

Sumner Williams  
June 29, 1988

Mary Kasamatsu  
Interviewer

MK This is an interview with Sumner Williams at the Proctor Maple Research Center in Underhill, Vermont from June 29, 1988. This is a place, a facility owned by UVM.

SW That's correct. Yea, it's actually, we're out of the Botany Department at the University of Vermont and there are two programs within the maple program out of the Botany Department and the one here is the Proctor Maple Research Center and the other is the Maple Lab on Campus in the Marshall Arts Science Building that's run by the Dr. Morselli. And the two sort of compliment each other in that if we do an experiment up here and we need to know something about the chemistry of the sap and the syrup that we're working with, it gets sent down to the lab. We have a lot of work study students that work down at the lab and will come up here and collect leaves or branches or sap samples. So it's a two part program, but it's all the maple program and it's under the Botany Department at the University through the Agricultural School.

MK Right, Okay.

SW Uh huh.

MK What does this facility consist of, what's here?

SW Well it consists of somewhere around 200 acres of, huh, multi purpose land. Um, when this was bought back in '46, it was Governor Mortimer Proctor bequest some of his own personal money in the form of a grant to the University for the purchase of a sugar bush, expressly for maple research. And at the time, Dr. Jim Marvin and Dr. Fred Taylor were working out of the Botany Department and they were already working with sugar maples at the time up in this area, up in the Chittenden County area. And when this money became available, they started scouting around and they found what is known as the Harvey Farm. And the original buildings to the Harvey Farm are down in the lower field and the old foundations are still there. But when they first started coming up here and had this as a field station, they based their operation um, out of the farm house down in the field and then slowed their way up here to the sugar bush. And then in, um, let's see, '47 or late in '46, they decided it was too much trouble driving back and forth and collecting all the data and hauling it down there, they built that small red shack there. And that was the original laboratory.

MK That is tiny?

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SW Yea, it was and there's lots of good stories of, you know that was just crammed full of instrumentation. And this was a working sugar bush at the time. Um, and the actual sugaring operation was contracted out to one of the local farmers and he would come up and gather and do the boiling up here and then the syrup was sold and the profits came back to the Research Center which is still done. All the syrup that we produce here is sold at the Book Store on Campus and the money comes right back here to the Research Project. Then early in '48 or '49, they they tore down the old sugar house which was up above in the woods and built the what we now call the old sugar house. And then this garage was built and then in '64 with funding from General Foods, the laboratory was built and then um, in '67 the Annex was added on to the Laboratory. And we um, have about 45 acres of sugar bush here and then the rest of the land is mixed, mostly hardwoods, some soft woods and um, probably 15 acres of it is open field, but primarily it's it's sugar maple and...it's a nice chunk of land.

MK Yea.

SW Nice chunk of land.

MK Beautiful place.

SW Yea, yea, we're we're far enough away from, from Burlington that it's quite nice.

MK Yea.

SW And yet not too far. Although it sometimes is a problem because we like to get more students here, but it's, it's kind of a haul for them to come out, you know just to come out for an hour or two hours you know, but if we can get them out work study students or or classes for the whole day, that seems to work out quite nicely.

MK Yea. What kinds of research, I mean obviously maple research, but what kinds of things have, has this facility looked at and what are you looking at now?

SW Uh huh. When Marvin and Taylor started up here, they were um, concerned um, with the resource, studying the maple tree itself and understanding um, why one tree is, or trying to understand, nobody does to this date that I know of, understand why one tree is sweeter than the other and/or not totally understood. There are some given bits of information that they have found out, but um, understanding sap flow, how it moves, um, when the

starches turn to sugar, um, all those related areas of um, understanding the resource, understanding the tree and how it works. And um, then Fred Tay, Fred Marv, Fred Laing started working up here um, as a, I guess he was, he was a technician and then as Taylor left and Marvin retired, Fred Laing took over and quite a bit of the research went from the basic research of the, of the resource itself, to applied research and looking at maple tubing systems, efficiencies of evaporators, vacuum pumps, parafameldihide(SP) pellets. Fred's worked on a long time project trying to correlate tree growth to sugar sweetness and we've got, you might have noticed that a number of these trees have have numbers on them and there's somewhere around 7 or 8,000 trees that we have a history on where we measure sugar content and tree growth and trying to make a correlation between the two. And the, I think, and so the focus went from sort of basic research to more applied research although there was basic research going on and now we're shifting back towards basic research with Dr. Tyree who has taken over the maple program. Fred Laing has retired and Dr. MariaFranca Morselli from the Maple Lab has retired and Dr. Tyree has come in and he's going to head up the maple program, both, both aspects of it. And very possibly the two will be pulled closer together and if we get the facility that we're hoping that we'll get, they'll be centered up here. And they'll maintain offices on campus and probably one laboratory, but the bulk of the work will be done up here. But Dr. Tyree is a, a tree physiologist and his focus is is on again the resource, but he would like to continue in the applied research area also. So we hope that we'll have a, a real strong basic research program and a good applied research program and we plan to build a new sugar house and continue sugaring and hopefully testing of equipment, sugaring equipment and doing a lot of extension work, passing on information that we, that the scientists gather here out to the, to the sugaring community.

MK Let's talk briefly about the structure that burned, the lab that burned. When exactly was the fire?

SW It was February 19th and it happened at at night, nobody was here, nobody was hurt. And it, by the time it was noticed by a neighbor across the valley, the building was pretty well consumed. And when the first fire truck got up here, they said that the whole roof was already down and so by enlarge everything was lost in the laboratory. And the first pumper truck that came up, they, because we had a good strong southwest wind blowing, it was blowing it, the fire away from the Annex or the sugar house where we, where we were doing the boiling for the last 13 years.

And the first pumper truck that came up, they went in through the garage and pushed the fire back, so that part of the building was partially saved. There is quite a bit of damage in there and I think we'll eventually end up taking that down and, but planning to build a new, a new sugar house. But the fire was reported at 8:40 in the evening and I got up here at 9:30 and when I got here, even the walls were down by them. So, and it was just such a, you know it's such a remote spot here, that it wasn't noticed and we didn't have any fire detection system. And so really the only thing that the fire crew could do, which they did very well, was to save the Annex and to, you know just to contain the, the building and sort of mopping up. (TELEPHONE RINGING) So it was pretty much a total loss as far as the laboratory goes.

MK Do you need to get the phone?

