



Ron Wrolstad Oral History Interview, December 14, 2015

Title

“A Life in Food Science”

Date

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Location

Valley Library, Oregon State University.

Summary

In the interview, Wrolstad discusses his upbringing on a turkey farm near Molalla, Oregon, his experience of school growing up, and his decision to attend Oregon State College. In reflecting on his OSC years, Wrolstad touches upon his academic progression in Food Science and Technology, and his social activities. He then shares his institutional knowledge of the history of maraschino cherry development at Oregon State, noting the major contributions of Ernest Wiegand and mentioning his own work on the use of radish extract as a natural colorant. Returning to memories of his undergraduate years, Wrolstad comments on his involvement with Alpha Gamma Rho fraternity and the OSC Rally Committee, and reflects on his sense of campus culture during the late 1950s.

Wrolstad next provides an overview of his graduate school experience at UC - Davis, remarking on individuals who made an impact on him, and outlining the research that he conducted while a doctoral candidate. He then describes his year abroad as a post-doctoral fellow at the Unilever Research Laboratory in Bedford, England.

The remainder of the session is chiefly devoted to Wrolstad's activities as a member of the OSU Food Science and Technology faculty. In this, he discusses the circumstances by which he returned to OSU, settling in as a faculty member, and struggling to build a funding base for his research. He likewise details several of the research projects that he led, including work on the color of strawberry jam, an important program of research on fruit juice adulteration, and later investigations on the phytochemical composition and antioxidant properties of fruits and vegetables. He also touches upon his relationship with Australia and New Zealand, and mentions additional research that he has led on natural colorants.

The interview concludes with notes on teaching, Wrolstad's perspective on change within the Food Science and Technology department, and his sense of OSU's direction as it looks toward its 150th birthday.

Interviewee

Ron Wrolstad

Interviewer

Chris Petersen

Website

<http://scarc.library.oregonstate.edu/oh150/wrolstad/>

Transcript

Chris Petersen: Alright, so today is December 14th, 2015. We are in the Valley Library with Ron Wrolstad, who is a Distinguished Emeritus Professor of Food Science and Technology here at OSU, and also an alumnus. And we'll talk a lot about his connection with OSU, but I'd like to begin at the beginning and ask you where were you born?

Ron Wrolstad: Molalla, Oregon.

CP: Is that where you grew up?

RW: Yeah, I grew up on a farm in Molalla; actually my birthplace was Oregon City, Oregon, in terms of the hospital.

CP: And what was your family background?

RW: Well, my father general farmed – turkeys were the major enterprise – and my mother a school teacher.

CP: So the farm that you grew up on was a turkey farm?

RW: Yeah. That was the major enterprise, but we also grew different crops from barley, wheat, corn, and we had beef cattle, we had sheep.

CP: So what kinds of jobs did you get assigned, growing up on the farm?

RW: Well, turkeys provide a lot of jobs. I had two brothers and so there were three of us picking up eggs. The turkeys start laying in December through March to April. They fool the birds by stringing lights up, so the birds think its spring. They breed, then you collect the fertile eggs, and either the fertile eggs or the poults are shipped back to the Midwest, Minnesota and so on, where the feed is cheaper. And so the major enterprise was selling fertilized eggs or young poults. And so eggs had to be picked up on the hour, through the rain, the slop and mud. That's a great one.

But there were lots of things. Making hay and doing that. And then of course, like most people of my generation in the Willamette Valley, school was out, you picked strawberries and you picked cherries and you picked raspberries and you picked beans and you picked hops, and did that all through the summer.

CP: Where was town, when you would go to town? Was it Molalla?

RW: Well yes, but we were sort of midway between Molalla, Mount Angel, Canby, and Silverton. My parents probably went to Canby more than they did to Molalla, for shopping, also to Woodburn. Those were the principle areas. And then, of course, Portland. That was the treat, when we would go to the city.

CP: Was there much of an experience of community life for you growing up in a rural area?

RW: Oh, heavens yes. Heavens yes, because I grew up – my grandparents founded the Yoder Store, 100 years ago this summer, and there were nine in the family and so aunts and uncles, cousins, two room schoolhouse. I grew up with certainly an extended family. Cousins that were like sisters and brothers, and you saw them – you went to school with them, you took music lessons with them, you went to Sunday School with them, and you had your holiday meals together. So definitely an extended family.

