

**CONNECTICUT 20TH CENTURY AGRICULTURAL HISTORY PROJECT
ORAL HISTORIES**

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Name of Person Interviewed: Paul Waggoner

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LL: This is Luane Lange on December 6 interviewing Paul Waggoner who is the retired Director of the Experiment Station at New Haven. The Connecticut Agricultural Experiment Station. Thank you for agreeing to do this. Would you start out by saying where you were born?

PW: I was born in Iowa, grew up there. I attended the...in a farm community. My father was in an agricultural business and had farms and so forth. Although I went to the University of Chicago to study meteorology during the Second World War and served as a weather forecaster in the Air Corps., I returned to Iowa at the end of the war and studied at Iowa State College. Studied plant pathology and climatology.

LL: So originally you hadn't planned to...to stay in agriculture?

PW: Well, I think that the exigencies of the Second World War is what drew me away. Then I went back after the war, I went back of course, as a trained Meteorologist which was a great advantage. I completed my study at Iowa State in 1951. Luckily, I attended a meeting where I met the Director of the Connecticut Agricultural Experiment Station. I came here in 1951 and have been happily employed here ever since.

LL: Interesting, interesting. Did you have brothers and sisters?

PW: Yes, I have a brother who's...

LL: Did he stay out with the family farm?

PW:No. We...our family was both in business and owned farms. My, brother started out after he grew up, as in the...in the sort of family business. He took the part of it that had to do with hauling the produce into Chicago or where ever and so he...he now operates a national trucking firm under the original name of Waggoner. And I ^have a sister who became a physicist and

eventually Dean of the Smith College, he is an academic person now retired and living in Northampton. Then I have a young sister who did remain with the family farm and business although she's recently retired.

LL: So when you came to the Experiment Station what was the Experiment Station like when you came here? What was their focus? You came as a researcher?

PW: The Experiment Station is wholly research. I came into the Department of Plant Pathology. The Department of Plant Pathology here at the Connecticut Station has always been a power house and that's what drew me here. The head of the Department of Plant Pathology in the generation before I arrived, George Clinton, was a superb Micologist. He was the scientist who found the perfect staged sexual stage of the classic plant pathogen, the one that caused the Irish potato famine. His successor was James Horsfall, whose book I have just given, you, who was the Director throughout the late '40's and until the beginning of the '70's. He was the inventor let's say, of the first organic fungicides for control of plant disease. So he...he was a giant in science. The present head of that department is the world authority on the dispersal of microorganisms such as the spores that cause plant disease. So, the Plant Pathology Department has you know, throughout this century been a...one of the power houses in plant pathology in the whole world. The...the largest group of scientists here ...are the entomologists. Now they have really three responsibilities. One is that they have responsibility as State Entomologists and assistants for, first of all, the regulation of the nursery industry in the state as far as pest control is concerned. Then they also in a related thing, have responsibility for the control of forest insects in the state, of which we have had plenty. The sort of long running problem in our forest has been the gypsy moth which arrived just at the beginning of the century. For the first third of the century, the Experiment Station scientists participated in the attempt to eradicate that insect. There were large spray crews out snaking fire hoses through the woods and so forth. By the middle of the century, when I arrived, that effort was seen to be a failure. Then, for the next thirty years, the entomologists tried to tell people they were going to have to live with it. But in the last third of the century the Experiment Station discovered that a fungus, which had been brought over from Asia, by this Clinton, the micologist, a student of fungi. That fungus either had been lurking here for many years and mutated or something or there was a new introduction of it. We don't know which. At any rate, that fungus took over and has now controlled the gypsy moth. The exciting thing is that although we're talking about history, the man who made this discovery, Ten Andreotis, is you know, a man about forty-five to fifty and still leads one of our efforts here at the Experiment Station. So that sort of study of forest/nursery insects is one reason that that group is power.

And they...they...they have become increasingly...they have really risen in the scale of scientific ...talent, expertise and so forth. They...they also of course, have responsibility to understand all the agricultural path...you know, the you know, what gets into the vegetables and the corn and so forth and have carried that work out. The thing that has grown increasingly important...although at the beginning of the century the sort of medical entomology did exist, was that the Experiment Station was responsible for draining marshes all through Connecticut and trying to control the mosquitoes. Well, that's now been passed off to a state agency in Hartford, the DEP. But the...the study of medical entomology is now a main theme here.

LL: Would you explain for the tape what medical entomology is?

PW: Medical entomology is the study of the ticks and the insects that bite us and can transmit disease.

LL: I've had Lyme disease.

PW: No kidding. Well, the people in...who...who understand the reservoirs of Lyme disease; we don't do medical research but we do work on the insects that cause the medical problems and have the people who know why we have the ticks and what to do about them and actually carry out many of

the serological tests on ticks. I guess all of them in the state are right here at the Experiment Station. Now, in studying ticks these same people have found other bad acting diseases in ticks. A---appeared often these are disease only known in Africa before the Experiment Station has found them here. The Experiment Station did a Series of experiments that clearly showed the role of the deer in this disease. Then they also study...and they participated with veterinarians around the state including ones at UConn in showing the existence of Lyme disease in horses and dogs and so on. But recently, mosquitoes have become a news focus of interest obviously. And it was scientists here at the Experiment Station that first detected this last fall, the presence of the West Nile virus in...in mosquitoes.