SW No, no it'll answer at the sugar house, thank you.

MK Okay. What, did you have a lot of the research contained within the lab or were you storing the results of the experiments in another place?

SW Well, how best to answer that. There was some some misconception that we lost all our data. And a lot of it wasn't lost. A lot of it is stored in these two big trailers here. And a lot of the old data. But what we did lose was recent data, projects that we've been working on for the last two years specifically. The ones that are current and are bringing in the money right now, those all the information was on the computers and you know in the process of being analyzed and you know in the backs of our minds saying you know, we should back this information up you know just so we have copies of it somewhere else and the kind of thing well maybe we'll do that tomorrow. And so consequently all that work was lost and that, that was one of the hardest pills to swallow. Then there was a lot of reference data. There were probably you know four, four drawer file cabinets just full of old publications and not things that can't be reproduced you know, there in libraries somewhere, but just you know we had it here and we knew where it was and it was organized, semi-organized I should say. And that was a lot of Fred Laing's work. Of course most of the, most of the research projects that we'd done in the past, you know, there have been publications and papers written, so the information is already, um, condensed into a, you know, a decent publication. But to have all of the, some of the, I shouldn't say all of it, but a lot of the background information, that was lost. Computer equipment, you know

\$100,000 plus probably worth of computers and components and then all our hand tools and you know all the furniture and the stuff. There was a little bit of history. Most of the history stuff that we had been working on had been taken down to the Archives on Campus or it's in the, in one of the storage trailers. So we didn't lose a great deal there.

MK What kind of history stuff do you mean?

SW Well, uh, photographs. That was one, another big loss, was all our slides. You know, we had thousands of slides of, you know all the experiments that have gone on up here and other people's sugar bushes and going to you know maple functions and pictures of trees in different you know stages of foliage or just all kinds of things, insects and you know all those things that you use for slide shows, all of those were lost.

MK Thousands of work hours.

SW Yea, really, yea, yea, many thousands of hours. And although we're finding that a lot of people had copies of of a number of the slides so we've you know talked to a lot of people who have said, well you know we have copies of this and this and this and so when we do get going again, one of the tasks that I think I'll probably have is to get in touch with all these people and see what they have and make copies and start rebuilding our file. You know already I'm out almost daily with the camera taking pictures and anything that we see that you know we think might be of help in a, in a talk show or something, we take a picture of it. So, and I think that's really all that you know, all those little, all the little things that, you know it's been a real headache to put together a inventory of everything that was lost and we, we, each of us as we were going through the rubble and you know remembering, we all wrote down lists and then we sat down and compiled one big list and then we entered everything on the computer and we think we got a pretty good idea of you know everything that we lost, but you know it seems like every few days somebody will say, well didn't we have this or didn't we have that and so then we have to add that to the list and then there's the, the process of reordering it all you know, because the insurance covers it. So it's meant a lot of, lot of extra hours that we would like to be putting in on research rather than you know thumbing around, getting prices and sending out purchase orders and, and all of that.

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MK Have you been able to continue the research you were working on?

SW Yea, yea. One of the projects that, that we had going was Dr. Tyree was working on a computer model of, of how a tree moves sap or or water through it and Tim Wilmont, a research technician up here had a tree down in the lower field that we built scaffolding around and all summer they monitored the tree and they monitored the weather around the tree and temperatures and things like that, took specification information and then in the fall, we cut the tree down and only we cut it in in parts. We took a branch at a time. Brought it up here, cut each branch into about six inch segments and removed all the leaves and counted all the leaves. We had a device that you lay the leaves on and run it through a sort of a belt mechanism and it automatically gives you this square area of all those leaves. But we had to, you know, physically remove all the leaves. And the idea was to, to map the tree and then to build a computer model, to analyze the data and to build a computer model and that's what Tim and Dr. Tyree were working on. And countless hours of information that you know were in the computer and getting close to the point where something concrete was going to be done and and then the fire. So, Tim is now down there. He's got another tree. And we've got scaffolding and he's down there doing dusk to dawn readings and they've expanded the project a little bit. And of course, a lot of that project there was a lot of you know backing and filling you know, going down this road and whoop, that's a mistake you know we don't want to do that, so backing up. So now you know we know that those roads are one ways and so we don't want to go down there. So you know, we've learned a lot. But still there's a lot of hours of data collection again, but and you know working on the program, but certainly Dr. Tyree has in his mind you know what he did and it's just going to mean hours of rewriting the program. But, and you know, there will probably be changes for the good that will make it easier this time, but it's still going to be a one heck of a process. So we've got (TELEPHONE RINGING) two trees down there now with scaffolding around it and a couple of different things going on. And that's, that was the big project at the time that we were working on. He was working on some other, um, (PHONE RINGING) sort of, huh, can't think of the word, um state of the art equipment that he's you know designed in his head that he thinks would help us in measuring trees responses or and he's already been successful at at actually planning and designing and building and patenting devices that do different things. Stress monitors that will, the tree will give out an

impulse when it's stressed by drought or something like that and he has a a drought stress monitor that, that he was very influential in, in thinking up and designing and building and so he was working on some devices, doing things like that and those were lost. But the sugaring operation continued and we were able to pull the odd ball stuff out of the old sugar house where the, where what was the new sugar house and take it up to the old sugar house and so we were able to sugar this year and carry on that way. We felt that we, we needed it psychologically and also we needed to show the maple community that we, you know, were pretty tough and were going to hang in there and continue sugaring and that's something that Dr. Tyree has wanted to do also with this, with the, you know, things have changed so in that you know the size of the projects that we want to take on and the added number of scientists that we would like to have up here working on the, on the, the problems that are facing the, not only the maple community, but the whole forest community, because the work that we do on on hardwoods up here isn't, isn't just for sugar makers. It's, it's going to be for, I mean every fourth tree in the State of Vermont is a sugar maple they say and it's, you know, it's an important hard wood to us for many and various reasons and so to maintain its good health is beneficial to everybody and so Dr. Tyree and, is very committed to continuing you know the maple program up here, so that, that's going to be one of the focuses. But we hope to see some new faces and maybe some, the new laboratory we hope to have some small bunk rooms in it so visiting people, scientists could come up and work maybe for the summer on a specific project, have a place to stay and all kinds of plans. We have a lot of sort of pie in the sky plans and we're just waiting to hear about funding, so, but the, you know the fire, the fire took a lot and it took some of the wind out of our sails but as I say, nobody was hurt and everybody is still as committed to the maple program as they were before the fire and maybe even more so. And with the hope of getting added space here, that we'll be able to expand out projects and you know help the, help the whole forest in the State of Vermont and you know in New England for that matter.