CP: What were you interested in, growing up?

RW: What was I interested in? Well, I suppose lots of things. I always was a reader, I liked to read. I always liked – on a farm, yes, there were the dogs and the animals and we could explore through the woods and down to the river, and all of that was fun. And piano – I had piano lessons and I liked playing the piano.

CP: Were there horses on the farm?

RW: No. And that's a sore point because I wanted a horse badly. And my cousins had one and I would go down and ride theirs, and my parents said "absolutely no." But when my younger brother, seven years younger, when he wanted a horse – boom, they got a horse. So that was sort of a sore point with me.

CP: Were you involved with anything that we associate with Extension now?

RW: 4-H. We went through 4-H and then in high school it was FFA.

CP: Any standout memories from that experience?

RW: Well, the county fair. Pulling up everything from the garden to take and display at the county fair. Camp cookery, baking hundreds and hundreds of baking powder biscuits to display in the fair. Yeah, that was fun. Along with that then went summer camp – Camp Colton – for a week, when we were young. That was a big deal for me.

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CP: What was school like, growing up? You mentioned the two room schoolhouse.

RW: Two room schoolhouse.

CP: Was that all the way through?

RW: Yeah. I never officially took the first grade, because my mother went back to teaching when I was five and took me along, so basically I did the first grade. And it was a one room schoolhouse. A one room schoolhouse – Needy, was the name of the district – with the fifth through eighth grade came in the morning and the first through fourth came in the afternoon, is the way that she taught that school. Then I started second grade at the appropriate school where I was supposed to be going. But the same teacher for three years and then another teacher for four years. There are good things and bad things about it – they were not bad teachers but, from an educational standpoint, I just think having one teacher for four years is not really good for a child. You really need more experiences, you need diversity and not just the viewpoint of one person.

But we had a lot of independence because the last three years there was just myself and Janice Rautenberg in that grade. And we were good students, and so basically the teacher let us do art and so we would spend half the day doing art projects of thing or another. And some of it was creative; we would write plays. Rather than taking the regular school plays, she would say, "Janice and Ronnie, you write a play and we'll put it on." So there was some creativity.

CP: So you said "the last three years," is that the last three years of high school? Or of middle school?

RW: No, this would have been – see, there were eight grades in the school. So fifth through eighth grade, it was the same teacher, but we had more in the fifth grade and then there was a consolidation and some of the classmates moved out of the district and chose to go to a different consolidated school.

CP: And where did you go to high school?

RW: Molalla Union High School. Graduated in 1956.

CP: Was that an adjustment, coming from a class of two?

RW: I couldn't wait to go to high school and absolutely loved it, just thrived on high school. We had almost 500 students in the school, so this was big stuff.

CP: For sure. Did you always anticipate going to college?

RW: I did. Part of this is modeling from cousins, because within our community, none of my aunts or uncles went to college. Well, my mother, she eventually got a bachelor's degree, but she had a lifetime – she went to Monmouth Normal School when she was eighteen, and one summer session, then she got a lifetime teaching certificate. And she went out and

taught school when she was eighteen, and then went back for additional summers. And on her own, she eventually got her bachelor's degree, and some of that was through television courses here at Oregon State, where she completed her degree.

But my cousins Mary and Helen, they went to Oregon State, and Helen's eight years older than I am. And I just assumed that I would be going also to college.

CP: To Oregon State?

RW: Yeah, and my older brother went, so that was just a pattern that was sort of assumed.

CP: So OSC, as it was at the time, was a natural fit for you then, because you'd had other family who had gone there?

RW: It was. However, I actually had applied and was going to go to the U of O, and I changed my mind, just about high school graduation, to come to Oregon State.

CP: Do you remember why?

RW: Probably a lot of friends were coming to Oregon State, was one. And I knew my parents, they didn't disapprove of my going to U of O, but I knew that they didn't want to go there, they didn't want me to go to that country club party school. They wanted me to go to Oregon State, where my brother went and where all my cousins went.

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CP: Do you remember much about your early impressions of college and of Corvallis?

RW: One of my first impressions is 4-H Summer School. We were put on a bus in Oregon City, Clackamas County, and we all came down, and it was a week or ten days. But I remember the bus coming into Corvallis and the fraternity and sorority houses. And I thought, "boy, these professors really live in some nice, big houses," [laughs] I thought they were professors' homes, coming up Harrison.

