up the first time. I had B-47s, but the B-47s are jets and they weren't using jets yet, then. They were using the B-29s. They had a filter attached to the airplane, and I think it was attached to the fuselage so that the person inside could reach into the box and change the filter. They would change the filter every three hours at that point, because they had never had any appreciable amount of radioactivity before, just natural radioactivity.

But they collected this sample over a three-hour period, so over three hours the airplane had flown pretty much the length of the Kamchatka Peninsula. So they had to start trajectories at the beginning, at the end, of this filter, and a couple of places in between. Although where the trajectories that reached the end of the filter actually started up in northern Siberia. The ones that reached the first of the filter down south of Siberia. In between, they had a trajectory that started near where the source actually was. Later on, they were able to run additional airplanes over that **[00:35:00]** route and change the filter every hour or oftener, and find out better where the center of the cloud was. By that time, more of the cloud had moved past and they were able to fly at different altitudes and get a better picture of how wide the cloud was and how high.

*This is so interesting because it's this early Cold War history and nuclear history, and it's just something that until I started chatting with you at the [Atomic Testing] Museum a couple of weeks ago, you know you never really think about the thought that's going into, How are we going to know what the Russians are doing with atomic weapons?*

Yes. Well, you mentioned that there are some things that can't be talked about, and there are still things going on that can't be talked about. But this organization, AFOAT-1, was able to collect

the debris from subsequent atomic tests by the Russians and was able to, through conventional intelligence, find out more clearly where the source was. And at the same time, they were studying the acoustic wave that the explosion makes through the atmosphere. Through the earth there's a seismic wave that has its own peculiar signature, so they had to learn this from experience: separate a nuclear source from a natural source. There are a lot of acoustic waves going through the atmosphere all the time, and they had to separate those out. And it's interesting to know that they had to separate natural radioactivity from these filters. Some of the clouds were so thin that it was hard to tell what was natural and what originated with a nuclear explosion. The natural radioactivity occurs in practically everything, paper, and they were using filter papers, so a natural paper filter was radioactive before they ever put it in the box on the airplane. All of this had to be taken into consideration.

Well, the Air Force Weather Service was taking these samples off of Siberia, and they weren't very happy with the Weather Bureau having a representative in the research side of AFOAT-1.

*You.*

Me. So they wanted me to disappear. This didn't actually come to a head while I was there, but after about three years of this, things weren't changing much, and it turned out that the technical people at AFOAT-1 really wanted to talk to my boss, Lester Machta, at the Weather Bureau research offices. They didn't want to talk to me. I was just an intermediary. So I decided to leave that job and I went back to the Weather Bureau and worked at its analysis center for three years.

*Because they're just going directly to him rather than communicating with you.*

Yes. Yes. Well, I was just a carrier for information, usually. Dr. Machta was in charge of a research group of a dozen people or so, and *they* were doing the work. I was just in between. And

these other places—I had visited RAND a couple of times, and New Mexico, and Cornell—they weren't producing anything that was useful. They were doing research and they weren't finding anything that was really helpful, so all of the help was from the Weather Bureau, and I was just a carrier.

So in May 1953I went to the Weather Bureau and was assigned to the analysis center there, and that's **[00:40:00]** when President Eisenhower, in those days, his administration decided that if the Russians were going to be dropping A-bombs, the U.S. had better prepare for an attack. And what was going to happen to the government if they attacked Washington first? So they started looking for a place to put a pseudo-government, a replacement government, in case Washington was attacked. And so in 1954 they tried first an Army post in Maryland—I forget the name of it now, possibly Ft. Meade, Maryland— and they wanted various agencies in government to send representatives there. Well, I was the only one working that could be spared, apparently, who knew anything about atomic testing, so they asked me to represent the Weather Bureau. And nothing much happened that first time. I made a report back to the Weather Bureau about what *did* happen. The next year, they went to a different place. For their alternate headquarters, they went to Mount Weather, which is out in Virginia about fifty miles west of Washington. It's a small mountain. There had been a weather observing station there for many years, where they made extensive observations that they don't make at most stations. That's why it was called an observatory. My brother Roger had actually overseen that activity for several years before it was taken over for what they called High Point, which was the codename for the alternate government.