MK You mentioned the stress monitor. Is that looking at acid rain conditions as well? Are there, do you have ways of looking at what is the stress from acid rain, what is the stress from drought and what is the stress from the thrips and?

SW Well I don't think we can categorize them that way. Dr. Tyree can or you know there are ways of looking at trees

and monitoring stress, but to say the stress is caused by ABC or XYZ, no we can't. But that's, that's the area that Dr. Tyree is, is heading towards right now, is with maple decline and hardwood decline, is understanding multiple stresses on the trees and we know that there are in the course of a year a tree can be affected by any of you know half a dozen different stresses and two weeks ago it might have been effects of the thrips which is an insect infestation and the drought that we were having and maybe the sugar maker is not managing his bush properly, extending too heavily or over tapping or too much mechanized equipment tearing up the ground and there you have three major stresses on the tree and those three stresses might be enough you know individually the tree will make a come back, but put together like that it's too much for the tree and it'll tip it over the line and it will decline and not come back. And you know there are, pollution is another one, you know commonly called acid rain and it's, that's sort of gotten to be the catch word, but I think that you know acid rain is a, is a bit of misnomer when it comes to talking about tree health because it's, because there's acid rain, and there's acid snow, there's acid fog and acid dew and all of those things and the moisture is, the pollution is in the air and you know it's spewed out of, out of the stacks and out of the, the exhaust pipes and, and it mixes with chemicals in the air and with moisture and is brought to the ground. And the moisture is partially a vehicle to bring it to the ground. But that stuff is still floating in the air and if you set up a, a filter with a you know a vacuum cleaner motor drawing air through it, you're going to pick up those particulates. So it's, we you know, we refer more to it as pollution or atmospheric deposition and I think it's widely felt that pollution is a stress factor on the trees. We have no scientific evidence of it, but there's a lot of circumstantial evidence that would lead us to believe that and you know there's quite a bit of scientific evidence about the effects of pollution on our streams and lakes and there's certainly visual effects of it to architecture and and now the health community is getting in on it and saying that there are very possible side effects you know to children. And if that doesn't bring some legislation to bear, I don't know what will. Because certainly you know we used to say well here, you know they hear about well the maple trees are dying in Vermont, you know what's a few maple trees. But when you talk about children becoming sick or or the elderly becoming sick from bi-products of acid rain that are a spin off from acid rain, then then people are going to take notice. But I think that, the sugar makers have been crying out for a long time. And at first it was, you know



we're losing our sugar bushes and this is going to decrease syrup production and that didn't seem to be doing it enough, you know making a loud enough noise. But then when people started realizing that in fact one out of every four trees is a sugar maple and if Vermont were to lose all its sugar maples, not only would it be devastating to the maple industry, but certainly to the tourist industry and just to the whole landscape of Vermont and if we didn't have our sugar maples, and it just, it would have such an unbelievable impact. And so I think now people are beginning to realize that and it's not just the sugar maples, it's all trees, it's all plant life that you know can be effected by pollution. So something's got to be done, but the wheels of politics turn extremely slowly and you know everybody is yelling more research, more research and I agree that there are areas where research needs to be done, but I also feel that you know we need to get some legislation in there somewhere and we need some new new politicians too. (LAUGHING) But that gets into a whole other area.

MK Yea.

SW I always have to watch what I say because I you know. I, you know I have, I have my personal feelings and I also am a representative of the University and I like to be careful about making any policy statements or anything that the University might check up on. (NOISE) The morning...

MK Yes. Wait til that goes by.

SW Okay. That's, that's Tim Wilmont. (HORN) The day after the fire when Dr. Tyree came up. We were all up here the night of the fire. And then of course we were back up here the next morning with the fire marshall and some of the volunteer fire department and that's when Dr. Tyree, that evening he had come up with the adopt a tree program and as I said we have about 7,000 or 8,000 trees that are numbered here that we've used for different experiments and his idea was to make the trees available for adoption and at a level of \$25.00, a person gets a certificate with the tree number on it and then at a \$100 level, the tree, they get a certificate with the tree number and there's a small plaque attached to the tree with their name. And then for people who donate over \$500, there is one tree that will have a plaque on it with with those peoples names or those companies names and then there will be a large plaque inside with those peoples names inside the new, the new facility with those folks names on it. And then there are some other, other donation levels that Dr.

Tyree had come up with. There were some gold pins for you know extremely large donations. And the program has gone quite well. We sent out three, three separate mailings. One to the, to the Sugar Makers Association in the State of Vermont and then one to the Vermont residents on the Vermont Life mailing list and then we sent out a mailing to the alumni of the agricultural school. And the response has been quite good. We've raised about 40, somewhere around \$41,000. But the, the monetary response has been very nice, but the public awareness I think that we've gotten from it has been great. There's been a lot of newspaper articles and there's been some television and radio coverage on the adopt a tree program. So it's, it's, it's been a good awareness program. It's been great PR. We've had, well the first one that we got that was a group of kids from I think Longneck, New Jersey who got together and they made leaf shaped cookies and sold them and they raised enough money to adopt two trees. And just recently the kids from the Worcester Elementary School had a project where they built bluebird houses and they sold those and raised money and came out, they actually came out here and brought two bluebird houses and they and also adopted a tree and so we set up the two bluebird houses. I've got one set up here and one is going to be down at the, at the acid rain site, and, but it was great to, the teacher took pictures and they were going to have an article in the local paper and all of this information we put together and sent to Dr. Coor and also to Governor Kunin and you know (PHONE RINGING) anybody else, so that they get an idea that there's quite a bit of public interest here. It's been very helpful, that kind of information going to them and just the numbers of people who have donated. It's been great. So...it's been a good program, it's been a good program and I think we've, I think we've adopted out about, well close to 300 trees now. And it has been fairly successful.

MK I guess so. It's a fairly short time too.

SW Yea, yup it is and we've been concerned that you know that if we don't, if we don't keep things going and don't you know people are going to forget. You know, when the fire happened, it was a, you know that first, the tragedy of it and that's the time to strike with programs like that. Unfortunately, so and actually our best response was right, right at the beginning. We're still getting a few, you know, I, I picked up the mail today for the last I guess it's been about a week now and there were probably ten responses. So it's pretty well, pretty well run its course. But we're always hopeful of you know some large

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donor coming in with some significant amounts of money and we'll see.