CP: Was it an easy adjustment to college for you?

RW: Yes. Adjustment to college was very easy and I can probably thank the previous Molalla High School class, where many came down to Oregon State – including the valedictorian, the salutatorian, all this – and fall term, they were almost all on probation. And so our high school teachers really laid it to us on preparation for college. And so, coming down, I was probably a little bit scared and I just studied and studied, and I was 3.89 that first term and honor roll, certainly all through that first year.

CP: Did you decide on Food Science pretty early on?

RW: No. I was in Science Education, is what I was majoring in, thinking I was going to teach biology and speech, because I loved speech. My advisor, Fred Fox, had me take chemistry the first year, rather than putting me in biology, get your foundation in chemistry, and I did well at it. I did well at it and liked it, and I had friends that were in Food Technology. And they said, "you're doing a lot of chemistry, you should consider Food Tech." And so I went over and talked to Cliff Samuels, and ended up transferring in my sophomore year.

CP: So it was largely because you had friends in Food Science? That was kind of the hook?

RW: Probably. That was the major connection, was they were friends. And essentially I liked chemistry but I liked applied practical problem-solving chemistry rather than fundamental theoretical.

CP: And I'm guessing your agricultural background also played into this.

RW: Yeah, agricultural background fit in. I was familiar working with food and had actually worked in a dairy processing plant and all of that, so it was familiar ground.

CP: Do you remember much about the curriculum from your undergraduate days?

RW: Oh yes, the curriculum and the teachers. And the core of Food Science hasn't changed that much, it's basically applied chemistry, microbiology, and engineering. And, of course, it was chemistry that I liked the best out of that. So we had a curriculum with a lot of chemistry and I liked all of that, and at least three courses in microbiology. Then we had food processing courses, food engineering courses, and some of those courses I liked, some of them I didn't. But it was a good experience.

CP: And who were some of the professors or the classes that made an impact.

RW: Well, certainly Cliff Samuels, who was an advisor and taught what was then called "Food Science" and then I taught "Food Chemistry" for years. Actually, when Cliff Samuels died – tragically too young – then I was given the responsibility for teaching that series of courses, so I did that. But there was Cliff Samuels. Dietz, who was, I think, quite a, probably brilliant man. He was a MIT professor and I liked his classes, I thought he was very creative in giving us special projects.

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But other faculty were, like Tom Onsdorff, he knew a lot of practical things about food processing. I know that he had a daughter that was at Oregon State in, I think, the same class that I was. But all of us in Food Science were really bemused by him, because his office was stacked to the ceiling. And John Laroque, in particular, was one who would never turn in his lab reports. And he would go to Tom Onsdorff, and "I don't have your lab report. I can't seem to find your lab report." And he says, "oh Prof. Onsdorff, I turned it in. I turned it in," lying through his teeth. And he was, "oh, well, must be someplace there," [laughs] and let him go. So students took advantage of his good nature and his disorganization and things like that.

CP: You were involved with the Food Technologies Club?

RW: Sure. We all were, I think; everyone was.

CP: What were the sorts of activities?

RW: Oh, making cider. Making cider, selling cider, that was the major one. And then the big spring term field trip. So that one week of Spring Break, we would take a field trip down to northern California and visit food processing plants, connections with a lot of alumni working in the area. We would visit UC-Davis.

CP: Well, we've done over two-hundred interviews for this project and we have not talked to anybody in great length about the maraschino cherry, and I'd like to get a little bit of your knowledge about where the cherry was at, at this point; how it evolved at OSC.

RW: Alright.

CP: And I know you've taught a class about this, so you've got a lot to say.

RW: Yes, I've actually taught a class about this and, in fact, as emeritus professor, this last year, Russ Carrol put together a retiree speakers program, where they send it out to, particularly, Kiwanis Clubs, Rotary Clubs and so on, so I've given about four talks at different Rotaries on OSU and the maraschino cherry. So that's very familiar territory.

Now do you want to hear about the course? A little bit of the background on the course?

CP: Just any sort of institutional memory that you'd like to share about the cherry.

RW: OK. Well, in my talk to Rotaries and so on, and in class, one of the first things you say is that OSU's marketing department says that Oregon State is well-known for two things – one being the university that Linus Pauling is our most famous alumnus, people know that, and then they also know that the maraschino cherry was invented at Oregon State. And so I go through, is that true or is it false?

