FRANK DENNIS

June 21, 2004

Jeff Charnley,
Interviewer

Charnley: Today is Monday, June 21st, the year 2004. We're in East Lansing, Michigan, on the campus of Michigan State University. I'm Professor Jeff Charnley interviewing Dr. Frank G. Dennis, Jr., for the Michigan State University Oral History Project for the sesquicentennial. Sesquicentennial will be commemorated next year, in 2005.

As you can see, Dr. Dennis, we have a tape recorder here for our interview. Do you give us permission to record this interview?

Dennis: Yes, I do.

Charnley: I'd like to start first with just some general questions about your background. Where were you born and raised before you went to college?

Dennis: I was born in Lyons New York, but I was raised on a fruit farm in the town of Rose, which is in Wayne County, Upstate New York. My father had a fruit farm, which, unfortunately, wasn't particularly successful. That's why I'm here.

Charnley: So you're from an agricultural background?

Dennis: Yes, from a small fruit farm.

Charnley: What type of fruit?

Dennis: It was mainly apples. Dad had a few cherries. He raised string beans, as well, or snap beans, as they're called, but it was primarily apples.

Charnley: Did the Depression affect the farm at all?

Dennis: It was too early for me to tell. I was born in 1932, and I always consider things to have gotten better as long as I've lived, except for a few recessions, because I didn't realize it was a Depression; I thought things were normal and they got better. But, of course, my father went through the Depression.

Charnley: Did Upstate New York have any severe weather problems during the Depression? Obviously in the Dust Bowl they had that, and I wondered if that affected agriculture there.

Dennis: No, there weren't natural calamities, I would say. In the fruit business, there's always the problem of frost. That's one of the great dangers. We had a very poor site for growing orchards, because the farm was flat and we had poor air drainage. If you have elevated hills, the cold air drains off.

Charnley: You were in the low area?

Dennis: We were in this low area. It was a heavy clay soil, which never should have been planted to apples, because we had ruts from one end to the other by the time we got through spraying. It just wasn't the right place to plant orchards. But at the time, it was planted, in the 1920s or thirties, they didn't have to spray as much and things weren't that difficult.

Charnley: What chemicals did they use in those early days?

Dennis: Lime sulfur was one of the main ones. They had the lime sulfur paste that was applied. Of course, DDT was being used. Phygon was a mercury-containing fungicide that was used, which would be outlawed today; and arsenate.

Charnley: What were they mainly concerned with? Was it insects?

Dennis: There were both insects and disease. The primary disease of apple is apple scab, which is caused by a fungus, so they have to use fungicides on that. As for insects, the big three were curculio, apple maggot, and leaf-roller at that time. They're still major problems. The apple maggot is a bad one, because one year my father tried to cut down on costs of spray materials and we got some maggot, and if you have one maggot apple in the load, out goes the load. So I spent the fall looking at apples as they came over the grader one by one to pick out those with maggot stings—and fortunately we didn't get any loads kicked out. It was sort of nip and tuck, though.

Charnley: And so growing up, how large was your high school that you went to?

Dennis: I don't remember the total enrollment, but there were only nineteen in my graduating class. I went to a three-room grade school, which was built in 1938 to replace the one that burned. So there were probably ten, twelve, in my first grade. As I say, about nineteen in my high school graduating class. So I was a four-letter man. There wasn't that much competition. [laughs]

Charnley: To field the team.

Dennis: That school is now consolidated with another one, so probably I wouldn't have been a four-letter man today.

Charnley: What was your favorite sport that you played?

Dennis: Oh, I would say basketball. I played soccer, basketball, baseball and tennis. But I enjoyed all of them, really. Baseball was not as interesting, because if you're out in left field, you know, there's not that much action unless you've got some heavy hitters on the other team. You have to stand around more. In soccer and basketball, you're always on the go.

Charnley: When did you first start thinking that you might go on to college?

Dennis: I don't remember. I guess I always planned to go to college. My father was the first member of his family in about four generations that went to college. He went to Syracuse

University and took agricultural there when it had an ag[ricultural] school. Later the ag school there was terminated. The State College of Agricultural was at Cornell, and the State College of Forestry was at Syracuse. So he went to Syracuse, but I went to Cornell. But as I say, I always thought of going to Cornell.

Charnley: So your father and mother encouraged you?

Dennis: Yes. They were both college graduates.

Charnley: Did your mother work outside the home?

Dennis: Very little. She worked part-time seasonal labor. In the cherry season she might work at the cherry processing plant, but she didn't have a steady job.

Charnley: Were there any high school teachers that had an important influence on you that you remember?

Dennis: Oh yes. I had some good teachers. I had two older sisters and I was always called "Brud" because I was a Frank Jr., so I'm a little "brudder." My friends, my family, everybody called me Brud. In eighth grade Miss Charlotte Hannett said, "Okay. You're going to be called Frank. We can't call you Brud anymore." She called me Frank, but everybody else still called me Brud.

I had an English teacher and Latin teacher in high school, Miss Mabel Smith, that I respected very much. My high school principal, Paul Edinger, was a very good teacher; he taught math, and also a good principal. I liked him. I had a coach, a soccer coach, that would bawl you out during the game, but he was always patting you on the back afterwards. He made you mad during the game because he was always giving you hell.

Charnley: He was competitive.

Dennis: Yes. Right. So there were a number of teachers. One teacher, Celestine Malchoff, when I was a sophomore, thought I wasn't being challenged enough because we were studying onomatopoeia and whatnot, and so she assigned me a book to read, and I had to give a report on it. So that kept me busy.

Charnley: Additional work.

Dennis: Yes, additional work.

Charnley: That's interesting. Your Latin teacher, did you anticipate you'd be needing that in your later work?

Dennis: I liked Latin. I don't think I anticipated particularly how I might use it. I switched schools after my sophomore year and they weren't teaching Latin. A teacher tutored me in my third year of Latin. But I enjoyed Latin. We had to think up words that were derived from Latin;

I never had any problems with that. I liked language. Later I learned French, but that was on the job in France.

Charnley: How would you describe Cornell when you first got there?

Dennis: Big. It was big to me. Now it's not big, because there are only ten thousand students, and Michigan State is much larger, but it seemed like a very large school to me. I remember thinking, "Now, where do I stand among these students? I'm from a small school. I've been valedictorian of my class." But I realized after a few weeks or months that I was sort of in the middle of the population of the distribution of students. So I enjoyed going to college.

I went out for too many things. In high school I played all the sports and was in the Glee Club and whatever, at Cornell I went out for Glee Club and tennis. I got eliminated in the second round of a playoff in tennis, because I met the prep school champ. I played the best tennis I ever played in my life and was defeated 6-0, 6-1, but I didn't worry about it because my opponent was so much better. I went out for wrestling, which I knew nothing about and stayed out for only a few months. I was in a fraternity and the Westminster Fellowship Presbyterian Youth Group. So I was in all of these activities, which was really too much.

Charnley: Did that affect your studies at all?

Dennis: Well, it didn't help them. I managed to maintain grades.

Charnley: When you started, did you anticipate you'd be going into the field that you ended up?