MK Do you have a time table for trying to raise the money by a certain date or?

SW No, not really. We, we had hoped to, we'd hoped to raise about \$50,000. And that that would be used to encourage the University to match X amount of dollars. What we hope is that, well what we want is to be, to have the facility as soon as possible because there are very pressing problems to the, to the forest today that need to be answered and um, you know, if if we, if we get Federal money it could be two or three years down the road before we have a facility and we need to do something before that so we're looking at trying to do this in a in a phase situation and build a small portion of the lab so we can have water and toilet facilities and and the basic necessities and to get going on some of the projects and then when the rest of the money comes in, continue the construction. The idea would be to you know break ground tomorrow and get going on this thing, but realistically that's not going to happen and we're hoping that possibly we might be able to break ground this fall. If we do go in a phase situation, there is a possibility of of some state money and University money, enough to just, to get the the building started and I think once we get it started you know, then then there's the commitment and the rest of it will be done. But there's just so much backing and filling you know and phone calls and whose doing what and you know whose monitoring what and, and again when you deal with with the Federal government and the State government you have to plan on waiting awhile because decisions have to be made and it's not one person making the decision. So we don't have a strict time table except to get something going as soon as possible and to get going on the research. And also by getting started on the research projects and you know being able to apply for more grants that will bring in more funding which um, will, will in the long run, you know, when you do get a grant, most times it's, you know, there's X amount of dollars for the scientist's time and there's X amount of dollars for overhead and for the purchase of equipment and so some of that money can go into the, into the building to house that equipment, so it all is kind of inter-related sort of like a domino thing and I think if we were to you know get a a serious commitment from the Federal government which looks pretty good, that we'll you know, things will start to fall into place.

MK Did you have some Federal contracts prior to the fire?

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SW Yes, Dr. Tyree has has some Federal money. A lot of our funding is is, well some of our funding is State funding, but most of it's grants that he's gone out and some of them are Federal. So and he's you know, he's an established grant writer and he's, I think he's going to be a real boom to the maple, the whole maple industry when this thing really gets going and he gets his feet on his ground and you know when he gets the administrative stuff out of the way and he can get back to being the scientist that he is and that he wants to be. It's difficult, but he's, he's a good leader and I think he'll, I think he's going to do good things and he's going to pull people together and um, I think write some significant grants that will bring in large amounts of money that will be used for research and help the State of Vermont, help the farmers and the and the sugar makers, so.

MK I'm going to go back to the history of, of the sugar industry a little bit. I was talking with an older sugar maker in Cal, no East Montpelier a little while ago and he talked about you know of course how it was different when he was a boy and the kinds of technologies that have changed and so on, but also he mentioned that you know it used to be mostly dairy farmers who did a large volume of the sugar making and that that's changing. I wanted to talk about that a little bit. Is that primarily changing? Is his observation correct do you think?

SW Oh yea, yea I think so and you know I think the, you know I think sugaring, excuse me. (PHONE RINGING)

MK Sure.

SW I think that the, you know the the history of sugaring goes way back a long way and there's a bit of a controversy over who, who started it, you know the Indians or the settlers. And, and or should I say native Americans. That's that's even controversy there, but anyway. I think that it's basically felt that the Indians discovered sugaring and they made observations, whether it was the sap suckers on the trees or the squirrels going after; I've seen squirrels run up a branch and nip on the branch all the way up and then turn around and come back and lick where they'd nipped the branch. And you know if you've ever taken an icicle from a sugar maple tree and just put the very tip of it on your tongue, it's very sweet. It gets concentrated right at the tip. And you know the old legend is that some Indian chief came back from hunting and threw his tomahawk in the tree. That night it was it was cold and he removed the tomahawk the next day and went off to hunt again or something and there

was a pot sitting under it with meat in it and the sap dripped into the pot and his wife boiled it down and that's how they discovered maple. And you know I think it was a little more involved than that, but the idea is that they were looking for something sweet and and I, so I think that you know the settlers and came along and they brought their iron pots and things changed. But they were also looking for the sweet also. And at that time you know syrup was just a probably a stage that they, that the, that the process went through because they took it right to sugar and because sugar is easy to you know to pack and to carry around. And so you know there was always this need for sugar. And the settlers you know came and settled the areas and had their farms and white sugar wasn't available at the time and so each farm had their sugar bush and then as white sugar became more available, probably maple took a bit of a decline there, but then, one of the largest consumers of maple back, I don't know 75 years ago or 100 years ago maybe, maybe not even that far back was the tobacco industry. And, um, you know, millions of pounds of it were used as a um, what's the word I want?

MK Curing?

SW Yea, but um, it's like, I want to say, a humidafacor. It was used to keep, to keep, you know, the tobacco moist. I can't think of the word and it was used as, also as a sweetener too for chewing tobacco. Of course chewing tobacco used to be really a big industry and people just don't chew and spit these days. So that, that kind of faded out and then I think the industry went into a slump again until you know, just maple syrup picked up and you know through promotions and everything that.

MK Now what are we talking about in terms of years, maple syrup coming into prominence?

SW Well you know maple syrup has been along, been there right along, but you know I think it primarily when the settlers had it they used it for sugar, but certainly they used it to, they probably had sugar on snow and they might have you know kept containers of it around for awhile. But I think, and then the maple industry, the tobacco industry would take it in as as syrup also. So ah, I guess I can't give you a real definitive um, chronological time span. Um, but I think that the the desire for maple syrup as we know it today has probably been in the last oh, I don't know, this is kind of a guesstimate, but probably 25 to 50 years, something like that, that there's been a real demand for maple syrup. And, um, ah and so the farmers