LL: And the West Nile virus causes...?

PW: Well, you...if you read the newspapers.

LL: Yeah, but you got to put it on this. (tape)

PW: Well, if you read the newspapers you know that the Mayor of ...that it was thought that equine encephalitis had struck in New York City, (N.YC) You know, Rudy wasn't going to stand for this and was spraying and so forth. So, this...this was a big story. It turned out that it wasn't equine encephalitis but another virus called West Nile virus that was causing the trouble. I was the Experiment Station that made the first isolation of this, not in New York City, but down in Fairfield County.

LL: Now when...when....when something like this happens, your scientists are on their research projects that they have developed over time when something flares up, what is the process for them to...to...to change gears to address it?

PW: No problem. No, we are a...we're a research outfit that because of our responsibilities to the state, we are "place" oriented. So if anything is exciting or dangerous with insects in the State of Connecticut, our people are on it, both because of responsibility but mainly because of the insatiable curiosity of the scientist. You know, we...the Experiment Station has maintained an orientation to Connecticut. This is one of the policies that I'm responsible for we...we have kept that orientation whereas once a scientist...science today has to be oriented to problems that will bring a grant from a national body. It's very difficult because of the financing of science the way it is. But never the less, the Connecticut Station has remained place-oriented. And you can. You can make earthshaking discoveries in Connecticut.

LL: Would you go back for the tape and talk just briefly what you know of the fact that this was the first experiment station in the country. They didn't exist before this. There were people here in the state that were so interested in the scientific aspect of...of basically agriculture, back then.

PW: Well, we were talking earlier about Timothy Dwight of Yale in 1800, two hundred years ago. He was a clergyman. He was also a very capable political leader and Yale was thought to be a real center of conservatism. But, it really wasn't really. Timothy Dwight took a young man who was about to study law and he sort of accosted him on the sidewalk and told him he was going to become a scientist. Now this was Benjamin Siliman. Well, Benjamin Siliman did become a scientist. He went to Europe, he studied with great minds and ---Liebigs? & other people-- and other people there in Germany at the time and came back. New Haven became a center of science early in the nineteenth century and Philadelphia and Washington were the other two and Boston somewhat. Yeah, Boston, definitely. Boston, I'll tell you later about their trying agriculture research which didn't take off. Anyway, Siliman had, the universities were really a collection of Professors rather than a bureaucracy in those days. So Siliman had a laboratory sort of on the side you know. And of course his great...the thing that he's especially remembered for is that a group of investors in Connecticut, in New Haven, were approached by sort of a snake

oil salesman from Pennsylvania who had this rock oil that was floating around on pools in Pennsylvania, These investors turned to Siliman and asked him what... was this good for. He told them it was as good as whale oil anytime. So his analysis is looked upon as the origin of the whole petroleum industry. And if you read the history' of petroleum industry in the book, "The Prize" by Urgan, you'll find this first page has to do with these investors in New Haven and Siliman. The investors in New Haven were later driven to the wall by a man from Cleveland by the name of Rockefeller. But at any rate, in the beginning they were all there was. So that was Siliman. Now Siliman certainly was surrounded by farming and he had two men. First a man by the name of Kutkin who sort of worked himself to death as a chemist; very early. And then, another chemist by the name of Samuel Johnson. A forgettable name, but still that was his name, and he was the great giant who studied with Levig, came back to Connecticut to campaign, politic and so forth to start an agricultural experiment station such as he had seen in Germany, In 1875, a gift from a man by the name of Orrin Judd, who was a publisher, caused the establishment of the Experiment Station on the Wesleyan campus, where it existed for two years. Then under the leadership of a giant by the name of Wilbur Atwater, you know, things like discovering that legumes fixed nitrogen and those were things that he did. He remained in Middletown and he was the first Director of the Storrs Station although he still remained in Middletown. He was the first Director of the Office of Experiment Stations in the U.S. Department of Agriculture but he still remained in Middletown. He was quite a guy. At any rate, the Experiment Station then came here and has existed either in buildings at Yale or here on Huntington Street ever since.

LL: Thank you. Now, let's go back to yourself. You came then as a...in plant?

PW: I did.

LL: And so what was your focus of research and then what transpired to move you through the system to become Director?

PW: Yes. Well, Calvin Coolidge said, "If you get in at the bottom of the ferris wheel and don't fiddle with it, why you'll eventually come out on top." I...I had a fairly broad education. I had been a Meteorologist. I had studied physical science as well as biology...and I took the degree in an agronomy department as well as in a botany department. So, after I had worked here in plant pathology for about five years I was transferred to the Department of Soils and ran the Department of Soils and Ecology for several years working on water problems and so forth. And then because I was a Meteorologist as well, I always was interested in agricultural relations with plant diseases, So I continued to work on, you know, how does weather affect plant diseases and how do you simulate the progress of an epidemic on a computer .when computers became available and so forth. Studied stomata and evaporation of water. Then in 1972, I became Director of the Station and was so until '87 for fifteen years.

LL: How...over the period of time, what kinds of things have changed in the way the scientific world works? Or...or the Experiment Station?