Products called the maraschino cherry existed before Prof. Wiegand, who came to the campus in the 1920, something like that. He came as a member of the faculty in Horticulture and to work with the food processing industry on fruit/vegetable processing. And he was quite a man, and the department building is named for Wiegand for good reasons. He was a great educator and scientist and outreach/Extension person. He did a lot for the food industry. And within four years, the department was formed – the second oldest department in the USA.

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The maraschino cherry came about in that period, in the '20s. The Willamette Valley, in particular, grew cherries, sweet cherries, a lot of them, and very high quality. But we were too far for fresh market sales – cherries are very fragile, so shipping them to the east coast is out of the question. So basically it was an industry of canning and dehydration, they were the two things they did with the cherries. And there was a surplus; what do you do with a surplus?

And so he was aware of maraschino cherries. And at that time, starting in, I think, the late 1800s, New York businessmen had toured the Mediterranean and they fell in love with marasca cherries, and this was really a brandied cherry. These were cherries that had been sulfided. In Italy and the Mediterranean regions, they put the cherries on screens, burn sulfur beneath it – sulfur is a preservative – and then these are put in barrels of sea water, then the cherries would be removed, washed – so that the sulfite brine would be removed and the salt brine – and then they added the marasca cherry liqueur. So the marasca cherry was a cherry brandy, basically, made in that area.

Well, the New York businessmen loved it and they started importing those cherries, and then it extended to they started importing the barrels of these cherries and manufacturing a maraschino cherry. We found a book – it was either late 1800s or early 1900s – that had a formula and recipe for maraschino cherries. So maraschino cherries did exist before Wiegand came on the scene. However, it was very unlike the maraschino that we have today.

But Wiegand saw the marketing opportunity for a brined cherry, and so this is where he systematically set out investigating and developing the brine for preserving the cherry – so variable pH, the bisulfite concentration. And a very ingenious thing that he did is adding calcium chloride. And whether or not it was his idea or whether it was a colleague – Professor Joslyn down at UC-Berkeley – the two of them started recommending processors – in California it was calcium chloride to canned tomatoes to make them firm. And Wiegand put the calcium chloride in the brined cherries, which made the cherry very firm and gave it a texture completely unlike the previous brined cherries that were slimy and soft, in Europe. And this firm cherry gives it that crunch and firm texture that we have, and it facilitated mechanical pitting for the product. So that brining process, which wasn't patented, it's still in place today. So the brined cherry manufacturers in the Willamette Valley and The Dalles, they're using basically that same formula that Wiegand developed.

Prohibition came into play too, because with Prohibition, there was no more using brandy. And so artificial colorants and the almond flavoring – there's not a standard of identity with maraschino cherries, you're not required to use almond extract, artificial or natural, but that's the flavor that's there that people instantly recognize as that for the maraschino cherry. But it was at that period of time that they came up with that flavoring formulation. And then, of course, the cherry is bleached by the bisulfide, so it's necessary to color it. And so the whole history of the series of different red dyes that were added to the maraschino cherry.

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So did he invent it or did he not? Well, without his process and formulations, the maraschino cherry today is completely different from that that predated Wiegand's time.

CP: Was this still a big deal at Oregon State when you were a student?

RW: We were certainly aware of it, and there was on-going research on maraschino cherries. This is the nature of research, there are always issues and stuff that need to be dealt with. So Professors Bob Cain, Darrell Beavers in particular, were doing a lot of research on maraschino cherries. In the '60s, you had mechanical harvesting, so there was bruising of the fruit, and that bruise was not bleached. And so Beavers, Cain, and Carl Payne developed a secondary bleaching process that would bleach that pigment. And, of course, that is used today. So certainly that's one thing that was continuing.

My involvement came actually just in the 1990s, where they wanted a natural colorant instead of an artificial one. And so our laboratory investigated the use of radish extract as a natural colorant for maraschino cherries, and that is being used today by Whole Foods and Ben & Jerry's, companies that do not want any artificial colorants, that is the colorant of choice. So I did get involved in the whole cherry project.

CP: That must have been fun for you, seventy years later.