Dennis: No, I planned to go back to the farm. That was my goal from the beginning. I took a leave of absence in the middle of my junior year because my father had a heart attack and wasn't able to run the farm, so I went back for a year and worked on the farm. My wife, Katharine Merrel, was also a Cornell student. I had met her before going to Cornell. She was from the adjacent town. We were married when she graduated, in 1954. After we were married, she took a job teaching home economics in my hometown of Clyde, and I went back to Cornell. It was a sixty-mile drive back and forth, so I commuted weekends. I graduated a year later.

At the end of that year, I realized that my father was heavily in debt, and that there wasn't much chance of really making money or making a success of farming on this land. He had two strikes against him because of the poor soil and typography. He had some good area, but most of it was poor. So I decided that I'd better do something else. I worked as assistant to the manager of a large fruit farm at Sodus, New York, which is on Lake Ontario. Assistant to the manager meant errand boy, really, but I learned a lot there. He sent me off to buy apples, and I worked on the packing line, and on other jobs, and it was really quite an educational experience.

Charnley: So you got to know the industry more than just the growing.

Dennis: Right. He had already arranged for somebody to work with him as assistant manager; there wasn't an opportunity there, so I looked for another opening. I worked for a grower in Niagara County, which is in the Niagara Falls, Buffalo area, with the idea that that might work

into a partnership. Unfortunately, we were not well matched. He was an ag economist. In fact, he had a Ph.D. in ag economics, and whenever the grader stopped, he could see the nickels dropping through the floor, or the quarters or dollars, or whatever it was. As a result, I was always trying to work faster, and the faster I worked, the more damage I did to the machinery. So we decided that we weren't compatible.

I then thought about other farm jobs. But I then talked with my undergraduate advisor at Cornell, Professor [Robert M.] Bob Smock, who made a name for himself in controlled atmosphere low oxygen, high CO_2 storage. When I expressed my doubts about whether I was capable of doing graduate work, he reassured me by saying that the main requirement for graduate work was persistence. So it wasn't all brains; a lot of persistence there. With that encouragement, I went back to school.

Charnley: And you continued at Cornell?

Dennis: I started out with the idea that I'd get a master's, but that developed into a Ph.D.

Charnley: And you didn't get the master's then?

Dennis: No.

Charnley: Was that common in science?

Dennis: No, usually you got a master's, and as I say, I intended to get a master's. My wife got a master's in home economics, and then she worked for a professor there while I finished my Ph.D. So she got one of those Ph.T.'s (Putting Hubby Through) that helped me through for her.

I don't know whether you want me to ramble on here.

Charnley: Absolutely, yes. What direction did you take in graduate school?

Dennis: My graduate thesis was on inducing parthenocarpy in apples. Parthenocarpy is the development of a seedless fruit. I always told my students, *parthos*, that's *virgin*, and *carpos*, that's *fruit*, from Greek. There are chemical sprays that will induce parthenocarpy. So theoretically you could spray your orchard, not worry about the bees, and set a crop of fruit.

But the interesting thing was that my father-in-law was a beekeeper. He had about four thousand colonies of bees. One of his sources of income was renting bees to orchards. So I was kidding him that I was going to put him out of business. But fortunately for him, unfortunately for me, these chemicals (gibberellins) were not very effective in inducing fruit set, so it didn't put him out of business.

Charnley: So the bees continue.

Dennis: The bees continue.

While there in graduate school I worked with a professor J.P. Nitsch, who was French, and he returned to France to operate a laboratory over there while I was finishing up my Ph.D. I applied for an NSF [National Science Foundation] fellowship, a postdoc, and lo and behold, I got

it, which was very good. But I think mainly it was due to Nitsch because he had a very good reputation.

So we went to France and we traveled on the *United States*, the ship. It was mid-winter, February, and it was extremely rough, so most of the people were down in their bunks below while I managed to stay afloat there.

Charnley: Where did you leave from?

Dennis: We left from New York City, went to Cherbourg and took a train to Paris.

While there, my goal was to identify these compounds, gibberellins, which are naturally occurring in apple seeds. Immature apple seeds were known to be a rich source of these gibberellins. So we collected two tons of immature Golden Delicious apple fruits from an orchard. Some fruits had to be removed as so there were too many on the trees, so we thinned them and then saved these fruits, put them in the cold room, and took out the seeds. We got about twenty kilograms of seeds, and then these were extracted.

The procedures for identifying gibberellins were pretty primitive at that time, so I spent a whole year and part of another back at Geneva, New York, where I took a job in 1962. I finally identified them. Today what I did in a year and a half could be done in about three days because of the advances in techniques. You need only microgram quantities for identification now. But it was a wonderful experience for us. We had time to travel around not only in France, but we went to Italy, Greece, Austria and Yugoslavia, and various other places, including Denmark.

Charnley: And that was in the early sixties?

Dennis: Early sixties. I finished my Ph.D. in ’61 and we came back in ’62.

Charnley: Did your wife assist with the collection of your initial apples?

Dennis: She helped take out the seeds.

Charnley: That’s one big pile of apples. [laughs]

Dennis: I have a slide of a professor from Yale, who was visiting there, who was taking out seeds for me.

Another thing about it was that Dr. Nitsch had contacts with a lot of professors, not only in the United States, but various other places, so I met a lot of these famous men and women while I was there in France.

Charnley: They were visiting?

Dennis: They were visiting.

Charnley: That’s interesting. Did he have any continuing contacts at Michigan State?

Dennis: He was at Cornell.

Charnley: Cornell, that's right. So he didn't have any.

Dennis: No. He left Cornell and stayed in France.

Charnley: Did you have any later contacts with him?

Dennis: Oh yes. I visited him later. He had a tragic ending. He was taking scuba diving lessons and he died. For some reason his wife thought that—they had filled up their air tank at a gas station, I think she thought there must have been some fumes or something in it that he inhaled. He was about fifty when he died. I kept contact with his widow.

Charnley: So when you came back, was there any follow-up that you had to do as far as the NSF was concerned? Did you have to write a report?

Dennis: Of course, I wrote a report to NSF, but then I took a job at the Geneva Experiment Station, which is part of Cornell. It's about fifty miles from Cornell on the Finger Lakes. As I say, I finished the work there. And I don't remember now; I suppose I wrote a report to National Science Foundation at that time. In my now job, I worked on propagation of plants such as raspberries and apple rootstocks. I wasn't too successful, but it was interesting. I continued some work on these gibberellins in terms of their effects on inducing parthenocarpy.

Charnley: Did they use that in grapes, in developing the seedless grapes?

Dennis: Yes. It was being used on grapes then and still is used. The interesting thing is that these are naturally seedless grapes. Actually, gibberellin reduces fruit set. There are many berries on a cluster if they're not treated, and they're small. What the gibberellin does is to elongate the stem of this cluster, so the berries are farther apart, and it also enlarges the berries. So you've got a larger, looser bunch. It's not so much fruit set as it is enlarging the berries. It's also effective in inhibiting flowering in some plants, including apple. Dr. [John] Bukovac here used it on sour cherries to limit flowering in trees that are growing slowly because of virus infection, and this overcomes virus effects.

Charnley: And then the trees still remain productive as a result of that?