you know had these sugar bushes and they didn't need the sugar themselves so they just you know rather than taking it all the way to sugar they just kept it as syrup and sold it either to the tobacco industry or now to the, to the general public and that money was you know used to pay taxes and it was you know as they say in the springtime, as I was once quoted on ABC News I think, um, during sugaring you can't dance and it's too wet to plow, so we might as well sugar and it's true. You know, there's not that much going on. The cows aren't out of the barn yet and the guys can't get out and do anything on their fields, so it's kind of a slack time and you know the the price of maple syrup has, it's you know hasn't been great right along, but it's been enough so you know it was worthwhile to go out and make a few gallons and sell it and help pay the taxes. But I see you know with, with the farms and the dire straights that their in and farmers going out of business, um, there is still a lot of farmers who, who sugar and um, and we think that that maybe one of the, you know, one of the saving graces for for the farmer is that if we can um, through research, um make sugaring more efficient and you know understand more about it, that um, that the farmer can use that as a, you know, um, that the sugar maker could invest a few thousand dollars into um, setting up an operation or you know making it a little more efficient. Most of them have them already, you know the sugar houses, generally there and they got the old pans that you know, pans are only used six or eight weeks out of the year and then they sit, so they last a long time and that you know by putting a little money into it and with the price of syrup, um, might be able to make enough in a really bad year farming wise to carry them over the hump til you know something comes along that's going to going to help the farmer. Um, but I also see a lot of, um 9 to 5 sugar makers, people who have a 9 to 5 job who you know have a thousand taps or maybe two thousand taps and you know have it set up so the sap gathers during the day and when they get home from work, they, some of them boil all night and you know it's a very intense period of time and it only lasts for six or eight weeks so usually they can slug their way through it, but you know there's something that drives them do it. Most sugar makers have have some sap in their blood or something. Um...but...

MK I've had some say that to me.

SW I don't doubt it. Um, but you know the price of syrup is such that, that you know you can, you can start to make a dollar at it. And, so I see a lot of the, a lot of 9 to 5 people especially here in Chittenden County where we have

you know a lot of, um businesses. And, then um, there are a lot of new sugar makers who are in it just trying to make a living off of sugaring. I don't know anyone that really makes a living completely off of sugaring. They have, you know they might have Christmas trees or they might have sheep or they consult or you know their a dual income family, something like that. But it's getting, you know I think that the technology is getting there and the price of syrup is getting up to where it should be where a sugar maker can make a dollar and that you know it might not be long before there are people who do sugar full-time and you know put that major effort in the springtime and then the rest of the time is spent marketing and promoting their product and and selling it. So I do see a, you know, a change in the, in the producers that you see at the meetings. There are a lot of people that are, um, not farmers, that it's not just the farmers that are sugaring although a lot of them still do. And I would hope that they would continue that. It's a good tradition, but I also see a lot of the younger sugar makers you know not going the traditional way with buckets and and with wood and those kinds of things. I think there will always be that, that group of people that will do it the old way. But if you want to you know make a profit at it, you have to be as efficient as possible and it's hard to do that with, with buckets and the old time ways.

MK And also you can't tap as many trees and you need more people don't you to help collect the syrup?

SW Definitely. Yea, buckets are, buckets are, this is another area that we've been debating as to whether tubing is more, is less labor intensive and, and I guess the thought is that it's a little bit less labor intensive, but it just spreads it out over a longer period of time. You know, with buckets it's, you go out and tap the tree and you hang the bucket and then for six weeks you go out to, one or two or sometimes three times a day and empty the bloody things and so that's very intensive and then you wash the bucket up and you're done. But with tubing you start you know in, in January or even before that going out and repairing tubing or if you take it in you have to put it back out and get it set up and um, and then, and then you sugar. And that's where I think tubing is an advantage because um, you're not worried about you know getting the sap from the tree to the evaporators as fast as possible as you are with buckets. And, so you're not out in the woods as much. You do have to go out and check your lines. A lot of people think that you know you put up tubing and you sit back and you boil sap and it's

not that way. You, um, the tubing, the tubing set up is only as good as as the set up itself and, and the maintenance of it. And then it has to be all cleaned at the end of the year which is a...

MK That sounds like an awful job.

SW It is. We just, just finishing up ours. We've been so busy with, you know, with the inventory and the adopt a tree program and all the other things going on we've gotten a little bit behind on our tubing cleaning. And it's, it's a really important thing to do because as I've said at the meetings, it's like serving food. You know, to serve a gourmet meal on dirty dishes, to boil sap from dirty tubing or dirty buckets for that matter so it's important to to keep it clean and I think by enlarge, of course the State of Vermont has the, I think the strictest grading laws of any of the maple producing states and our seal of quality program is a great program and, and I think by enlarge the sugar makers are an overly conscientious group of people and they are really proud of their product and they go to extremes to produce the best product that they can and we certainly encourage them to because each producer is a, is a representative of the whole maple industry. You know, one, one can, one gallon of syrup going to, you know um to some town in Nevada if it's bad syrup and you know the word gets out, well there's at least one person that's not going to buy syrup and maybe three or four in that town where if it's a good product and you know maybe half a dozen people want to buy maple syrup and that's, you know that gets into promotion and promotion and marketing, but each individual sugar maker is a representative of the whole industry and so we encourage them to, to produce the best product that they can. And I think by enlarge there's, you know, there's always a few rotten apples in the bunch that try and sneak by here and there, but um, I think that the Vermont sugar makers especially are, are really good sugar makers and I don't you know, there are sugar makers who say they can tell the difference between New York maple syrup and Vermont maple syrup and New Hampshire maple syrup and I contend that if, if it's produced properly, um, and packaged properly that you, you know, if you were to give sugar maker X syrup from Canada and New Hampshire and Vermont and it was all the same grade, that they couldn't tell where it came from and certainly you can tell off flavors and bad syrup, but to actually tell where it comes from I don't, I don't think you can do that.



MK I did wonder about that. I've had people tell me oh you can tell whether this was on a slope that faced south or you can tell that this was on eastern.

SW Well there are instances where you can, there are classic sugar bushes around where there is a certain taste that comes from that sugar bush and it may be that, excuse me, all the trees are down in a swamp somewhere and so it has a distinct flavor and I, you know I agree with that, that you can pick up distinct flavors from different sugar bushes, but I don't think that if it's, as I say if you take sap from three different states and produce a good quality syrup that you're going to be able to tell where it comes from and so my point is that, that you know maple syrup is good no matter where you get it if it's processed properly and that the whole maple industry is is a good industry and but Vermont traditionally is sort of the center or the heart of maple at least in the United States and that when people start comparing syrups, they compare it to Vermont maple syrup and we're pretty proud of our product and that's again getting back to the research center is one of our functions is to help the sugar maker produce the best product that they can.

MK Do you do consultations with individual sugar makers?