RW: Yeah, it was. It was really a good project because the idea of the radish wasn't because the radish has a beautiful red color, it was actually, I was going through the literature and saw that other people had identified this particular anthocyanin pigment – pelargonidin, highly acetylated, highly sugared groups – and I looked at that and said, "that has to be quite stable," just because of my knowledge of chemistry, it has to be stable because of the acetylation and the number of glycol acidic groups, and also because it was pelargonidin-based, it should be an orange-red rather than a blueish-red. And, of course, the manufacturers didn't want a blueish-red, they wanted a match for Red #40, and we were able to do that. We are able to get a precise color match using the radish extract with the Red #40. So it was fun, a big success.

CP: What was social life like for you as an undergrad at Oregon State.

RW: Well, I was in a fraternity; the AGR fraternity. And yeah, it was very social, I loved it. House dances every term, so every fraternity and sorority, I think, had a house dance every term, one of them being a formal dance and the others being costume dances. It might be the Forester's Ball or it might be a western theme or what have you. We never did have a toga party, but some of them did, some houses did have the toga theme. And of course, the dances on campus – every term there would be a major dance with terrific bands coming and performing. Russ Morgan, Ray Conniff Singers, big nationally known bands would tour the different campuses, and typically in Gill Coliseum we'd have these big dances. Always one at Homecoming, and Sophomore Cotillion was another big one that the sophomore class put on. I forget which one spring term was, but there was a number of big dances on campus.

CP: Yeah, I've heard that from plenty of people; the dances were a really big deal.

RW: Yes.

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CP: You were also on the Rally Committee?

RW: Yes, how did you find that out? Yeah, I was on the Rally Committee. My wife and I have discussed this – "to thine own self be true." And we have differing opinions about what that means, and I tell her, "to thine own self be true" means, I was not true to myself in wanting to be on the rally squad. It was just not my personality. Yet I had this idea that I wanted to be a cheerleader; I was one in high school also. But here at Oregon State, I remember trying to be a cheerleader – and I looked very young, I looked like I was in high school, like fifteen or sixteen years of age – and I was never selected for it, but then I was given the opportunity to work on the Rally Committee. So I did that. My sophomore year, my job was to run the record player for the rally dancing girls, and then, I think my senior year I was chairman of the committee, and so we did the selection of the different cheerleaders.

CP: When you think back on your time, in the late '50s, at Oregon State, and you think about the culture of campus or the environment on campus, what are some things that come to mind? Just reflecting on Oregon State on kind of the more macro-level back then.

RW: Well, we didn't have the issues that we do today. And certainly it was a very white campus. Some of the first awareness that I have, even at that time, of what African Americans we had tended to be athletes. And I remember when Earnel Durden, a very prominent football player, was selected "Joe College," but he dated a girl from one of the sororities and she was kicked out of the sorority because she went out on a date with Earnel Durden. So, awful things that took place in terms of race discrimination. But the face of the campus – well, there were a number of international students, and I found that fascinating in my classes, having students from India, Asia, China, and so on. And, of course, that was in classes rather than being in the fraternities or sororities. The fraternities and sororities were pretty much Anglo.

But on the positive side of academic experiences, I really gained from that, and really enjoyed it. In Food Science, we had students from Puerto Rico and Australia and other places, and I always found that very interesting in expanding some horizons.

CP: At what point did you decide to go to grad school?

RW: Oh, certainly by my senior year, thinking about it my junior year. And again, Prof. Samuels, advisor, and also Dietz and Howard Schultz, the department head, really encouraged, "you need to go to graduate school, you should go to graduate school." And so I was eager to go.

CP: So you were angling towards and academic career at that point?

RW: No, not really. I knew I wanted to continue on beyond my bachelor's, but in fact, when I first started, I was thinking of getting a master's degree, and I wanted international work. I remember being very influenced by some alumni who came through and spoke at our club, who had worked with, I think, Coca-Cola International. And to me, their stories were fascinating. This one was presently in Australia, but he had been in Africa and other countries, and told about the experiences they had. And I thought, "oh, this is for me, that's what I want – get a master's degree and go to work for a company." So when I first started at Davis, that's what I was thinking of.

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CP: But, in fact, you did not get a master's degree, is that correct? You went straight into a Ph.D.?

RW: I didn't get a master's, no, because at that time UC-Davis was encouraging people to go straight on. And so after my first year, my major prof., George Stewart, the department head, encouraged me to switch from Food Science to go into the Ph.D. program in Ag Chemistry, and at that time they did not have a Ph.D. in Food Science, you had to elect Agricultural Chemistry or Biochemistry or Microbiology or Engineering as your field, rather than having more of a generalist view.