Dennis: They're more productive. It increased production 10, 15, 20 percent because of a larger bearing surface.

Charnley: So you're in Geneva at the Experiment Station. Was there any teaching involved in that or is that all research?

Dennis: That's what I missed. I enjoyed the teaching I did as a graduate student. I probably would have stayed at Geneva had it not been for inability to do any teaching there. I was a Scout master, but I didn't have any teaching responsibilities.

Charnley: Had you been a Scout yourself?

Dennis: I got all the way up to second class. [laughs]

So I learned about this job at MSU. Actually, John Bukovac gave a seminar at Geneva. He had given a seminar at Cornell, had I brought him from Ithaca up to Geneva. When he heard me say that I was interested in teaching, he said, "Well, we have a job opening at Michigan State."

So I interviewed for the job and was hired. Now, that was in the old days. Today they'd have to interview three or four people, but at that time they interviewed just one and hired me. I was at Geneva from '62 to '68 and came here in the fall of '68. [Dr.] H. John Carew was the chairman then, and John was very personable. I always said that when John came into a room, the room sort of lighted up. Very friendly, a good storyteller, just a very supportive chairman.

Charnley: What was his area of work?

Dennis: He was in vegetable crops. He was a Cornellian, actually. He'd been in service during the war, finished his Ph.D. when he came back from service and then came to Michigan State in veg crops. He was Extension specialist in vegetable crops. Then when Dr. [Harold] Tukey retired, John was named chairman.

Charnley: Was Sylvan [H.] Wittwer in the department then?

Dennis: Sylvan had just moved over to become director of the Experiment Station.

Charnley: When you arrived then in '68?

Dennis: When I came here, I remember meeting with Sylvan. I'm sure that he asked for an interview with me because he was director of the Experiment Station. I remember his saying that he had never had more than $1,000 worth of support from the University in any one year during his tenure, that you had to go out and get money somewhere else. I later learned that wasn't quite true, because there were some cases where he'd had more than that, but that was a minor slip of the memory, I guess. Also I remember Sylvan was good on timing. I knew when to leave because Sylvan stood up, shook my hand, and said, "Well, nice talking to you." [laughter]

I knew Tukey only superficially. I was advisor to the Polmoler Club, which is the pomology, fruit, and olericulture vegetables club, and he gave a talk after his retirement. He was a very good lecturer. I still remember the examples he gave about fruit morphology. This was one of his specialties. He opened his coat—he was wearing a coat jacket—and pointed to the inside pocket—"In here are the ovules that become the seeds." He pointed to the seam in the back of his coat, "That's your dorsal suture, the dorsal suture on a peach," which is the "dent" in the peach. "You close your coat here, now you have the ventral suture on your peach." It was very good.

Charnley: He was a walking visual aid.

Dennis: Yes, right.

Charnley: That's interesting.

Dennis: I remember hearing him give a talk. That was earlier when I was still at Geneva, but he gave this talk, which he was famous for, entitled "The Great Green Carpet of Horticulture Covering the Earth."

Charnley: He seems like one of the memorable characters or figures in Michigan State history.

Dennis: Yes. He built up the Department quickly when he came here in 1945. As I said, he was from Geneva.

Charnley: He'd gone to Cornell, too?

Dennis: No, He took his PhD at the University of Chicago. He'd worked in morphology there. He was doing propagation at Geneva. He was responsible for much of the early work on dwarfing rootstocks, so he had imported rootstocks from England and was testing them there.

Charnley: How important was the horticultural department in the state? At the time that you came in '68, how would you describe the Michigan agriculture in terms of the fruits and vegetables?

Dennis: I had a job offer at Minnesota. I interviewed at Minnesota and interviewed here, and at Minnesota I would have been the hormone man, so to speak. Here Bukovac was a hormone man, and the fruit industry was much more important here than in Minnesota, and that was one

of my reasons for coming here rather than Minnesota. So I would say that the fruit industry, in particular, was very strong. Michigan has been-- I shouldn't say always, but for many years-- as been strong in fruits, vegetables, ornamentals. It has become even stronger in vegetables and ornamentals today and there has been a shift in the department in terms of faculty positions in fruits moving into ornamentals, not only because of the importance of the ornamental industry, but because of the numbers of students.

We might have had twenty students in pomology, when I came here. We probably have three or four, five, now, and the same is true of vegetable crops, whereas in ornamentals, particularly woody ornamentals, there's been a very great increase in numbers of students. So when I retired, my job was transferred to a woody ornamental person.

Charnley: An interesting generational shift.

Dennis: Yes. The vegetables and ornamental people have always complained that fruits got the long end of the stick.

Charnley: It seems like probably a legacy of—

Dennis: Lion's share, I should say.

Charnley: —Professor Tukey, wouldn't it be?

Dennis: Perhaps. Yes, I think there always was more pressure from the fruit industry. For example, the Michigan State Horticultural Society really should have been called the Michigan State Pomological Society, because it was essentially pomology. And when they had their meetings, it was all pomology. Later there was a Vegetable Council formed and they had vegetable meetings. Now they've combined them so there's one horticultural meeting in the Expo state. But at that time the fruit growers had more impact in terms of legislation, had more contact with the legislature and so on.

Charnley: Was a lot of that concentrated in west Michigan and northern?

Dennis: Traverse City area, the Hart-Shelby area, and southwest Michigan.

Charnley: Oceania and Mason counties?

Dennis: Yes.

Charnley: When you first got to campus, and your wife was with you at the time, how would you describe the mood on the campus in the sixties, late sixties, when you arrived?

Dennis: I have to say that my wife got a master's in French. She had a master's in home economics, but she decided, after staying in France for a year, she was very much interested in France, and she took some courses when we were still in Geneva in French. Here she got a

master's in French, and then she taught at Okemos for a couple of years. She had taught French, not in Geneva, but in the adjacent town, Lyons, and she had enjoyed it.

Here the mood was very different. The kids were more university-conscious. For example, they wanted independent study. How do you have independent study in French if you don't know any French? There was just a very different attitude, so she decided that she wasn't going to stay more than a couple of years.

On campus, in agriculture, I never sensed that kind of attitude. I think of agriculture students, those in horticulture at least, as being serious students who were not that concerned about politics, for better or for worse. But, then in the '69-'70 Cambodian invasion, things blew apart and there was Tent City over here next to Wells Hall. I've got some slides of Tent City that I used in lectures sometimes, as examples. Here's a student, and the light was just right so it looks as if he's studying a book. A slide taken from the other side show this, it's a comic book. [laughter]

I had a student who was working for me, who was in a teaching curriculum, and she did not quit school, but attended classes off campus. I told her at the time I thought this was a mistake because you're just hurting yourself, and later she agreed. But that was a very difficult time. They broke many of the windows in Demonstration Hall and in the Administration Building. They put in these, not Teflon, but other kinds of windows, that were unbreakable.

Charnley: The metal ones?

Dennis: They put metal (aluminum) in the Demonstration Hall, but they were these—

Charnley: Bullet-proof glass?

Dennis: Yes, that kind of thing. Shatter-proof. So that was an interesting experience, I guess I would say. But I never had that problem in class, because they were more goal-oriented.