PW: Well...well...well...let's you know, instead of, you know, general things about science...they're fascinating, but I think for our present purposes here things about Connecticut and re...are most important. Early in this century, the scientists at the Experiment Station did...well, there was one sort of accidental thing that they did. And that was the man who dis...with a colleague at Yale discovered the first vitamin, a man by the name of Thomas Osborn who was a chemist here...biochemist at the Experiment Station. They discovered Vitamin A and they...actually they also discovered the essentiality of the twenty-one amino acids. These guys were go great, they were just throwing these things off. Things that you know, they'd get a Nobel Prize for today. And they were just throwing them off. This was in the first quarter of the century. And just sort of as a throwaway line, Osborn showed that he could raise a chicken without it ever going outdoors and of course almost all chickens are

now raised in confinement. There is a Experiment Station Bulletin with this you know, handsome Plymouth Rock rooster that had been raised without ever touching the ground. Forgive me if I...it was an Orpington or something but it seemed to me like it was a Barred Rock, Plymouth Rock. Anyway, that was sort of a you know, transformed the poultry industry but it was not really what they were up to. The two things that transformed Connecticut agriculture that were very designed. One was an experiment to recreate the climate of Sumatra that produced the best wrapper tobacco. Under the leadership of the then Director, a man by the name of Jenkins, he said "put up a shade tent or make it more humid and make the light dimmer", and showed that this wrapper grown in Hartford County under a shade tent was sort of indistinguishable from the expensive stuff that was brought from Sumatra. That was the origin of the shade tobacco industry which has...which is sort of a Connecticut trademark because it's so extraordinary and spectacular to see. And because it had been a money maker. So, that was one. The other...the other great discovery at the Experiment Station, started out in cold blood, not an accident but in cold bloody, was research on corn. This same gentleman, Jenkins, who was the Experiment Station Director in the first quarter of the century' made an analysis I think is quite obvious after you've done it. He said, "One form of farming that will continue in Connecticut was dairy farming because at that time of course, refrigeration was pretty primitive and the foundation of dairy farming is corn. Now of course, research here in Connecticut on animal agriculture is done at...at the university. But the plant research has always been the responsibility here at the station So Jenkins shopped around to find a young man who could you know, do corncobs. He found a gentleman by the name of East who came here. After a fairly short time, East went on to be come Professor of Botany or some such thing at Harvard and a second young man came. A Kansan who had been educated in Illinois and who found himself in a bit of a jam because Illinois had decided there was no future in the line of research on com that he was doing. So Donald Foster Jones came here from the University of Illinois and around 1920 made... (there were people over at Coldspring Harbor who had bred you know, made inbreds and had crossed them and showed that that was pretty good) it was Jones that showed how to make it fly, The reason why he made it fly was he showed that the double crosses were also predictable, could be productive and had hybrid vigor. He and his predecessor East were the guys who introduced into the language you know, heterosis, hybrid vigor. From a practical point of view, the...this was one of the world's great inventions.

It was on a par with you know, the light bulb and so forth and changed the world's food supply, feed and food supply forever. Because, not only did it increase the com in the world but it also showed how to make hybrid...hybrids of all kinds and it showed that it would work. I grew up in Iowa. I knew the story of Henry Wallace, Pioneer Seed Com Company. But to come here to the station when I was twenty-eight years old and find, you know, to see the man who had invented...really invented the hybrid com that had inspired me, Henry Wallace, it was an awesome sight. Of course, he was not an awesome man. He was...he was a very...he loved to garden. He wrote gardening columns. He was a great scientist but also a great gardener. A neighbor of this Jones, who's still alive, at least he was recently when I saw him, said that he for years after Jones died he used the little rake with two points that Jones used to mark out the rows in his garden. Jones wrote a gardening column...for the Rural New Yorker. Then, in 1951, the very year I came here, Jones and a colleague by the name of Manglesdorp, showed how to make hybrid corn without---by the use of male sterility. That was his second great contribution, made almost thirty years after his first. He died in '63 I think.

LL: As the Experiment Station has evolved, and as Connecticut's become more urbanized and suburbanized, you mentioned before having a Connecticut focus still. What kinds of things has this combination brought here?

PW: Um hmm. Well, the...when I arrived in 1951, there was a large acreage, an important crop of potatoes, mainly in the Connecticut Valley because those soils in the Connecticut Valley...they are so conducive to many crops but especially potatoes. That crop went on sort of without being diminished for about ten years I would say. Another major crop was open grown tobacco which is the binder for the cigar. It received coup de grace in the 1950's and the coup de

grace was that technologists showed that they could grind up tobacco, reconstitute it like paper, roll it out and make a binder. When they did this, it didn't take very much tobacco to make a lot of binder. So both the potatoes and the open grown tobacco began to decline in the 1950's. Open grown not shade grown tobacco. Unfortunately at that time this suburbanization that you speak of, came along not as a threat but as an opportunity. And the opportunity was to convert a lot of those farms and farmers to nurseries. And so, although there had been nurseries before in Connecticut, they really blossomed at that time. And of course, because there had been some nurseries and because the shade tree...the care of shade trees had always been a Connecticut Station being...I think this you know, the National Shadetree Association or whatever its name is, was actually started here in Connecticut because of the presence of these Bartletts and the Experiment Station here in the state. So there was a sound and thorough knowledge of trees in general. That was then turned to the solution of problems in a new expanding industry, the nursery industry. Well, that has been the most spectacular change that in my time here in Connecticut, half century.