In 1955, the Weather Bureau sent me out again, but this time the AEC also sent a representative who, at that time, was Josh Holland. Josh Holland was in my class at Chicago—he

roomed right next door to me—and he had set up the weather station at Oak Ridge and also the Weather Bureau station at Brookhaven. And he had been kicked upstairs to AEC headquarters. And he went out, and he and I together prepared fallout patterns for nuclear attacks on Washington and New York and one or two other places, Boston and probably someplace else. I've forgotten where. And we had these maps up on the wall, showing everybody that was involved what they were going to have to deal with in these other places. And that's when President Eisenhower visited. Whenever the president goes, he has quite an entourage, and the first thing I knew, the room lit up, and we had heard that he was coming, so we were prepared for him, and he came over and looked at our charts and we told him what things meant on there. He stayed for, oh, five or ten minutes, I suppose, and then went on and went someplace else.

Anyway, we reported that back to headquarters, and it's my understanding that they dug tunnels in that mountain and built quite an installation out there.

*Yes. I think I once saw a show on that, that that did—I think that's the place you're talking about.*

I'm sure it is.

*High Point. Yes. Amazing.*

**[00:45:00]** A year or so—well, less than a year later, I think it was around February of 1956, I was—well, my job at the Weather Bureau was to—I was a shift supervisor, which meant that I supervised everything that happened on my shift. They had three shifts a day and we rotated from evening to night to day. It was my job to take a look at what other people had prepared in the way of analyses and forecasts and give my stamp of approval, and I had my own charts to prepare, which included a map of the northern hemisphere winds at eighteen thousand feet altitude and five hundred millibars of weather pressure, air pressure. And so I was forecasting

weather for the northern hemisphere every day. But I was at work one day and a couple of Machta's employees came by and we talked about general things and they said, among other things, that AEC had asked them if the Weather Bureau would provide weather service at the new Nevada Test Site. Well, I had been out to Nevada in connection with the first test there, Ranger, in January and February of 1951, and again that autumn, in October and November of 1951, because I was interested in what happened to the radioactive clouds, and I had visited the test site in order to collect the data that the tracking aircraft radioed back about the locations of the clouds. I had that to work with, and that was one reason that I had been selected for the High Point jobs. Well, the fellows told me that the Weather Bureau was asked to set up a permanent weather station at Nevada Test Site, and I said to them, `That sounds interesting. I wouldn't mind going out there.` And they went back to their office and told Lester Machta and Fred White this, and within an hour or so, I had a phone call from Fred White. He was quite angry that they had told me this because it wasn't firm at all, but he wanted to know if I really was serious about being interested in going, and I said, yes, I was, and the reason I was, was because—well, I had left out something there. I had left out, when I transferred over to the analysis center, I had had a month with little to do in which I was helping Lester Machta in his office, and he was invited to serve on the advisory panel to the test director at Nevada Test Site for tests that spring, in 1953. He didn't really want to go, and he wanted to know if I would be interested in going, and you've gotten my stock answer anymore. If it's new and different, I say yes.

*Yes, I'm getting that message. Absolutely.*

**[00:50:00]** So I delayed my reporting in to the analysis center for a few weeks while I went out to Nevada and served on that advisory panel. Other meteorologists on that panel were a couple of

colonels that I had met when I was in the service. I didn't know them well but I knew them by name. And that was when I was introduced to the safety problems of testing nuclear devices.

That advisory panel is appointed by the test manager, who is responsible for safety at the test site. He had contracted with the Public Health Service to provide offsite services in connection with their potential exposure to airborne radioactive particles and fallout. And he's the one who listened to the weather forecast before each test to see if the weather was going to be suitable for testing that day. The weather was important to them because it involved the ability of the aircraft to fly without any problems. That included the airplane that carried the bomb, in case the bomb was dropped from an airplane. It included the observer airplanes. When a bomber is carrying nuclear weapons, they usually send a plane along with it to watch, to see what happens. And they also had aircraft there to track the cloud and sample the cloud because the sample of radioactive debris from the cloud is used to analyze to determine what happened in the device. And when I was visiting out there for AFOAT, I was collecting radioactive cloud trajectory information from those aircraft.