SW Yea, we do, we do quite a bit actually and that gets into another area of contention as to the amount of extension work that we do. That a, Um, like, you know, in ways we're not compensated for it. The Extension Service is and it's not really Extension Service's fault. I don't know where in the fault lies, but the Extension Service is strapped, just the way we are for budgets and stuff, but, but we do a lot of extension work and a lot of sugar makers come up here and um, you know when we can if they call, we go out and, and go to their sugar bushes and you know try to impart some of the knowledge that we've picked up. We don't we don't say that we're experts, but having gone around to any number of different sugar bushes you can look at a sugar makers problem and you can say well you know have you tried this or maybe you should try this or you know I was at this guy's place and I saw him do this. Um, just, you know, passing information back and forth. And we do speak at meetings, all the maple meetings. And we, we have quite a listing of publications that are available through the Extension Service, so we do, I love to get out. I just love to get out and look at new pieces of land and talk to the sugar makers. And it's generally, it's frustrating in a way because often times you can't really solve their problem because it's a question that just hasn't been answered and we don't have

the answer to. It's really gratifying to go out and you know be able to find, you know, if somebody has, I remember going to a sugar bush in the southern part of the state where the guy had just switched from buckets to tubing and he said his production was way down and he was ready to go back to buckets and he couldn't figure out what was going on. And, so I went down and looked at it and it was just in the way he set up his tubing. Um, it was just a poor installation and he just hadn't gotten the proper amount of advice to set it up properly and you know he had tubing running up hill and, or I should say downhill when it should have been running up hill and just an improper set up and once, once you know he had the basic idea of what he needed to do his production increased significantly, so that was kind of a success story and we do have instances like that. But often times people you know they want to know why their tree is dying and you know, sometimes their guess is as good as mine. But often times you get, you'll see something on the tree that they that they won't see or, um and after looking at a lot of trees, you're able to start to pick out things and say well, you know, it's probably this and probably that and these are the things you can do or there are certain diseases that the tree gets that it's not going to recover from and you know I can look at a tree and I can say well that tree has armelaria(SP) or a shoe string root rot and I know that once a tree has armelaria that it doesn't recover. It will die you know, sometimes it goes fast and sometimes it, it just takes forever to die, but eventually it's going to die and so, and it might be a nice healthy tree beside it that's being shaded out by that tree that is going to die and so it might be the recommendation to take out that tree in favor of the healthy one and let that take off and become a good producer whereas the one that's dying is marginal. So, you know, it's, each each place we visit is different and yet they're all the same in that they're, you know they're sugar makers and it's a sugar bush and they have a sugar house and system of gathering and a system of boiling and so it's interesting. It's good work. I like to do it. I really do. I wish I had more time to, to do more extension work like that. Um, I went down and looked at a bush on Saturday. It had been hit by parathrips down in Huntington. And a week ago, or well two weeks ago, the foresters had been in there and recommended that the sugar maker not tap next year, that it might or it might be a good idea not to tap next year. And he was really upset about it. So I went down and looked at it and by the time I got down there the trees had already started to re-foliate, they had started putting out new leaves, a second set of leaves and so the trees were looking pretty good

and I recommended that he go ahead and sugar, but be very conservative with his tapping rates and also to, you know, to go through and trees that were heavily defoliated, and should be marked in such a way that he would know, that he should pass by that tree and he should add on new trees higher up that weren't affected by parathrips, so um, I've gotten so I sometimes go out on weekends because I don't have time to do it during the weekday. And, but it's still just as much fun, just takes away you know time from home.

MK I think the only thing, the other thing I wanted to ask you is what do you see as you look at the future for the industry in terms of new technologies developing? Have we gone about as far as we can go with um, maximizing the sugaring process or?

SW Oh I'm not sure, maybe it's the question have we gone as far as we should go?

MK Okay, let's take it that way.

SW Well I don't know. I was talking to Dave Butoff this morning who's the manager of Small Brothers U.S.A. and we were talking about evaporators and he was saying; I was talking about how we wanted to put a new sugar house in up here and we wanted to have state of the art equipment and we got talking about state of the art equipment and he said well you know maybe in the future you'll you know put your syrup, your sap in a little box and press a button and, and it'll come out in a container as syrup and you know is that is that the kind of thing that we're talking about as state of the art or is that, is that the future for sugaring. Um, I really don't think so. I think that it, you know, we still, we still have the resource out there and the, the equipment here and we have to get that resource from, from the woods to the sugar house. So I think that the, you know, there's always going to be some way of gathering sap and um, I think the newer, the newer things that might come along are maybe in the area of trees is, um, cloning or tissue culture you know so a sugar maker can take a field that is, or a farmer can take a field that's no longer in use and plant it to sugar maples for a sugar bush for his grandchildren probably, maybe his children. Um, but by taking clone, or taking clonal either tissue or seeds or plants or whatever from a sweet tree and knowing that you're going to get a sweet tree when you plant it out, so already you're starting out ahead of the game. One of the, one of the problems with generic sugar bush is that you, you get generic sap. You get it from all the trees and some of the trees are high

in sugar content and some are low and the lower the sugar content, the more energy you have to put out to boil the sap down, to get the water out of it actually to make it into syrup. And so the higher the sugar content, the less work there is to do. And so I think that that's one of the areas where a lot of work can be done and again that's that's dealing with the resource itself. So it could be a two fold, ah, conclusion that you come up with a, while you're working on you know getting a good sweet tree through clonal banks or through tissue culture, you might also get a tree that's resistant to a lot of the diseases or the insects, so you've killed two birds with one stone there and um, so that I think that that's one area. And then as far as the equipment goes, there's so much tradition in and very little has changed in equipment you know sort of the shape of things and the style of things. The evaporator pans have changed in size a little bit and the flues have been made deeper and new things have been connected but basically the evaporator has remained the same for you know 150 years or however long they've been around. And there are some new changes coming out on the market right now. And so I, you know, sugar makers are innovative and I think that they'll be, they'll be devices that will come along that will make it more efficient for the sugar maker and make it easier, but it's, there's still going to be that basic getting the sap from the woods into the sugar house and there will always be some sort of a, of a processing plant and you you can't, there were some people who tried to take sap and boil it in a, in a vacuum using a steam heat source and using actually its own it's own steams once you get the process going and to take it from sap to syrup in a vacuum and what they ended up with was a clear tasteless viscous, you know, it had the same, it had the proper density but it had no taste in it, it had no flavor. So you need to have, there's a time, time temperature relationship that at some point in the process you need to expose that sap or sweet sap to a flame or some source of heat. It could be steam too. So those are always going to be givens I think unless they come up with huge microwaves or something like that. (LAUGH) So I think things are going to you know remain fairly traditional, but there will always be new small innovations to make it easier and more efficient. But I think the big area is probably in, with the resource itself. I think coming up with that sweet tree. There's the old Jones rule of '86, you divide the sugar content of a tree into 86 and that gives you the number of gallons of sap to produce a gallon of syrup. So if you have a 2% tree, that's 34 gallons of sap, or 43 gallons of sap to produce one gallon of syrup. If it's the 1% tree, you need 86 gallons of sap. But if it's a 10% tree, you only