LL: Would you talk about the Bartletts?

PW: I don't really know much about them. As you know there's a Bartlett Arboretum now, I think part of the university, I didn't know them personally.

LL: But they were background interest in...in the shade trees? And then they...

PW: Oh, yes. The arborists of Connecticut have always been, certainly in my half century here, they have been an important force and collaborators of the Experiment Station. Not suprisingly, I think it mainly came out of New York City through Fairfield County, up here. It's in Fairfield County and Kent, Ohio, and the Davey Tree Expert, those are two great centers of arboric culture in America That, I think, was a big help when it came, time to turn a lot of the farming in the state to the nursery industry, which is our biggest cash crop now.

LL: And dairy farms now have transferred to nursery in a lot of places too. And so they...how...you talked about Kent State and you talk about...

PW: No, no. Kent, Ohio.

LL: I mean Kent, Ohio.

PW: That's where headquarters...well, Kent State is there but Kent, Ohio is the headquarters of the Davey Tree Expert, who along with Alpine, which is headquartered here in Connecticut, and Bartletts. Those are sort of the tree big tree expert groups.

LL: How did Connecticut then as...as agriculture moved west and so many of the land grant schools out west began doing more research, how has Connecticut maintained its...other than its great reputation in existing scientific core...How do we fit within the other parts of the country who are doing research like this?

PW: Well, they're all kinds of. mechanisms for coordination and so forth of the research of the Experiment Stations in the U.S. Department of Agriculture. The beginning here at the Experiment Station is to work on problems that the State of Connecticut, through its Legislature appreciates our working on. So, they will continue to support us and be at the forefront of science. Although we are location specific, as I've said, or place oriented, a phrase in the new national cat...publication on sustainability, We're place oriented. To satisfy our ambitions, we must also be at the forefront of science That combination has served both the state well and has served science well I think. It's...it's not easy. No fulfilling...no ambition is easy by any...we've done it.

LL: A few years ago there was a bill in to...well, the Experiment Station was in danger of being eliminated. What do you think prompted that and how did it go about being preserved? I know some people who worked on it from...from ano...not from UConn but other places and from UConn actually.

PW: Um hm. Yeah, yes. Well, it probably goes back to our stubbornness in retaining our name.

LL: That's interesting.

PW: And of course, if you study the economic facts of life in Connecticut, you know that agriculture is important but it isn't preeminent by any means, But, because we are first Agricultural Experiment Station in the New World, we have stubbornly stuck by our name, Although, as I told you earlier, probably the biggest single specialty here right now is medical entomology because of the importance of ticks and mosquitoes in what is a suburban forest. But as I said, because we are the first, we stubbornly stick with the name Connecticut Agricultural Experiment Station. And that, if you don't know exactly what we do, that can be misleading. So it was...it just seemed like you know, this was something that very low people in the state would be interested in because agriculture doesn't occupy a lot of people. So in the budgetary process, they thought it would be a place to save money. Well, it was just an educational effort amongst those who did not understand who we were and then an outcry from those who did understand who we are. That's a democratic government, with a small "d" and the will of the people was heard and prevailed.

LL: Actually, it probably was very good. It gave an opportunity for...

PW: It's like a heart transplant. Very good one. (Laughter)

LL: It raised the profile for...

PW: It certainly did. Well, you know, when you got a place that's---in Lyme Disease research that our scientists do, when you get a place that beats out, Pasteur Institute and other places in detecting that this is the West Nile virus here in Connecticut, it's a jewel that people want to have continue and operate.

LL: Over the years that you were the Director then, for fifteen years, what do you think brought you the greatest satisfaction? Did you continue to do research while you were Director? Were you able to do that?

PW: Yes.

LL: So you didn't have to give it up?

PW: It would have been easier to. I think the...it's the great things that are accomplished in our...the Frink...Charles Frink, the leader of our soils research at the time I was Director. A man whom I've mentioned to you earlier because of his role in the Century Farms Awards. He and a colleague wrote a paper on acid rain that corrected some mistakes and that has become one of the most highly cited scientific articles in, in the literature. That certainly gave me great satisfaction.

The head of our Entomology Department, who was a very young man when I became Director, he just became the head of the Entomology Department there. He continued to develop a program that was just a world beater. He is now the present Director. To see that develop, to see this, discovery of this fungus that took care of the gypsy moth that had been such a scourge to people, those are the great satisfactions. And we...because...It's not a one time thing, but a continuing thing, because the Experiment Station is a separate agency of the state, we report

annually to the Environment Committee of the Legislature. It's always a thrill to go up there and tell them what we've done. I think we always get a good response and their appreciation of what we do. So that was an annual pleasure.

LL: What do you think was your biggest challenge?

PW: Biggest challenge? Maintaining the place orientation of the Experiment Station. There is never enough money to do what, you know, to do and take care of...to exploit the opportunities in research. So, money's a continual problem and increasingly, American science has been financed by grants. And, the people awarding the grants quite properly look at the scientific quality but there's no criterion for place orientation. So to maintain the very best scientific quality with the additional criterion of place orientation, so there's a connection between the Experiment Station and the environment and the people of Connecticut, that is the biggest challenge.

LL: What is Coldspring Harbor?