Charnley: Did you have any contact with the early presidents? Did you see [John A.] Hannah, or he was just leaving?

Dennis: Hannah was just leaving at the time. I'm trying to remember who then became president.

[Begin Tape 1, Side B]

Charnley: This is side two of the Frank Dennis tape.

When the tape ended, we were talking about President Hannah, and when Dr. Dennis came to campus, and some of the presidents he worked with. Walter Adams, did you have any contact with him when you first got here?

Dennis: I had no personal contact with him. I remember his statement about SDS, Students for a Democratic Society, who "snatched defeat out of the jaws of victory." I always remember that as classic Adams. He always had his cigar. But I didn't have any personal contact.

Charnley: How about President [Clifton R.] Wharton [Jr.]??

Dennis: No. I talked with him briefly once, but he wouldn't have known me. I liked Wharton. I thought he was a very good person. I remember comments about—I think this was when he was head of TIAA-CREF in New York State--that he had all the information in his head. I guess he didn't have to take any notes; it was all there.

Charnley: Pretty amazing he had that ability.

Dennis: Yes.

Charnley: In the 1970s, you were doing mostly research?

Dennis: Research and teaching. I had a fifty-fifty appointment. So I started out a project on dormancy. The reason for studying dormancy—this is the fruit trees—was of the damage done by frost, particularly on cherries in Michigan. There has always been, since Michigan grew cherries, this problem of frost. There's less danger near the lakes because they have a warming effect. They keep the area cooler in the spring and warmer in the late fall, so the trees don't develop as rapidly and there's less danger of frost. Temperatures don't fluctuate as much. So I tried to find some way of delaying bloom. If you could delay bloom, then you might avoid frost.

In Utah at the time, they had developed a system of evaporative cooling, so they irrigated the trees with sprinklers. It's really a mist, and they could delay bloom there in Utah several weeks, up to maybe three and four weeks.

Charnley: Just by spraying water?

Dennis: By spraying water, which results in evaporative cooling. They don't have much rain. It's a dry climate, so by sprinkling the trees whenever the temperature went above certain point, the water evaporates, that causes the heat to be taken from the buds, and that delayed the bloom. I tried it here in a number of orchards, grapes, cherries and various other things. But here we have, first of all, a more humid climate, so there's not as much evaporation and evaporation is not as rapid. Secondly, we had more rainy days and more cloudy days, etc., so I never got more than a few days' delay in bloom. It was very disappointing, in fact. The other problem was that I was running these experiments thirty, forty miles away, so it was a difficult to keep track of them and control them, so that wasn't very successful.

I also tried some chemicals that were reported to delay bloom. None of them was effective without causing injury. For example, gibberellins had been reported to delay bloom in the spring when applied the previous fall. I sprayed some apricots with another chemical – ethephon-- one fall and delayed bloom forever. [laughter]

Charnley: Did it kill the trees?

Dennis: It didn't kill the trees, but it killed some of the main limbs, so there were just the sprouts on them. I decided that wasn't going to work.

There were reports, in fact, that ethephon was effective. Ethephon is a chemical that breaks down and releases ethylene gas in the tissues, and this would delay bloom under the right conditions. But on peaches, if you use too much, you damage the trees, you have a lot of

gummosis on these trees. So that didn't work out very well; none of these chemicals were commercially useful.

One of them, however, that I tested had a marked effect in increasing fruit set without apparent injury. This chemical never got off the ground as a fruit set chemical, but it's now used to delay maturity in apples. It's called ReTain, a commercial product. If sprayed on several weeks before harvest, the apples are firmer, they will keep longer in storage, etc. So the chemical became a commercial product, but it wasn't useful for what I was interested in.

I worked on a "Delicious" fruit set project. There were growers in the state who were having problems getting good fruit set on "Delicious" apples. So I developed a cooperative project. I talked many people around the country, researchers, into keeping track of a) fruit set on "Delicious," and b) weather conditions. A bulletin was published in the early '40s, by V.R. Gardner and associates. Gardner was the chairman of the Horticulture Department here. He had done a study like this, and their conclusion was that the temperatures prior to bloom had a marked effect on fruit set in "Delicious." As I remember, low temperatures reduced fruit set. I analyzed his data and found they were nonsignificant. In the '40s, they weren't using much statistics, or any at the time. So I got these people to cooperate and we did a study on it, and sure enough, there wasn't much effect of temperature on set.

But in the process I kept records on fruit set in growers' orchards and found that there wasn't much of a problem of fruit set. They were getting reasonably good fruit set, and in fact, sometimes they were getting too much fruit set, requiring fruit thinning. So that took me into fruit thinning. I tested a number of chemicals, in addition. The old standby was naphthalene acetic acid, NAA, so I used that with other chemicals, including ethephon, which reduces fruit set, and several chemicals that came out later. Accel (benzyl adenine) was introduced; this has a

mild thinning effect, better when used along with NAA. So these were all practical experiments in growers' orchards.

Charnley: And some of these were commercially available?

Dennis: Yes, some of the chemicals. In fact, most of the chemicals that I used were commercial—well, Accel was new on the market, so I tested that.

John Bukovac, meanwhile, was working on thinning from a more, I would say, theoretical standpoint. He did most of his work at the Clarksville Experiment Station, where he could harvest whole trees and get all of the data instead of partial data. So our results were shared, and we were supported financially by the Michigan Apple Research Committee.

Charnley: So you did a more broad range of—

Dennis: These were all commercial trials in Belding, on the ridge near Sparta, southeast Michigan, southwest Michigan at Hilltop Orchards, Dowd Orchards. They were all grower orchards.

Charnley: To what degree did they look to Michigan State for that support?

Dennis: Oh, they were very cooperative. That's why I emphasize the fact that fruit growers have been very cooperative with the use of their orchards. In one case, this was another chemical, it's Alar—you've heard about Alar?

Charnley: Yes. The Alar scare created by the media.

Dennis: Right. Alar had the same effect as this ReTain. It was sprayed on some thirty days before harvest. It firmed the fruit and they kept longer in storage. In one test, we had rows that were sprayed and rows that were unsprayed, and we wanted to put the apples through a packing house to see what the results would be on pack-out. That year the processing price was better than the fresh market price, so the growers said, "We'd prefer to sell these for processing." But the company that made Alar said, they'd make up the difference, if there was a difference, if we put them through a packing house. So we did, and the returns were less than the growers would have received by selling the fruit on the fresh market. So they didn't lose money, but the chemical company had to pay the differece.

Charnley: Did you continue with the research just on apples?

Dennis: Most of the work that I did was on apples. As I said, some of the work on delaying bloom was done with peaches; peaches and cherries. One of the last projects I worked on was soft cherries. This has been kind of a difficult one to follow. Sour cherries are machine-harvested, sweet cherries are, too, but the problem is mainly with the sour cherries.

Charnley: Because they're softer generally?

Dennis: They're softer generally.

Charnley: When they're ripe.