CP: How did you decide on Davis in the first place?

RW: There were actually two universities that I was interested in – UC-Davis and University of Wisconsin. And University of Wisconsin was probably because the Wrolstad family had come from Wisconsin, my grandparents, in the late 1800s, came from Wisconsin. And so there were a lot of relatives back there and we always heard a lot about Wisconsin, and I thought it sounded like a neat place to go.

But UC-Davis, I was familiar with it through spring field trip and also through the fraternity, because I had been to national conventions, I'd been to leadership workshops – every spring we'd have a workshop where we met at one of the west coast schools – and UC-Davis were standouts for being really, really good. They had just an outstanding fraternity with the student leaders and so on, they were very prominent on campus, and just great guys. So I knew a lot of them and that was an influence, I'm certain that was an influence. But also, people like Reese Vaughn, George Stewart, when they visited, there was just this open, friendly, relaxed atmosphere, and so I loved it.

And in these years too, going to California was very common. And graduating in a class of sixty, the number of graduates who headed down to California was a big proportion of the graduates. The girls, they were going, a lot of them to teaching jobs in the Bay Area, Monterrey area, but particularly northern California. And engineers, of course, to different engineering firms, IBM, but feeding into northern California. Other friends and people went to Berkeley for graduate school, and Davis was common for people in the agricultural sciences too. There were people from Food Science that had gone to Davis. Cliff Samuels grew up in northern California; certainly he was encouraging about going to Davis and he was one too that gave me the advice – also Ron Cameron, here on campus – "don't stay at Oregon State. Get away from Oregon State and go to another university." Because actually, they offered me a fellowship that was really quite good, to stay and get a Ph.D. at Oregon State. And no, I followed Cliff's advice and Ron Cameron's advice, it was time for me to leave.

CP: Take me through your Ph.D. experience at Davis.

RW: Well, it was very lucky, because I had just a fantastic major professor, Walt Jennings. And when I got the offer of an assistantship, the letter came and it just said, "you are offered an assistantship at UC-Davis, and your major professor would be Dr. Walter Jennings," and I didn't know him from anybody. And Al Day was a new faculty member and a very successful faculty member that worked in flavor chemistry here at OSU, and so I talked with him, with Al Day, and he says, "oh yes, I know Walt Jennings," and he just gave positive things. He didn't rave, he says, "oh yeah, very good chemist." And so I went down and I was actually his second Ph.D. student that he had, and he was just marvelous, as was his wife, Erica.

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So I was so influenced by this mentor, that was so terrific. He became extremely successful but, boy, I was fortunate to be there at the ground level with basically four students working in his lab, and he had the time for us, and he had the ability to allow us to test our own ideas and seek. I certainly tried to model, in my career, the different things that he did, from weekly meetings, and having them relaxed, where you just reported on what you did and what your issues were, what worked and what didn't work, and what you thought you would do next. And you would discuss it with the other fellow graduate students and lab techs and Jennings. It was just a very very good experience.

CP: And you did some research on black pepper, is that correct?

RW: Yes.

CP: How did you arrive at that topic?

RW: Well, I didn't arrive, that was that the thesis was to be, the assistantship was. He had this grant for working on some essential oils and spices, and that's what I was assigned. Certainly I had no idea in my mind as to what I wanted to work on, and so I was happy to be directed specifically, "this is what you're working on and this is the approach we're going to take." So that was fine with me.

CP: Was that your introduction to research, more or less?

RW: Yes, although I did a little bit as an undergraduate here. In fact, when I was an undergrad, one, I did a project under Dr. Dietz, who I mentioned, because I made a decision I'm going to graduate school, I wanted some laboratory experience, because my summer work opportunities had not been laboratory-related. So one, I worked in Al Anglemier's lab for at least a term, doing some analyses. But I did an independent project under Dietz' direction, for at least one or two terms. Nothing publishable, but I certainly wrote up a report on it. But it gave me the feeling of exploring and independent research to progress and carry things out and face roadblocks.

CP: Did you do any teaching at Davis?