PW: Oh, Coldspring Harbor is a laboratory over on Long Island. In the early years of this century there was a scientist over there by the name of Schull. He had inbred and had crossed some corn so he was really the first guy who made a cross. And Jones contribution was to show how to...to make it work practically. Schull did not...carry on with it. Coldspring Harbor is an excellent laboratory. It's a private foundation. Jim Watson, the man who...the double helix guy, I think is the Director of it at the present time. Barbara McClintock who worked on corn over there for many years was a Nobel Laureate certainly made the place shine. It's a...it's an excellent laboratory over on Long Island.

LL: When did the facility in Windsor become...?

PW: As I told you, the...the Experiment Station ran the experiments that supported the entrepreneurs who changed the...began to grow shade tobacco here in Connecticut. The tobacco growers later...there...you know, I'm sorry I'm not going to be as precise on this as I ought to be, but later the tobacco growers turned up some problems. I don't remember what they were at this moment. So, they gave some land and the Experiment Station put up a little building up there probably around 1925 to 30. I could look this up but I don't have it off the top of my head. So it...its origin was in a collaboration between the station and the tobacco growers. It...it is now called the Valley Laboratory because, the range of problems up there are far broader than is...the range is far broader than tobacco alone. The nursery industry is pretty close and dependent and uses that laboratory as well as the tobacco growers. And some of our entomologists are stationed there who work with the nursery industry.

LL: And when did this...

PW: Oh, and the...and the present head of the Valley Laboratory, Mark McClure, is the world authority on the woolly adelgid.

LL: How did the...how did this facility evolve? I mean, if it was part of Yale to begin with...?

PW: No, it was never...it was a child of Yale in the sense that..., I think it was two years they were in the ju...in what is now called Judd Hall If you go up there and go in the front door, you'll see a plaque that says so. They came down and were in Yale buildings because the then Director, after the first two years, was Samuel Johnson and sort of the grandfather of all the Experiment Stations. Around 18...in the 1880's the board of control of the Experiment Station bought this property and put up the first building which is now the library, the Victorian building out here.

LL: Oh, yes. Okay

PW: And then the other buildings have been put up through the centuries. This is...this one was built in 1959. That's how we got here. Oh, and while we on that physical facilities, early in the, twentieth century, because by the time people listen to this it's going to be the twenty-first century, so it won't be this century then. The Experiment Station wanted more than just the grounds here to experiment on. So they bought...the Board of Control bought a farm in the Mount Carmel district of Hamden that is named for a man who was a benefactor and whose money actually was used to buy the farm. That's not a state property', that's an Experiment Station property out in Mount Carmel. Of course, the most famous thing that was done there was the invention of the hybrid corn.

LL: That was the...what you called the Lockwood Farm.

PW: That's right...

(End of side one.)

That's the gentleman's name who name people give to the Experiment Station.

LL: What was some of the controversies that had to be dealt with when you're in the scientific community? Or things that may have evolved in Connecticut through any of the research?

PW: Oh, I think the biggest controversy had to do with the gypsy moth. This was a running crisis.

LL: It was a horrible thing.

PW: In the '50' and '60's because you...we were at the...

(Tape interruption.)

LL: I think the tape ran out just about the time you were talking about the difference between what the foresters wanted to do with the trees and what the consumer public...

PW: Well, no there were really three interested parties. The foresters who were concerned about the death of trees and the U.S. Department of Agriculture who had a...had a control program in aerial bombing, if you will, for the gypsy moth. Both the foresters and their colleagues in the Department of Agriculture thought it made sense to spray to preserve the forest because if you saw the defoliation that would occur here in June each year, it was...it was awesome. If you could fly over the place with an airplane and spray it and stop this, it seemed the reasonable thing to do. The second group in this was probably just...although it's not an economic interest, it was a public interest and. They didn't like to have their neighborhood look like the moon in June.

LL: And it was very slippery to walk.

PW: It could even get that bad, it was not pleasant to have the frass as they call it, the droppings of the gypsy moth dropping on your patio. People were infuriated by this when they knew there was a cure for it which was you could kill them with a...with spray. The third group were a combination of people who really felt the sprays might be a health hazard. And, also people who probably didn't think it was going to hurt their health but (who didn't) didn't think that it was sort of ecologically sound to interfere to such an extent in the environment as to remove one of the constituents, namely the gypsy moth, and anything else...any other

lepidoptera moth that was susceptible to the same spray. Well, these were...these were bitter, bitter fights and the solution was a rare biologic control that really worked. There are some. Many of them are. .are touted as the answer to a prayer but in fact, don't work very well but this one worked like a...like a miracle.

Sometimes you don't know if that...that new thing is going to have a problem of its own in the future which becomes potentially...

LL: Well, I think...yeah, yeah, that's always possible but you can't be paralyzed all, you know.

PW: Now you based it in...when?

PW: In the early '70's there was another insect called the elmspan worm. It was so bad that it ate up the food before the gypsy moths could get there. And the Experiment Station found a wasp that controlled that. We did not introduce it but we found it and one of the...Bragging about that was one of the joys of my first years as Director.

LL: What about the elm trees in Connecticut?

PW: Well...

LL: That was national wasn't it?