Dennis: When they're ripe. And sometimes, under certain conditions, they splatter on the canvas, essentially when harvested mechanically. Maybe they don't splatter, but they're so softened that they can't process them; they don't roll when they take them into the processing plant. This was an enigma wrapped in a mystery, so to speak. So we did some experiments. A graduate student—this was a graduate student project—did some experiments in various orchards. We used chemicals, we used shading, we thinned—actually thinned the fruit to see if there was any difference of fruit load, and then these cherries were processed and we took samples. We selected orchards where the soft cherries had been a problem the previous year. Unfortunately, none of these people had soft cherries the following year, so that screwed us up.

But then we worked with the ag engineers in looking at some differences. We started dropping cherries, on various surfaces. One was just a canvas, one was a board, and various surfaces that might be used on catching-frames, and there was a fairly marked difference in the catching-frame material that they followed up on. But they're still working on this one and it's a problem that still isn't solved. One of the problems is variability—not being able to predict when you're going to have soft cherries and when you're not going to have soft cherries.

Charnley: Do you think it's more weather-related?

Dennis: It may be weather-related; it may be nutrition-regulated. We looked at orchards in which they had used or not used nitrogen and this kind of thing, but we just never were able to

get a handle on it. From some recent work, they think they have a handle. We shall see if that remains a problem.

I also worked on some theoretical projects. Some of the first graduate students I worked with did their research on abscisic acid (ABA) in relation to dormancy. Abscisic acid is a compound that occurs naturally in plants. It's an inhibitor of growth in an artificial system such as wheat coleoptile sections. Abscisic acid will inhibit growth of plants in some cases, but it's not very effective when sprayed on. But it was considered to be a prime candidate for controlling dormancy. There were some data that indicated that the abscisic acid level declined during the winter, and then in the spring it was low enough so that growth would resume.

The students worked on peach seeds, on apple seeds, on cherry buds, and the bottom line was that the ABA levels declined, but temperature didn't have any effect, whereas chilling is required to break dormancy. If you take a peach tree in the fall, it won't grow unless it has been chilled. So temperature was having no effect; therefore it couldn't be related to dormancy. In general, our results didn't favor the correlation with dormancy.

Charnley: Who were some of those graduate students, do you remember?

Dennis: Eugene Mielke from California. Prince Bonamy from the Bahamas, Orlando Balboa from Chile. They all worked on these projects.

Fairly recently, we were working on a project to see what the relationship was between gibberellins and flowering in apple. As I mentioned, if you apply gibberellins to apple trees or cherry trees in the right concentrations, they will inhibit flowering, and it's concentration-dependent. If you use a small concentration, you get little inhibition. If you use a high

concentration, you get total inhibition of flowering. I mentioned that apple seeds contain gibberellins, and the hypothesis was that developing seeds produce these gibberellins; which move to the bud where they inhibit flowering. So the idea was, could we measure these gibberellins levels and see if there really was a correlation? For example, if you defruited early enough, did it reduce the gibberellin concentration in the bud?

There were two students. Jun Ban from China worked on metabolism of gibberellins. What he did was to feed precursors of the gibberellins, radioactive precursors, to the seeds in situ on the tree, and then measure what happened to the radioactivity, if he could recover radioactivity in the buds or anywhere else. Unfortunately, that gibberellin didn't move. There were problems involved. It's possible that the gibberellins were metabolized so rapidly when they're injected—they weren't natural gibberellins—that we just got artifacts. I think that's what happened, because we never could identify any of the metabolites.

I had another student, John Neilsen, who was from Utah, who worked on endogenous levels of gibberellins. Jun Ban was working on metabolism; John was working on endogenous levels. John took spurs that were bearing fruits and spurs that were not bearing fruits and measured gibberellins in them. But unfortunately, we could never get good results on that, as far as identifying gibberellins and measuring their content.

Charnley: And this is a continuation, really, of your earlier work, your postdoc.

Dennis: In that case I was just working on identification, rather than correlation with anything. I spent a sabbatical leave in Bristol, England, in the Chemistry Department, working with Jake MacMillan. Jake was a gibberellin expert. This was in 1974, and this was kind of a double-

barreled sabbatical because another professor from [University of California at] Davis, George Martin, was there at the same time. We had agreed we'd do a joint project. We were working on pear seeds. He worked on immature pear seeds, I worked on mature pear seeds, and we measured gibberellin content. A number of gibberellins were identified, including a new one at that time, GA_{47}. There are now over 100 of these known gibberellins. He got good results with identification and quantification of these.

In the dormant, or mature, pear seeds, we were able to identify only one gibberellin, GA_{17}, which is inactive, it was rather discouraging working with this because we couldn't measure levels.

I had done that work in '75, but I hadn't done more work on endogenous gibberellins until this later work.

Charnley: It seems like an interesting thread in your career.

Dennis: Yes, I've always been interested in the gibberellins. I got interested in them in graduate school and remained interested in them.

Charnley: Some of your students were international students.

Dennis: Yes.

Charnley: Was that the case in horticulture?

Dennis: Yes.

Charnley: Any particular countries that there were a lot of at Michigan State that came to study horticulture?

Dennis: There were quite a few from Italy, because we had contacts with Italy. John Bukovac had some contacts there, as did Jim Flore from Italy.

Charnley: What crops were they interested in?

Dennis: These were all tree fruits. We had some students in veg crops from Zimbabwe. Bob Herner spent a sabbatical—well, actually it was more than a sabbatical; I think he spent a year and a half there on a US-AID project to beef up their horticulture department. And so as a result of that contact, there were several students from Zimbabwe.

Beginning in 1981, I think, we had the first Chinese scholars here in horticulture. Two women came from China. At the time they were not supposed to get degrees because that elevates you above the populace. So they were here just to do research, but they and the people that sent them realized at the time that it would be better to have them take courses and really get a Ph.D., master's, or whatever. But that was our first group from China. Of course, now we've had many students from China.

Interesting thing about it, although the first scholars returned, I don't think any of the students have returned to China; maybe one or two. But, of course, when you compare what the possibilities are here with the possibilities in China, no question. I know that my student said that if he went back to China, he'd be at the end of the line in terms of promotion; that the people

who had stayed there, even though they didn't have advanced degrees, would be more in line for promotion.

Charnley: Were they in fruit culture also, or was it all areas?

Dennis: The people I spoke of were in fruit, but they were in all areas. Less so in ornamentals; they were in vegetable crops and tree fruits, primarily.

Charnley: You had an overseas experience as a beginning professor. Your students, did they do anything similar like that, take overseas assignments or do overseas research?

Dennis: The one I spoke of, Gene Mielke, did some short-term work in Mexico. In fact, I went there with him one time.

I should mention, in terms of international things, I was one of the organizers of a so-called working group on temperate-zone fruits in the tropics and subtropics as a part of the International Society for Horticultural Science (ISHS). The Society meets every 4 years, and I went to a meeting in Hamburg, W. Germany, in 1982.

While there, I met a group of people, all of whom were interested in the production of temperate-zone fruits in the tropics and subtropics, so we formed a working group. The situation, background, on that is, as I mentioned, these temperate-zone fruits cannot be grown in the tropics, with exceptions, because they don't receive the required chilling period. However, under certain circumstances, certain climatic conditions, they can be grown there. For example, in Venezuela they grow peaches. What they do is defoliate them after harvest and within the

next month or so the leaves come out again. They can produce another crop, and they get two crops a year. The same can be done with apples in certain areas and, with grapes. They were growing as many as three crops of grapes a year in Venezuela. They do this in the southern part of India. A number of areas have the right climatic conditions so that they can grow these fruits.