RW: No I didn't. I was a research assistant and in Food Science, we really didn't have teaching assistantships, or we weren't assigned to teach. Whereas in the Chemistry department, of course, basically all of the Chemistry graduate students were teaching assistants. I wished I'd had, because I remember my first time through the prelims, I was so nervous, plus I was sick, plus I didn't do well. I failed the first time and had to go back and take them a second time. And I remember fellow graduate students telling me, "it's too bad that you didn't have the experience of being a teaching assistant, because you needed more experience standing before a group, answering questions, and explaining things. In particular, explaining the basics." And so I really felt that I'd have been better prepped, because a lot of the people who were in the same degree program as I, they had been teaching assistants. And I think they did a better job and they told me, "you'd be better at this if you'd have been a T.A." But it worked out.

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CP: You finished up at Davis and then you got a taste of that international life you had been seeking, right? You did a post-doc in England, is that correct?

RW: Yep.

CP: Can you tell me about that?

RW: Yeah. Well, mentor George Stewart, who was head of the Department of Food Science, tremendous man. And actually I was just burning to get some international work. In fact, my third year at Davis, my older brother was active in Rotary, up at Molalla, and he said the Rotary chapter wanted to sponsor me. They had an international study abroad program where you go for one year, and then you give talks at Rotary when you come back. And so I wanted to go to Norway, I wanted to do it, and they wanted to sponsor me. And major prof and Stewart said, "the timing is just wrong, Ron." This was before I had my prelims and he said, "this is not the time to do it." And these were the years, in the early '60s too, when getting fellowships in study abroad programs was relatively easy; a lot of people were doing it. And Stewart said, "no, don't do it. Wait for your post-doc and do your international work as a post-doctoral student." So, as much as I respected both Jennings and Stewart, I wasn't going to take an end run around them and insist that I leave and go on that year's Rotary trip to, say, Norway.

Well, I then started applying for fellowships, I applied for an NSF fellowship in Scotland. I had a professor at Berkeley, Harold Olcott, who had worked at this lab and helped me in recommending the laboratory, the people to go to, and putting forth my application. Well, it wasn't funded; I didn't get it. And this is when Stewart says, "well, I think I may be able to work out something with you." He had a good friend named George Gallagher who was director of research at Unilever's laboratories there in England. And he says, "he's been wanting to have faculty from UC-Davis come over and spend sabbaticals in their research facilities there," a tremendous facility with a thousand employees working at that laboratory; it was all food-based. So George, because I wanted to, he wrote to Gallagher and Unilever offered me a post-doc for a year. So I went.

CP: And what did you do?

RW: I worked in protein chemistry. And partly see, I went directly from a master's program into a Ph.D. program, and so my research experience was really limited to food flavor chemistry. And I wanted additional, and need additional, experience. I was only twenty-five years of age. So Unilever said they wanted me not to work in flavor chemistry, because their work in flavor chemistry could get into patent problems and issues if I were to come back to the states and work in flavor chemistry. They wanted me to work in something completely different. I was fine with that, to get some experience in something else.

CP: So by that point had you decided that you wanted to be a university professor?

RW: Basically I had.

CP: Because you were overseas; you were doing a little bit of the international stuff that had appealed to you earlier.

[0:49:53]

RW: Yeah. No, basically in my last year at Davis – and part of it was just my admiration for the profs in our department, their lives, the way they lived, I had such respect for them that, "no, this is what I want to do." In fact, Stewart, I think, was at first a little disappointed, because times were very different then, academic jobs were almost for the taking. Of the colleagues that I had at Davis, if you wanted an academic job, you basically got an academic job. Industry was quite disappointed in Davis because there was never Ph.D. candidates to work in General Foods or Pillsbury or some of their research organizations. All of the Ph.D.'s you're putting out are going to academic institutions or, in some cases, government labs, but not to industry. Well, Stewart thought I would be a good candidate for industry, so he was in some ways disappointed that I didn't head in that direction. Or he was at first.

CP: How was it that you came back to OSU?

RW: Well actually it happened with this Unilever assignment, because Unilever, in getting me a post-doc, or offering me a post-doc, part of the stipulation was that I not come back and work with a rival company, because of the exposure that I would have to the projects and everything that they were working with and that information. No, they did not want me to come back and work for General Foods or, well now Lipton is part of Unilever, but they didn't want me to work with a competing organization. So this will be appropriate provided you work in academia. And at that time, I had an offer from

Oregon State. Hal Schultz, the department head, said, "oh, we always had our eye on you for a faculty position, and yes, you do your post-doc there and you can come back here and join our faculty."

CP: So it had been waiting for you for a year?

RW: It was waiting for me.