need 8.6 gallons of sap to produce a gallon of syrup. So the high sugar content tree is what we're looking for and some of the thinning that we've done with these young trees after looking at the sugar content and we'll look at three trees and two of them definitely have to go and first of all we'll look at the general health of the tree and say well okay there all, they are all relatively healthy, they've all got their feet in good soil and everything so we can, we can, we don't have to worry about the physical appearance of the tree. So then we pull out the computer sheet and we look at the growth rate and the sugar content and if, if the growth rate of two of the trees are slow and the sugar content is low, then those two would go and we'd, and we'd favor the the higher sugar content tree and assuming it's the healthiest one too. Because certainly you, just because the tree's high in sugar content, we know that it's going to remain high, but it may, if it has a defect in it, it may die out in ten years and only give us X numbers of gallons of syrup where if we had saved that tree that wasn't quite as sweet but a healthier tree, you know over the long run it's going to two times X amount of syrup. So those things have to be looked at. But getting the sweet tree I think is, and if we had sweeter trees that would help the manufacturers of equipment because we wouldn't need if the sap was sweeter, we wouldn't need you know as much evaporating process so the pans might be smaller and we might use a different, different source of energy to evaporate with. Just because we don't have to get rid of so much water and the reverse osmosis industry is another, you know that's just a concentrator. It just forces the sap through a very fine membrane and the solids are separated out and 99% of the solids of sap are sugar and water goes one way and \_\_\_\_\_ and concentrate goes the other way and it's a fairly efficient way to, to concentrate the sap. So I think that's probably an area where there will be some new innovations coming along fairly soon.

MK Are you finding that reverse osmosis process or?

SW Well no, just, oh refining it yes, yea, yup, yea, and the technology and getting the price of the machines down.

MK What do they cost roughly?

SW Well, let's see. I guess for a, for a small, we've felt that you need to be at least a 5,000 tap operation in order to justify having an an RO and for a 5,000 tap operation, you probably need one with, with two vessels and that might cost around, I don't know, \$10,000 something like that. I'm, I'm not really up on the

prices. I know that the unit that we had here which was a very small unit and that, that was, we got that back in '82 or '83, it was \$9,000 and that was only good for, it was called the baby model and it was sort of the the hobbyists model, but we were doing some testing with it and unfortunately we lost it in the fire. Um, but I think that that RO is is the wave of the future also. It seems to produce a good product and does it efficiently. And they're easy to run you know, you just need a source of electricity.

MK It takes the place of the conventional evaporator or it's in addition to?

SW Well it it will take place, it will take the place of the back pan of an evaporator for sure because you have, normally the sap comes in at about 2% into an back pan and about 80% of the boiling is done right there so when it comes out of the back pan into the front pan, it's about somewhere around 10% and with a, with an RO you get 2% sap coming in and depending on how, how you run the machine, generally people draw or run it through so it comes out at about 8% so again you've almost done 80% of the boiling right there and gotten rid of 80% of that that boiling process and so you've eliminated the back pan so you can go with a you know with a smaller, smaller unit or just a big finishing off pan with steam which is the way some producers do it. There's a lot of innovative people out there trying different things to you know, to make it work as inexpensively as possible.

MK Ah, it's amazing to think about the changes though.

SW Yea, it is, but change is good and I you know, as I say I think there will always be a few of the old time sugar makers, the people who still gather with horses and people who use buckets and, um, people who don't use hydrometers and you know all that kind of stuff. There will always be those people, but...

MK Do you ever encounter people that are resistant to the, to the changes just because they believe it should be done the traditional way?

SW Sure, yea, there's a few of the old, old people around that, you know they'll come and look at our operation and just shake their head. And you know, having having hoods over the pans is just so foreign to them because they can't see what's going on. And yet to me, when I started working up here there were hoods over the pans and this is where I first started working in sugaring. So I haven't,

I hadn't known anything but hoods over the pans and it was fine with me because I knew what was going on. I had other ways of detecting what was going on and, but it was kind of interesting to, and it was fun to, to work up in the old sugar house this year with, there is no hood on the front pan and we fired with wood. And just the, well the noise level one thing, because with the oil fire burners, there's that roar and we had the RO going in there and it was like a deafening silence up in, up in the old sugar house. You couldn't fall asleep at night down here, it was so noisy. Up here, one night, we boiled all night one night until 12:30 the next night too and we had the big run and Ed and I were boiling together and Ed started getting, he started having double vision, he was so tired and he said he had to sit down. We had a big chair up in there. So he sat down in the chair and like that he was asleep. And so I was watching the evaporator and I was tired too, but I can remember the sensation of standing there and I was putting the dipper in and checking the density and all of a sudden just having this, this sensation of falling forward and I was just, you know I'd closed my eyes and I was starting to fall asleep standing up and um, so there wasn't the noise there, that's what got me going on that. There wasn't that pounding noise to keep you awake and there wasn't, um quite as much to do. You know we had the RO going and all that kind of stuff and we had two evaporators going and with just one big evaporator going there wasn't quite as much to do. So, so it was nice to to have that and it gave us pause for thought on our new sugar house and how we're going to build that. How we want to, we want to have an RO, but that's going to be, anything that's noisy will be contained in, in kind of a sound proof room within the building, but that can be heated because an RO needs to be kept warm you know on those days when, well in the winter before you start sugaring those things need to be kept warm so we've got a lot of good ideas for, for our new sugar house which we hope to, to have just down the road. The new building we hope will be right in this, it will probably be turned a little bit more like this and it will be once once and again as wide and just probably as long or maybe even longer than to the end of the annex now and all of this will be taken out. Some of those trees will be taken out there and new parking space will be put in down below and then the new sugar house would be down the road probably on the right hand side, on the left hand side. Lots of plans.