We had conferences, workshops in a number of countries. The first one was in Addis Ababa, Ethiopia, when the Communist government was still in power there.

Charnley: The early eighties?

Dennis: In January 1984. And we had later meetings in Venezuela, Australia, Mexico, India, and Turkey.

Charnley: And you went to almost all of them?

Dennis: I went to many. As I say, I was chair of this working group and printed a newsletter and to kept people in touch. So that was a very interesting experience for me.

Charnley: So that work continued or the crops are being grown?

Dennis: Yes. Egypt was another one. The working group continues. When I retired from MSU, I retired from the working group. I guess I went to one more in Turkey. But that continues under different chairmanship. So I have always been pleased that that was done. It

doesn't make a big dent in terms of economics, but it does provide income for small farmers income in these countries.

Charnley: I think in some of the materials that I looked at, you had been in Jamaica. Can you talk a little bit about that?

Dennis: I took a sabbatical in Jamaica in 1983. I've always been interested in developing countries. At one time I thought about being an agricultural missionary, but I decided that was too narrow an approach, and so, as I say, I had interest in this kind of thing.

So for that sabbatical I learned that they were in need of instructors at a college that had just been opened in Jamaica. Don Wilson, a Jamaican who got a Ph.D. here in education, told me about this college. So I took a six-month sabbatical there.

The bottom line there was it was very interesting, but very frustrating. The Jamaica School of Agriculture, which had been in business for many years, I don't know just how many, near Kingston, had been closed down by the government. The previous prime minister, Michael Manley, had been a leftist, and there were leftists, supposedly, in the faculty of the Jamaica School of Agriculture. When the conservative government came into power, they decided they were going to close down the Jamaica School of Agriculture, which they did.

Buildings had been built on the north coast with the help of USAID. This was to be a secondary agricultural school, but the government decided, "Well, that's available. We'll use that for this college." So they moved the students over there, with very few instructors. People were commuting from the Department of Education in Kingston over the hills to teach there, but the students were very unhappy with the situation, so they struck. Making a long story short,

(which is difficult for me) they kicked them out, except for a few students who were not there, but were out on internships.

So I taught the students who had been out on internships. The others were new students. The dean, who was Jamaican, was very dictatorial, and the students didn't like that. It was a very, very poor atmosphere, but I enjoyed being there. I learned a lot about tropical agriculture and particularly ornamental horticulture. I was teaching ornamental horticulture, which I knew nothing about, so I had to stay one jump ahead of the students. In fact, I had to memorize these Latin names and they were better at it then I was. They were used to memorizing. But, as I said, it was very interesting, but not very rewarding in that sense.

Charnley: In staying ahead of the students in ornamental, when you came back here did that help you a little bit?

Dennis: Except that these were mainly tropical ornamentals.

Charnley: Doesn't much good in Michigan.

Dennis: Yes. Poinsettia, I guess you'd call it a subtropical ornamental. So some of them were common plants, but most of them are tropical.

Charnley: In terms of the years that you were here, the international experience, both encouraging faculty and also students that exchange, seemed to place Michigan State in an important area almost worldwide. You were a part of that in terms of the research and

international students that you taught. Did you teach any study abroad where you taught MSU students there or at a different location?

Dennis: No. My wife was working in study-abroad programs at one time, so I went with her to England one summer with a group of MSU students. I spent my time in libraries collecting information for a paper I was writing. I had some experience with that.

I made a number of visit here and there. In Ecuador I met a Venezuelan who was interested in the production of naranjilla (*Solanum quitoense).* Naranjilla is Spanish for "little orange," but it is a solanaceous plant in the tomato family that is grown by natives, mainly in Ecuador and Peru. It has market potential, but no much was known about how to grow it. So we put our heads together and organized a conference in Quitu, Ecuador in 1982. This was supported by NSF, on *naranjilla*, and we had some very good people there. One was an American who lived in Mexico, but he'd worked with *naranjilla* for Campbell Soup Company because they were interested in its commercial potential.

[Begin Tape 2, Side A]

Charnley: This is tape two of the Frank Dennis interview.

When the last tape ended, we were talking about *naranjilla*. Would you continue your points about that?

Dennis: One of the men who attended this conference was an American who then, and probably still, lives in Guatemala, but he worked for the Campbell Soup Company, and he had made a

number of tests of these fruits that could be combined for making juice, *naranjilla* made a very good juice in combination some other fruits.

He had grown six hundred hectares of *naranjilla* for testing for juice. So he was very knowledgeable. But he commented that Campbell Soup was ready to go with this, and they had even printed labels for the cans, and he brought one with him, but at the last minute they decided they couldn't get enough of it, and so they cancelled the whole project. But as I say, he was a very good source of information.

So we had the first international conference on *naranjilla*. Unfortunately, the Venezuelan who was working in Ecuador, his job terminated, went back to Venezuela, and that was the end of the whole project. So I was always sorry that we didn't follow that up.

Charnley: Looking at changes, you'd mentioned a little bit about the changes within the Department at that time. Was there any curricular change in terms of orientation toward both teaching and research or how students learned?

Dennis: I have to think about that. I was graduate program committee chair at one time and chair of the curriculum committee. This is more personal—when I came, I started teaching a course in pomology, tree fruits, which had not been taught for a couple of years. Then later I team taught a graduate course in growth and development, which involved not just hormones, but plant growth and development and mainly hormone physiology, that had not been taught. Pardon me. It was being taught. August ("Gus") De Hertogh had taught it with several other people, but the other people had vanished from the scene, and so he was about to give up, and I said, "Okay, well, I'll teach that with you."

The Department offered a plant propagation course, and I agreed to take part of that. It had been taught by two people, one who was more woody-plant oriented, one who was more tree-fruit oriented. So I was the tree-fruit man. Then there was also a small fruits course, small fruits being grapes, raspberries, strawberries, blueberries. So we had two fruit courses and one propagation course.

I can't remember now whether this came before or after, but I think this came after the repeat of CRUE [Council on Review of Undergraduate Education] committee. We had to cut back on courses, as we went from quarters to semesters. Theoretically you had to cut from three to two, or go back to two-thirds. So we combined the tree and small fruits course. The propagation course was rolled into a two-term horticulture course, beginning horticulture. We still got down to the two out of the three, but we eliminated a number of courses, combined them with other courses.

In terms of changes other than that, Jack Kelly was our new chair after Carew. He had gotten his B.S. and M.S. here at Michigan State, then worked with the Campbell Soup Company. He was chair of the vegetable crops department in Florida at the time, but he interviewed for the job here and was chosen as chair in '78. He taught a large part of this introductory horticulture course, because he wanted to keep a finger in teaching.

The CRUE, I always think of as CRUE report—

Charnley: Council on Review of Undergraduate Education.