But in preparation for testing the device, the test manager listens to information on the nature of the device itself, its yield in kilotons or megatons, what the maximum possible yield might be and what the most likely yield should be, and any special changes in the device that might affect the test in some way. In making his decision, he would get information from employees working around the test site as to where the people were, where they *had* to be in connection with a test, and where they could be moved from and to, and any other activities that were going on in the area that might be affected by the test. For offsite, if the cloud was expected to go over ranches or cities, such as Alamo or St. George or any of the other little towns around there, we had to know that. The test manager had to make a decision as to whether to let the

people stay in those communities or be evacuated. If they had to be evacuated, the AEC would pay their expenses and give them a *per diem* and be sure they knew where they were going so **[00:55:00]** that they could get a hold of them and let them know when they could go back to their homes or work.

All of that had to be considered and the test manager, realizing the different disciplines involved, needed advice or felt the need of advice from experts in all of those disciplines. So he had health physicists, doctors, people from the Public Health Service, and engineers and people who helped make the bomb, all meeting in their readiness briefings, the first of which was usually the day before, the afternoon before, the test was scheduled to occur. Knowing all that, I felt that I was prepared when I went to Nevada to answer the meteorological portions of those questions and to set up the network that was necessary to get the answers.

Getting back to where I reported in to Nevada, it was the spring of 1956 and, let's see, I reported in around the first of June, I remember, because as we drove over the hills into the Las Vegas valley, we hit a blast of hot air and suddenly became acclimated—began our acclimation toward the Las Vegas temperatures. But Fred White and I had made a trip out here a month or so earlier to survey the area and decide where our station should be, and we went on to Los Angeles to UCLA [University of California, Los Angeles] and interviewed their meteorology graduates and I hired a couple of them. So that when I arrived, I went to AEC and we were assigned a building next door to theirs on South Main Street—1229, I believe the number was—and I was introduced to the procedure for having work done around the test site connected with the tests. Namely, you called REECo [Reynolds Electrical and Engineering Company]. So I had our building properly equipped and we were in business, sort of, for research purposes within a month. I had to hire the electronic technician away from the Weather Bureau installation at

McCarran Field, but was able to get the rest of my staff from various places around the Weather Bureau and the people who read the announcement that went out and applied. So I ended up with—oh, I brought one man with me from Washington. Les Machta wanted to get rid of him and he was willing to go to Nevada, so he came along, and he worked for me—he helped me arrange the building and design the facility for the first couple of years before I transferred him out.

*So this is when the Weather Bureau has a permanent functioning presence at the test site at this point.*

That's right. Prior to that, the tests were as much or more military than they were civilian. The **[01:00:00]** Atomic Energy Commission took a few years to get rolling itself. So the first test series was almost entirely military, except the test manager was a civilian, and the Air Weather Service, which is Air Force Weather Service, has a mobile unit based in Oklahoma that they sent to Nevada to provide the service. They provided the service for all of the tests up until 1957, which was the first test series that *my* group participated in.

*Which series was that?*

That was Plumbbob. But in April of 1957, before Plumbbob, the laboratories wanted—I think it was Sandia—wanted to conduct what they call a safety test of a device at the test site, where they would explode the high explosive portion of the test but not the plutonium. And that test was scheduled to occur off the test site, just north of the test site, in what is now called Area 51. And we were the weather people. My group by itself provided all of the weather service for that test. We had to set up our offsite stations to take upper wind soundings, and we operated out of trailers, had our national weather circuits extended out to Area 51 and to our trailer, and made our weather maps and forecast maps and forecast for the operation. We had to put weather