MK Lots of plans, yea.

SW Lots of plans, but no, no dinaro yet. (LAUGHING)

MK Well hopefully there will be some soon.

SW Yea, we hope so. We hope so. One of the, one our neighbors, Jean Archibald, really great lady down the road came up the day after the fire and asked if there was anything she could do. She was offering her house and her bathroom and her cooking facilities for anything that we needed and I said, "Well, you know, I think the best thing that you could do would be to write a letter and send it to Leahy, and Stafford and Jeffords," and it got sent to Kunin and Dr. Coor also. But it was just a, just a three three paragraph letter, in fact I can show it to you, just a statement. And as it turned out, it became a petition of what the research center meant to Underhill and and the local people here. And they had this petition all around the stores around here and we got a lot of signatures on it and all of those went to Dr. Coor and copies of it went to Governor Kunin also. And Jean Archibald and Eve Shakespeare and Irene Lindy and they wrote this thing and it was just great. Well Jean got a letter from Senator Leahy just the other day saying that the um, proposal that he had sent in for the appropriations for funding here, for I think it was a half of million dollars for the building and \$100,000 for research had passed the, one of, the Senate, sub Senate Agricultural Committee and that it was on its way to, to the full Senate and then it had to be passed by the House. So we're keeping our fingers crossed that that's going to come to fruition, we'll see.

MK That's great.

SW Yea, there was a lot of good community support. We hope that when we, we plan to build the sugar, the lab is planned to be contracted out and because we're getting Federal money we'll have to have bids on it and go through that whole process, but the sugar house we want to plan and design ourselves and build ourselves as a, as a farm project. And we get a publication out of it. But also we hope to for the main structure, when that goes up, to have a like a barn raising and you know get it all planned out and get a few good carpenters and a lot of gofers and you know make a, make a weekend of it and a, you know there's a lot of sugar makers who have offered help and we'd like to have them be a part of the, of the building of the new sugar house and so we think it would be a great project and kind of, we feel as though we're part of the community here already and you know we encourage there's a number of cross country ski trails that go through our property and we encourage the local people to come up and visit and, and you know we like to think that this is a, you know a



nice sort of protected area that's managed that they can, they can use to a certain extent too. So.

MK Just very briefly, how did you get it, how did you get interested in this, this type of work and what's your background?

SW Well, where to start. (LAUGHING) I was born in Massachusetts on a rainy night. I was born in Massachusetts and, and I'm very proud of that too. I've been working very hard on my family genealogy and I have a lot of relatives that were here in the State of Vermont you know settling the State and it just happened that a few generations moved out and went across the border into Massachusetts and I happened to born there, but um, my, my grandfather's twin brother married a St. Johnsbury girl and they had a summer place up here. They were artists and they met at art school down in Boston and they had a house on Hastings on the Hudson and they had a summer place up here in Danville and my grandfather came up to visit and he fell in love with the place and he bought the little school house down the road there in Danville and he had five kids one of which being my Dad and the school house was too small so he bought what we call the White House and that's where we stayed. You know, Aunt Marmie would bring her kids up there for a couple of weeks and Dad would bring us up there and so we started spending a lot of time up there as kids and then my Dad's sister who was my Aunt Jen, she and I became very close and I started coming up to her house in the summertime. First it was weekends, then it was weeks and then I'd come up for a whole month. Then I started coming up all summer and I worked in the Danville General Store one summer and worked on the water shed project over there and then in '66 I moved up there full time and she moved up. Her place was just a summer place for 36 years and then she decided after her husband died to to make it a full time residence so she asked my parents if it would be okay if I came and stayed with her through the reconstruction process of the house and everything and they said fine which was great. So I had just graduated from high school down in Massachusetts and I took a post graduate year at St. Johnsbury Academy and spent two years living with my aunt there. And then um, I went to Lyndon State College for a semester and then I got drafted and in '67 and was in the service for three years and then came out of the service and nine days later was married to a St. Johnsbury girl and we, we lived in the Danville area for awhile and then we went out to Oregon for two years and I'd gotten my degree in Civil Engineering. I'd been an engineer in the service, but my, my love was always the woods and being

outside and I couldn't find anything in, in the army that you know was forestry related particularly except for surveying so I was a surveyor in the service and it was easy just from all that background to come out and get my engineering degree and so then we moved out to Oregon for two years. And I was a forestry engineer out there and had a great time and my wife got her masters in guidance and counselling and then we had a, the summer of '74 we rode our bicycles back from Oregon across Canada. It was just the greatest trip, unbelievable, no responsibilities, no jobs, nothing and we just you know took off and for seven weeks pedaled our brains out and had a marvelous time and came back to Vermont and oh, I did some, we thought you know, here we are coming back to the home State and everything that people would just be waiting at the borders you know offering us jobs and everything. We had a duce of a time finding work and I was, I was painting houses and working in the woods and you know doing, remodeling kitchens and just doing all kinds of stuff and Susan got a job over here in Colchester as a guidance counselor and Dr. Morselli who runs the maple lab down on campus was here at the time and she and her family bought what we used to call the White House. It had been sold a couple of times since my grandfather owned it, but they ended up owning it. So, as a kid I grew up with the Morselli girls and Dr. Morselli and her husband and the three daughters and we used to go on hay rides and barn dances and we were great pals and so I had come over to Burlington one day. Susan was over here. She had gotten her job. She found an apartment and I was doing stuff over in Danville. And we'd already built a house over there. We had 100 acres of land. We built a house and you know things were getting split apart and it was just a, it was a nuisance and I came and I went to see Dr. Morselli, just as a, on a personal visit and I was also looking for work and there was a position open here, just a part time position for sugaring and so I started here in February of '86 and in May, Fred Laing got a a big, it was a wood chip grant that he was working on and it just, you know it was perfect kind of work for me. It had a lot of engineering stuff in it and so I was hired full-time then and here I am.

MK It's a great saga. (LAUGHING)

SW Well there are a lot of little off sheets to it and a lot of things happened in between, but I've been right here for, for twelve years and really enjoy it. It's a great job and so.

Sumner Williams

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MK Well thank you very much for taking so much of your time  
this afternoon.

SW Glad to do it. Oh, I can, I can talk about sugaring and  
the farm until the cows come home I guess. (LAUGHING)