Dennis: Thank you. That brought in a number of changes. I taught a senior seminar. I should mention that when I came, we had something like eighty majors. By the late-seventies, we had

five hundred majors. I always attributed it to my wonderful lecturing, but it had nothing to do with it. It was the green revolution, an agricultural revolution maybe. This is slightly off the subject, but we decided that with all of those students we needed to have some preparation for getting jobs. So I taught a senior seminar for students who were going to be leaving, and brought in people from placement services and industry and whatever to talk to them about how to find a job.

When our numbers dropped, that course was dropped, but a new senior capstone was taught by Will Carlson. Theoretically there were capstone courses for each department, each college, university, so on. Now, I'm not sure just what has happened to it. I know some of them have been dropped. But that was a change in curriculum.

Charnley: I know that shift occurred—in 1992 was when that change actually was—

Dennis: Yes. We still had to drop a few courses or combine them.

But anyway, in the, let's call it mid-eighties, there was an interest in the college in going back to international courses and international programs. We hired Harry "Skip" Bittenbender to be our international horticultural person. So he taught our courses in tropical fruits and tropical vegetables.

I might mention that I taught a course in tropical fruits and Bob Herner taught a course in tropical vegetables. This was given intermittently, but Skip took those over and also made contacts with a lot of graduates in other countries. His research was on crops that could be grown in the tropics. He did some overseas research, too. In fact, much of his graduate work, was done abroad. So that was a change in terms of curriculum. He's now in Hawaii.

Charnley: Did many of your students come from backgrounds, let's say in Michigan, from orchard families?

Dennis: Yes, many of the students in tree and small fruits were from Michigan families. In New York we grew some plums, but not many of them. I was talking about plums in a lecture, and a senior from Hart-Shelby – Bruce Fox – was in the class. The introductory tree fruits couse had not been offered in several years, so Bruce had not taken it. He was very knowledgeable, but decided to take it to see if he had missed anything. He asked me "What about Damson plums?" (Damsons are a small plum that is made into jam.)

I said, "Damson plums don't amount to anything. Nobody grows Damson plums."

He said, "Oh, yeah? We've got sixty acres." [laughter] So I learned at that point that Michigan grew some Damson plums.

I offered oral finals in the course, so he took the oral final and he did very well. I told him, "You got a 95." "And just out of curiosity, how long did you study for this?"

He said, "About five minutes." [laughter]

Charnley: So it sounds like he'd been studying all his life on the farm or in the orchard.

Dennis: So how much he got out of the course, I don't know.

Charnley: In your teaching career here, you were long enough did you have two generations, let's say, for example?

Dennis: I taught the tree fruits course with George Kessler when I started out, and I was always amused that George would say to somebody, "Oh, you're Sam Smith. Well, your father was Joe, wasn't he? I taught him here." I thought he must have been here a long time, but I was doing the same thing by the end of the course. Bruce Fox's son was in my course.

Charnley: You didn't tell his son that story about his dad, did you?

Dennis: Yes, I did.

Charnley: Were they still raising Damson plums?

Dennis: I think so. I'm not sure, but I think so.

Charnley: I know that you're interviewing your colleagues, you're doing it personally for the Department or are you just doing it—

Dennis: No, it's for the Department. I am writing a history of the Department. I have been historian, photographer, and poet for the department. So whenever somebody retires, I write a poem. Dave Dilley has retired and we're having a party for him on Friday, so I'm working on a poem right now for him.

Charnley: Have you collected all these poems as part of your work?

Dennis: Yes. Not as work—just fun.

Charnley: And photography, have you gotten into that in terms of—did you do that in your research?

Dennis: Research, but I've also taken pictures at parties and in the field and so on and so forth.

Charnley: How have you found your oral history work in talking with a lot of the members?

Dennis: Time-consuming. I've interviewed about thirty department members, and what I do is to take notes while I'm taping, then type up my notes, triple-space it, go back and listen to the tape and fill in the blanks, of which there are many. I just can't take notes fast enough. So it takes a great deal of time to do that. I don't try to make it verbatim, but I try to get the facts, so to speak. And then I give the speakers the transcript, double-spaced, and ask them to look it over and make corrections, so that the final transcript differs considerably from the tape itself.

Charnley: Yes, that's understandable. Are there any of those interviews that stand out, that either you learned a lot or you're surprised or—

Dennis: Most of these are sixty-minute tapes, I think. John Bukovac took three tapes. You may or may not know John, but he's a very particular, precise person, so he had quite a few notes that he used in making the tapes, and he had a lot to say about, not only the Department, but about the

American Society for Horticultural Science, of which he was president at one time, the college, the industry. Not just his personal life.

Long ago I interviewed V.R. Gardner, who was head of the Department in the twenties. He came in 1928. He stepped down as head when Tukey became chair in 1945, but he remained Director of the Experiment Station, and he retired about ’48 or ’49. But he lived in Florida and he was about ninety when I taped him.

It’s been interesting to me to see what people have done and what they emphasize. I think of Bukovac as being an outstanding one, but all of them have been interesting.

Charnley: In looking at, let’s say, the last fifty years since the centennial in 1955, how would you say, at least, but also from your own personal experience in the late sixties when you came, how would you say that the last fifty years has affected the horticultural department and research on campus?

Dennis: The thing that I mentioned before is that there is a shift from pomology to ornamentals, particularly, some to veg crops. Veg crops tended to be shortchanged in terms of staff members in relation to the value of the crop, but ornamentals have increased considerably in value and there has been a shift, probably not proportional even now.

One thing that is dramatically different is funding; the department is much more dependent on outside funding now. I’m not absolutely sure of this, but I think much of this has happened since Jack Kelly became chair about ’78, and somewhere I have the figures. Grants to the department, not only including grants—that is, fruit growers, vegetable growers, etc.—have

increased, but NSF, NIH [National Institutes of Health] and so on, grants have increased markedly, probably 500 percent, I would guess.

The floriculture industry has provided considerable funding. That was the result of an initiative from several Department members, Will Carlson, Art Cameron, and others. I should add Royal [D.] Heins. Royal Heins was a very effective researcher.

What they did was to approach the floriculture industry and say, "What do you need?" and then try to meet their requirements in terms of research. They started several years ago. They had a large donation from the bedding plant growers. They started a project in which they began growing perennials as annuals, and they were looking at all the factors that influence growth and flowering. So they looked at day length and temperature and nutrition and whatever else might be manipulated, and showed that many of these plants were photoperiodic. You could either induce flowering, if you wanted to induce flowering, or delay it, by certain photoperiods, and/or temperature regimes. Now they can produce some perennial plants in the greenhouse. With bedding plants it's best to have them in flower when they're sold so that the customer can see what he or she is getting. So this allows them to induce these plants to flower at the right time.

I could go on about Royal Heins. He really did some excellent work.

Charnley: Is he still living?

Dennis: Yes. He retired at the ripe old age of fifty-five. Maybe fifty. He's sort of like Liberty Hyde Bailey. It will be interesting seeing what he's going to do. We had a party for him last year.

Charnley: In looking at your career since you got here, did you anticipate when you came that you would end up staying here at Michigan State for the rest of your career?