PW: That was national, actually started in Ohio. There was an embargo...quarantine against plants...living plants that might carry that fungus. It was known in the Netherlands. There was a saw mill as I recall, in Ohio that was importing logs. Dead, logs are dead. But these logs were carrying beetles and so that started an epidemic of Dutch elm disease. That's where the name came from of course. And although elm trees are just as beautiful in Illinois as they are here, Connecticut was really famous for its elms. This is the Elm City that you're in right now. Yeah, that's the...and it's still called "The Elm City." Bridgeport is the Park City and New Haven is the Elm City. The green was completely shaded by elm trees, the New Haven green. The streets were cathedrals of elms. So when that struck in the '30's, the...since this is the place oriented station, we tackled it and the route...the unique route, and it really was unique at the time, that the Experiment Station took, and obviously it was unsuccessful, but it was a good idea nevertheless, was so-called "chemotherapy." Most fungal diseases, and Dutch elm disease is a fungus inserted into the...circulatory system of the elm tree by a beetle. Then the fungus grows in the circulatory system of the elm tree and kills it. Well, most plant diseases are controlled by fungicides that you spray on, the potatoes, say, and then when the disease organism arrives, it's killed. So that controls the disease. Well, the Dutch elm disease was carried by a beetle, it was inserted into the inside...(Tape interruption.)

LL: You were talking about the elm disease and the fact that the beetle brought it to the internal...

PW: That's right. So...so that the plant pathologists here at the Experiment Station who were lead by James Horsfall, who had invented the first sort of you know, devised...developed the first organic fungicide. Everything before that had been coppers and leads and so forth. Well, Horsfall...he liked to tell it but his daughter had had some infection on her scalp and they had used sulfa and it had cured it. In 1940 or so. And so he said, "There's got to be something like that for plant diseases." And he went to work on it. It probably was some fungal scalp disease you know. So he was, to say the least, high on organic compounds. So he said, "Well, let's put the fungicide into the tree and instead of protecting it with a barrier of chemical, let's cure it." Hence the word chemotherapy. Well, they worked for years trying to find a chemotherapy. They were not successful. There is one, a very important one today but we didn't get it. DuPont beat us.

LL: Oh, Now this is something else. I'm glad you mentioned that. I want to make a point about the orchards too but when...when things are discovered then there is a market for them and then like does it...does it get sold to Monsanto or duPont or does it...?

PW: Well, that has changed over the years. At the time these first... fungicides were developed here, they were developed in collaboration with other people. So the, patent actually went to someone else. One of the early...Horsfall's early fungicides you know, he was sort of doing what you would have considered the fundamental research. The other people were maybe hiring a couple people here at the Experiment Station or making a contribution to the station but it was done as a partnership. The rule was that the Experiment Station would publish the results for the world to read and that was our responsibility. Not the patenting. Now that's...the first change to that came in around 19...in the 1960's. Jones and Manglesdorp, the two fellows who invented the way of making hybrid com without detasseling, just that. The male sterility thing. They said, the Experiment Station and we personally are not getting anything out of these discoveries, They made the unprecedented, unheard of move of patenting a biological development. They assigned the patent rights to an organization that was accustomed to this line of work. They had never done anything in biology before but a man by the name of Cottrell who is a Professor at...in the early years of the century had invented the Cottrell Collector, that big thing outside of a factory that collects the dust. Well, that's a Cottrell Collector. And he had assigned his patent to...to an organization that he set up called the Research Foundation. So these two men, sort of to the embarrassment of the Director then, 'cause he'd never seen anything like this before. They went to the Research Foundation and the Research Foundation said, "We'll fight it for you." And so over a period of...gee, I don't know, ten years or so, probably longer than that, this thing was fought out in the courts. And finally the courts said, Sure you can patent something like this. So the...these two men and Harvard University, this fellow Manglesdorp had moved onto Harvard, Professor of Botany up there, and the Experiment Station were the beneficiaries of the royalties that came in. Now, they don't come in anymore because the great com blight epidemic of 1970 put an end to the use of this male sterility. A fungus came in and attacked this...all the com that had this male sterility factor. By that time that was all American com practically. So that...that's out so that the royalties don't come in anymore but the Experiment Station got you know, a few hundred thousand dollars and spent part of it to renovate our Jones Auditorium.

LL: Oh yes. Now, does this set the precedent for the new raised things that are done with researchers? I mean, this has changed.

PW: Well, it...it...you bet. And this is not peculiar to the Experiment Station.

LL: No, that's right.

PW: This is a national...

LL: I know...do you know Fl...Gatorade is one of the original issues with that cam...

PW: Well, we've never had a winner like of course, the...the...the...probably the most famous one was Carl Paul Links of discovery of Dicouminal which was assigned to the Wisconsin Alumni Research Foundation at Madison and they made bags of money. Of course, they have...

LL: I don't know Dicouminal.

PW: That's...you would if you had a heart attack.

LL: Oh, all right.

PW: Yeah, and it's also used as a rat poison because it makes the rats bleed internally and it's called Warfarin for the Wisconsin Alumni Research Foundation.

LL: Oh, Warfarin is...is...

PW: Dicouminal, yeah.

LL: But there is...is...is the blood thinner.

PW: That's right.

LL: It's a different...I...

PW: It's the same thing. It was...he found it...that's...that's a Wisconsin story.

LL: Okay, okay. All right. I...just briefly I'd like to talk about the orchards. Something...I was talking to someone who had talked about the locusts, the seventeen year locust. And how...