instruments, particularly weather vanes and temperature recorders. In those days, we couldn't easily telemeter the temperatures, but we telemetered the wind speed and direction from the wind vanes which we scattered around the Area 51 area. And unfortunately, we had probably correctly analyzed the climatological data for the area, showing a high frequency of light southwest winds during April most years. Unfortunately, on that particular year, it was the year for the cold weather to flow down from the northwest during April, and temperatures were kept low, and during the weeks after we were ready to go—we were ready to go, I believe, on April 10, if I remember correctly—and we sat there waiting for the wind to shift from northwest to southwest, which it did but not to stay, and it fooled around, snowed on us several times and we had five or six inches of snow, bad weather. Took us two full weeks to come up with a day with the wind steady from the southwest. The reason they wanted it from the southwest was that from the device location on the ground, they had set up a network of sampling stations in the northeastern **[01:05:00]** section, a little over 90 degrees, I think, or a 120 degree sector there, they had used for their sampling stations. And they wanted the wind to blow from the device, when it exploded, out across their network. And we had to just sit there and wait for the wind to change, [laughter] which it did eventually. Didn't make a very good impression about our forecast ability, but the test manager and his staff was impressed by our ability to know what was going on.

During Operation Plumbbob itself—it started around the middle of May—the Air Force weather outfit came in and set up, and we cooperated with them. We provided part of the staff that they needed. And at each weather briefing, one meteorologist gets up and briefs the test manager. That was usually the Air Force man because he had done it in previous years. But when he would want to go to town or go home or get tired, as happened sometimes, he would give me the option of briefing the test manager and his panel. That system gave me the dirty

bombs to brief for because on the days when the test manager knew that the bomb was going to be a dirty one and have a large fallout pattern, he was more particular about the winds and there were more delays. So the regular weather briefer would get tired and it would come my turn. He had a different style of briefing than I had, too. And this I understand, having been a weather officer for the Air Force, his philosophy was, we work all day to make this forecast. This forecast is *it*. Period. *My* philosophy was, this is an experiment that we're doing. These are intelligent people that I'm briefing. I'll tell them *why* I think the weather's so-and-so, and I usually had a maybe in my forecast, or several. But I would tell him the most likely thing to happen and the alternatives, in order of descent.

*Right. It sounds like more like the way scientists normally talk to each other.*

Yes. This, I think, made an impression anyway. After Operation Plumbbob, Jim Reeves, who was the test manager at that time, told me that I would be responsible for future tests. And so I expanded my staff a little bit and was prepared when the next test series came along, which was Hardtack, Phase II. That was the last test series at the test site before the moratorium, and the laboratories wanted to test everything that they had anywhere near ready. And the test series started in September of 1957.

*I think it's '58.*

You're right, it's '58. Fifty-seven was Plumbbob. Fifty-eight is Hardtack, Phase II. Started September, and the number of tests increased until the moratorium went into effect, and the date of that was October 31, so on October 30, there were four tests. A fifth test was **[01:10:00]** interesting because it was a fairly large test. I don't remember the expected yield, but it was in the tens of kilotons. The weather, for the most part, was satisfactory all that day. The first three tests were—one, I think, was an underground test and three very low yield tests, and they went

all right, but the fifth one we kept delaying because its cloud would be higher than the others, higher in altitude, and the winds at the higher altitudes were quite strong. Sandia had a system whereby they could predict from the winds and the vertical temperature structure, they could predict the intensity of air blast at great distances from the test site. And they did this for every test, of course, in a test of any great magnitude. In this particular case, it predicted that the air blast would be focused on a spot right near St. George. I believe it was St. George. Anyway, it was a large population to the northeast. And it was that way for several days prior to the thirtieth, and it was that way all day of the thirtieth, and along toward midnight, we started taking soundings every half hour, hoping that the wind would die down just enough that they could conduct that test without breaking windows in St. George. But it never did die down. That test never occurred, doesn't show up on any of the records of Nevada tests, and I don't know what happened to the device.

*Yes, that's a good question. What happened to the device?*

But one interesting sidelight from that is that when Mr. [Thomas] Reed wrote his book recently about, what was it, *Up to the Abyss*?

*[It is]:* At the Abyss. [An Insider's History of the Cold War, Ballantine, 2004]

*At the Abyss*? He made the statement in there that the last test conducted at the test site prior to the moratorium was a surface test and it was never conducted. Well, that surface test *was* conducted. It just didn't have a cloud that went anyplace. The last test that was *never* conducted was this one. The name of it was Madison, I think. It was the name of a president.

*Oh, really? Madison. I'm going to stop right there.*

**[01:13:36]** End Track 2, Disk 2.

[End of interview]