Dennis: I expected to stay here. I had queries about whether I'd like to be a department chair here or there, but I never thought that I would care for administrative duties, so I never applied for those. I have enjoyed the teaching and research that I did, and I may have gotten stuck in a rut. I remember hearing a man from Ohio State; he never stayed in one place more than fifteen years or whatever it was, because you get in a rut. But a lot of us are in a rut, I guess, if that's the case.

Charnley: When did you retire?

Dennis: '96. Upon retirement, I took a job as editor of a journal for the American Society for Horticultural Science; *HortScience* is the title. I talked with the editor who was retiring and I asked him about the job and he said, "It takes me about ten hours a week." I soon found out I took about twenty hours a week instead of ten hours a week, but that's probably because I'm a compulsive editor. But he is, too. So when I confronted him with the fact that I was taking that long, he said, "Maybe it was longer than ten hours."

Charnley: And you've continued that since '96?

Dennis: No, I did it for four years and I decided that was enough. I needed to do some work on a departmental history, and was also working on the history of my hometown and editing a newsletter for the town of Rose in Upstate New York. My sisters still live there.

Charnley: So you get back occasionally?

Dennis: Yes, we were back there last week. We're now doing a cemetery project, photographing all the tombstones in the cemetery.

Charnley: DAR did that, I know, lots of times around the turn of the century, and that's important because of the vandalism, local history.

Dennis: We are fortunate now that we have digital cameras. You can take about two hundred pictures without relocating.

Charnley: And you can print only the ones you need.

Dennis: The guy that suggested this project lives in California. He had ancestors from the town of Rose, so I'm going to send them to him to sort out.

Charnley: Interesting. In looking back at your career, both in New York and also here in Michigan State, is there anything, in reflecting on that, that you see as most important, at least from your point of view?

Dennis: Most important?

Charnley: I know that's a tough question.

Dennis: Yes. I didn't consider my research career to be particularly successful. There were a few high points. But I operated on the basis of the null hypothesis, if that means anything to you, in that I was always testing the null hypothesis, and usually I found out the null hypothesis was true, which isn't very exciting. If abscisic acid isn't responsible for dormancy, well, what is? What's new and different?

But I always enjoyed the work. I particularly liked fieldwork. I am not, was not, a very good mechanic, and during my lifetime, or my scientific career, mechanics became more important. We went from bioassays to column chromatography, to gas chromatography, to high performance liquid chromatography (HPLC), to gas chromatography-mass spectrometry, and I just never was very good at these techniques. Fortunately, I had some good students who knew the way to do things. So I wouldn't call that a disappointment; it's just a fact, I guess that some people are very good with instrumentation. Dave Dilly is a good instrumentation man. But that wasn't my forte.

Charnley: But the fieldwork sounds like it was.

Dennis: Fieldwork. I wrote a number of review articles that I enjoyed writing, I consider that contributed to the scientific area. I enjoyed the teaching that I did, and the graduate students that I worked with.

Charnley: Do you remember approximately how many master's or Ph.D. students that you worked with?

Dennis: I probably had eight master's candidates and ten, twelve Ph.D.'s. It wasn't a large number.

Charnley: Any activities since your retirement that you were involved in the local community?

Dennis: I do church work, if you want to call it that. I'm chair of a hunger task force which sponsors Thanksgiving basket drives and can drives and so on and so forth. I chair a board of Church in Society, which is responsible for benevolence, gifts to various organizations.

Charnley: What church is that?

Dennis: This is Edgewood United Church in East Lansing. I've gotten involved in the antiwar movement since the Iraq war. There's a group called the—well, it *was* called Greater Lansing Network Against War in Iraq, but after the Iraq war began, we had to change our name to the Great Lansing Network Against War and Injustice. So I found that rewarding, frustrating maybe, but rewarding. We've done some investigation of the Palestine-Israeli problem. We had

a couple of speakers, one representing each group the other night. I don't know whether we will do more or not, but we had demonstrations, marches.

Charnley: Are there any other things that you want to talk about in this interview that you'd care to share or any big question that I forgot to ask?

Dennis: I'd have to go back and think about these things. I think I've covered most everything. I served briefly on Academic Council, and the University Curriculum Committee. One of my major contributions there was editing, I think, because we would have these motions to something or other. In the Curriculum Committee there would be a discussion—not a discussion, but a description of the course--and there were always objections or suggestions and so on. "Well, does this really mean this or does it mean that?" And I think I contributed something there in terms of straightening out the terminology.

Charnley: In university governance.

Dennis: Right, university governance. I didn't have a great role in that, but just part-time.

Charnley: That's an important part of one's academic career, that's for sure. And you've seen a lot of governance changes on the campus since you've been here, too.

Dennis: Yes.

Charnley: On behalf of the project, I'd like to thank you for the time and especially for your insights. I appreciate it very much.

Dennis: You're welcome.

[End of interview]

Index

Adams, Walter, 21

Balboa, Orlando, 28
Ban, Jun, 29
Bittenbender, Harry, 39
Bonamy, Prince, 28
Bukovac, Dr. M. John, 14, 15, 17, 25, 31, 42, 43

Cameron, Art, 44
Carew, H. John, 15, 38
Carlson, Will, 39, 44

De Hertogh, August, 37.
Dennis, Frank
- As member of Academic Council, 49
- As member of University Curriculum Committee, 49
- As oral historian, 42, 46
- As photographer, 42, 46
- As poet, 41
- Committee membership at Michigan State University, 37
- Early years, 1, 4
- Editor of HortScience (journal), 45
- Educational background, 4, 5, 6, 7, 10
- Joins Michigan State University in 1968, 15
- Member of International for Horticulture Science Society, 33
- Receives National Science Foundation fellowship, 10
- Research, 22, 23, 24, 26, 27, 28, 29, 30
- Retirement, 33, 45, 48
- Sabbatical in England (1974-75), 29
- Sabbatical in Jamaica (1983), 34, 35
- Teaching duties at Michigan State University, 37, 38, 39
- Wife of, 8, 10, 19, 36
- Work background, 8, 11, 13, 14

Dilley, Dave, 41, 47

Edinger, Paul, 6

Flore, Jim, 31
Fox, Bruce, 40

Gardner, V.R., 24, 43

Hannah, John A., 21
Hannet, Charlotte, 5
Heins, Royal D., 44
Herner, Bob, 31

Kelly, Jack, 38, 43
Kessler, George, 41

MacMillan, Jake, 29

Martin, George, 30
Malchoff, Celestine, 6
Manley, Michael, 34
Merrell, Katharine, 8
Michigan State University
  Changes in horticultural department in last fifty years, 43
  Changes in horticulture department curriculum, 37, 38, 39
  Class size in horticultural department, 18
  Grants from NSF and NIH, 43
  Increase in majors, 38
  International programs, 39
  International students in horticulture department, 31, 32
  Mood on campus in 1968, 20
  Relationship with state orchards lists, 25
Mielke, Eugene, 28, 32

Neilsen, John, 29
Nitsch, Jean, 11

Smith, Mabel, 6
Smock, Bob, 9

Tukey, Dr. Harold, 15, 16, 17, 18, 43

Wharton, Clifton R. Jr., 22
Wilson, Don, 34
Wittwer, Sylvan H., 15