PW: It only happens every seventeen years. (Laughter)

LL: But...right, but they had I mean, that...and this to me was fascinating 'cause again I'm not any kind of a botany scientist. But that...the fact is that you don't know it's happening until it's too late, almost.

PW: Yeah, yeah.

LL: Until it's attacked your orchards.

PW: Yeah, well, they know what's coming. They know what's going to...if you want to talk about that I can you know send you to an expert on it.

LL: But there's another way of treating it though. They...they can treat it now.

PW: I don't know. I'd have to send you to Chris Meyer. He knows all the ins and outs of the seventeen year locust.

LL: Okay. All right, okay. Yeah.

PW: It was...I think it was, was it five years or so ago that it was...was an outbreak of it. Yeah.

LL: I noticed when I went through the Pomologic Society...hundred year history of Pomologic Society that a lot of orchards had come in, in the '60's. There seem to be an unusual amount of the people who had agreed to be in this history, hundred year history. But there were a lot of them that came in in the '60's.

PW: Well, you know, we're not going to begin to discuss all the things that have happened in Connecticut agriculture but we...we can try. One of the great changes that has happened is in horticulture, both the apples and the vegetables, sweet com. About probably 1960 or so, lead...and probably really I could...well, there are a number of them and certainly Robert Josephi whose this plaque that you see on the wall here was one of the moving forces. They said, "We're going to die if we just take our apples down to the markets," You know, the regional markets, and put them there and let the grocery stores come in and buy them. So the first step they took was they...a group of them sort of split up the grocery stores regionally. They arranged so there would be a direct connection between a given orchard and a given store. So it became the responsibility of that orchard to see that IGA store or something like that had good apples. Now

of course, the regular open market went on at the same time so it was no monopoly problem or anything like that.

But it did get the farmers a little bit closer to the consumer. Then who knows? In the '70's, something like that, this development that seems so obvious in hindsight was thought as quite novel at the time, direct marketing began. And it really began as sort of roadside stands. And Bob Josephi being in a suburb of Danbury would have been...he was one of the most active people to sort of begin to sell retail. And if he sold at retail, then he really needed more than just apples. So he grew some other things and had a few chickens. The real big thing that made it work, though, was so-called "controlled atmosphere storage" which allows you to store the apples and have them in prime condition through a longer season, so that you didn't...you weren't just selling apples in October. You could sell apples all the way. to April. Direct marketing became the way you could make a living. That would have been one reason that you saw many new faces in the 1960's. Then through the '70's and into the '80's, you had to grow those pick-your-own. And once again you know, it's like the shopping cart that revolutionized marketing, this pick-your-own has revolutionized Connecticut horticulture. Whether it's you know, Rose's...did you go to Rose's Berry Farm?

LL: Um hmm.

PW: ---that's an example. But there are...there are many of them in this state, yeah. And that...the basic problem in Connecticut agriculture is finding a crop that will pay the rent on expensive land and make a living for a family that doesn't make the money to live in the neighborhood because they're impoverished. In other words, to try to make a living comparable to that of your community and do it on expensive land. How do you...what's the crop going to be? And pick-your-own and horticulture and, although it's not retailing, nurserying and tobacco. These are all crops that will yield enough per acre that can pay the rent. Of course,...in the early '70's, it was a group of us led by...inspired by Bob Josephi really, to get the state to purchase development rights. In about 1970, Governor Dempsey, inspired by his Commissioner of Agriculture and Natural Resources, Joe Gill, set up a Governor's Committee on Environmental Policy. It was Chaired by James Horsfall, the man who we spoke of. On that committee was Bob Josephi. The Governor's Committee which was very big because it was a very prestigious committee to be on and then people wanted to be on and were on. It was divided into task forces and one of them was on agriculture. And...and the things that I've just said about farming in Connecticut were all evident to these people One thing that they thought of...no they didn't. They just said, "Something has to be done." So after the...after the committee adjourned or put out its report, and it was my great good fortune to be in on that, Bob Josephi gave an address at our annual field day. It was subsequently published in the New York Times, and all that, about the possibility of buying development rights and what was going to be done about the preservation of agricultural land in the suburbs. And so Bob, although a devout Democrat, succeeded because of the good offices of a man by the name of Charlie Straub, statesman on the other side of the aisle, who succeeded in getting Governor Meskill to appoint a committee, a task force it was called, and once again I was lucky to be on that.

Our chief recommendation was you know, one tangible thing because there are other things you could do. The...the...the tax program that I'm sure you're familiar with was already operating. It was obvious that wasn't enough. So that the new thing that was proposed was the purchase of development rights. It was taken to the Legislature, the Legislature said, study it some more. So the task force commissioned a survey. In part members of it performed the survey, "would farmers really sell development rights?" Would it be good land and so the...There is an Experiment Station Bulletin reporting the results of this survey It looked like it would fly and then I don't know, it may have taken two years. Finally the Legislature established the Development Rights Program There were very good s policies laid down about which land would be purchased and so forth, by people who worked at this very hard. One of them, Irving Fellowes from UConn who had had experience with the tax program, and I was on it. And there was a great guy who was the President of the University of Hartford, he understood agriculture, set down the general policy that you'll want to get the best soil. So to a remarkable extent

although this program is now you know, twenty years old, you'll find that most of the land that has been purchased is pretty good farm land. There's not much just you know, saving land but it's good farm land. I think it's twenty-five thousand acres or something like that. The Department of Agriculture has a person who...

LL: They haven't had as much success in recent years getting the funding through the Bonding Commission.

PW: What's new? It wasn't easy to get when it started in the first place. It isn't easy to do anything, (Laughter)

LL: Good point, good point. I have...is there anything else that you'd like to talk about related to your own career here or with the Experiment Station?

PW: It's been a pleasure.

LL: Oh, wonderful. I was going to ask, you know, in your whole lifestyle did you ever envision this was the kind of career you were going to have?

PW: Yeah. I...I've always, you know, been intrigued by science, numbers love statistics and love to experiment, love to garden and so on and so forth. So I have that side. You know, I can look back on it and I can remem...realize when I was kid I was always doing strange...trying things that no one else would have tried. So...but I couldn't be more surprised that I'm in Connecticut.

LL: Except that this is what the...the Experiment Station's reputation.

PW: Yes, sure. It drew me. Drew me.

LL: What... what about your association with people from other parts of...of the country? As Director of the Experiment Station then you were cast into an arena of...of like people.

PW: No, the... not very. The other...there is no other Experiment Station that has the concentration on research that we do.

LL: I unders...oh, I can see that, sure. Yeah, because of all the rest...isn't there one other state that has two Experiment Stations?

PW: Oh, yes. There were both Ohio and...and New York State, but they're not really sep...they're in separate locations and I'm sure there's a different emphasis in Worcester than in Columbus or in Geneva than in Ithaca. Those are the two. But our whole you know, instead of reporting to a college president, the Experiment Station reports to the Board of Control and reports to the Legislature. So it's a different world.

LL: Now do you do...but you do do outreach education now too?

PW: We answer questions when people bring things to us, we sure do. I will...you know, we will look at your sample and see what it is. And of course, the trapping of insects and so forth all over the state is...but that's the foundation of our research as...as well as being a public service. Sure.

LL: So because you're...you're not part of the land grant system, where all the...that doesn't...you didn't necessarily get involved with all the land grant Experiment Station stuff?

PW: Oh, oh, oh. With the Experiment Station stuff, absolutely.

LL: Yeah, okay.

PW: But not with the land grant stuff. That really was no you know, we don't have a basketball team. (Laughter)

LL: I want to thank you very', very much.

(Tape interruption.)

We are talking again about the environmental...well, we're talking about Commissioner Gill and his...his interest basically?

PW: Well, yes.

LL: ...in environment is what he saw...he saw this on the horizon?

PW: Joe was...wasn't you know, he wasn't...

LL: He'd been an attorney?

PW: We wouldn't have called him a...an environmental activist. He was a statesman. And he had had...he had im...he was improbably sort of thought of as a chicken farmer from Mansfield/Willimantic region. But in fact, he was educated as an attorney and he was a big man you know. It really...public servant He was active in Governor Ribicoff's campaign and when the...when Ribicoff was elected Governor, Joe was made Commissioner of Agriculture. He did such a super job at that that...that Governor Ribicoff gave him responsibility for what was then the Park and Forest Commission which supervised the parks and the forests of the state and of course, also was he responsible for the aquaculture. Fleet of one ship in Milford so (chuckle)...and Joe was... I remember you know, he was sort of the leader of the delegation that I accompanied to go to Ladybird's National Conference on the Environment which was organized by then Secretary of the Interior, Udall. And so Joe...Joe was...was a leader, he was a statesman, he saw that there was much more to be done about environmental matters. His foundation of course, in farming was natural and for a person to become interested about the environment. So he and the Director of the Experiment Station, James Horsfall, were very close. The Commissioner, of Agriculture is a member of the Board of Control of the Experiment Station He and Horsfall, who had become very aware of each others capacities. So in Governor Dempsey's administration, Joe as the Commissioner of Agriculture and Natural Resources, went to the Governor...Governor Dempsey, proposed the statewide really examination of how environmental matters were handled in Connecticut. I'm sure because of Commissioner Gill's recommendation, the Director of the Experiment Station James Horsfall was made the Chairman of this Environmental Policy Committee and produced a super report encompassing all the concerns of agriculture, forestry, entomology, education, waste disposal, tower, everything. And it's a super report that you can get a copy of in the State Archives. It was published in 1971, probably. And that was Joe's...and in the Legislature subsequently, the Department of Environmental Protection was established which took in all of these new things, regulatory matters, plus the management of the parks and forests. Agriculture continued to oversee commercial agriculture but these other environmental things and then of course, they grew like topsy, were all in a... in the Department of Environmental Protection. The first Commissioner of whom was Dan Lufkin who was a Wall Street Environmentalist and did a super job of getting it going.

LL: Now was...within the last few years there have been suggestions that the Department of Agriculture be folded into the Department of Environmental Protection. Have you watched any of this as it's evolved?

PW: Not really. There you know, I don't think you know...on

LL: It doesn't go very far but it's been there have been two different years it was up as an introduced bill.

PW: Since my retirement, it's obvious you're following these things more closely than I am.

Yes. I probably won't after another six months, right? Thank you for adding that very, very much.

PW: You bet.

(End of Interview)