CP: Wow.

RW: Times were different.

CP: What was it like coming back and being a colleague of people who had been teaching you, five years before?

RW: I had no problems with that really, because, one, at that stage, the department had gone through quite a tremendous growth, and so there were lots of post-docs and young faculty. Dick Scanlan – he was a graduate student at that time – Dick Scanlan and Don Bills, Leonard Libbey, Ted Sique [?], Bill Davidson, there must have been eight or nine of us that were graduate students/post-doc people, that were in the department. And older faculty, such as Cliff Samuels, couldn't be better. He was always a mentor and really welcomed me back. In fact, he had been encouraging, I think, Schultz to bring me back and get me on the faculty. This was before Affirmative Action, when faculty positions – this was the old boys network in hiring faculty.

CP: So it sounds like it was a pretty smooth transition back.

RW: Yeah, it was. It was nothing like it is today.

CP: Well, tell me about setting up a research program. You did some early work on the color of strawberry jam, is that correct?

RW: Yeah. Actually, when I first came back, I was to have been working under Al Day on flavor chemistry, and he wanted me working on fruits and vegetables and working collaboratively with the Horticulture department on a number of different projects. I walked into the department and asked to see Al Day, and they said, "well, he's not here anymore," he'd left. He left like a month or three weeks before I returned, and went with research director for International Flavors and Fragrances there in New Jersey and New York. So they said, "well, your supervisor's going to be Bob Lindsay, who was – I guess Bob Lindsay did have his Ph.D. at that time, but he was basically my generation.

[0:55:00]

So I wasn't too pleased with that and wasn't too pleased with the project I was working on, which was a butter flavor project. But I stuck with it and worked on it, but I let Prof. Jennings down in Davis – a few months, I went down there in the spring, to visit Davis and see friends and see him – and let him know, "no, I'm not all happy with the situation I have at Oregon State." Well, within about three weeks, I had an offer from University of Arizona. So this was in May and I went to Dr. Schultz and said I had the offer, then they made a counter offer for a tenure track position.

CP: So the initial position was something besides that, then.

RW: Yeah, the initial position was actually a post-doctoral position.

CP: Oh, ok.

RW: And that was not my understanding, although I didn't have it in writing. Because I thought I was going to be immediately teaching classes and so on. No, really the offer was not a tenure track position, so I wasn't happy with this. But with this came a tenure track position and I thought, "no, I've got to give Oregon State a better chance, getting to that." And so part of that position was, "we're not saying you can't do some flavor chemistry work, but we've got a lot of flavor chemists here in the department. And we really need work in" what was at that time "the fruit and vegetable section, with some more fundamental work on the chemistry and then also working collaboratively with Horticulture." So I was happy to do that.

And the first project I had was really a collaborative project with Horticulture on evaluating strawberries – a big crop at that time, very important in processing as well as agriculture – to work on trying to get chemical indices for quality factors which related to the quality of the processed product. And so I went into that and I was happy to do it, because I was going to be working with coloring pigments. I wouldn't be working with volatile compounds but I would be doing chromatography, which I loved, so it was a matter of different techniques of thin-layer chromatography, column paper and so on. And I got into it and liked it.

CP: Did Oregon State have a pretty robust infrastructure to enable you to do this kind of work, relatively speaking to other places like Davis?

RW: Oh, I think we were much poorer-funded. It was a period where the amount of money – I was assigned to that project and it basically paid my salary and laboratory supplies and equipment, and I got a \$250 blender from the Research Office, I remember getting that. But things were really quite limited. And in that period of time, there was still the concept, certainly within the industry in the state, "you're at Oregon State University, you're an Agricultural Experiment Station, you're there to serve us." And there wasn't the idea of grants or granting faculty money to do work on such things as the color of strawberry jam or some of these other applied problems. They really felt that, "we pay our taxes" and that the Oregon State Experiment Station should be funding. So no, money was very difficult to get with.

I did get a small grant from the Nutrition Foundation to do some work at that time, but otherwise, it was really scraping along. Some of my good fortune was in having graduate students who were funded by other sources.

[0:59:57]

CP: So your lab was funded indirectly by these people who were working for you?

RW: Yeah.

CP: Wow.

RW: Yeah, my first graduate student was David Heatherbell, still a good friend and colleague, who, I'm probably one or two years older than David. But he was from New Zealand and paid by the New Zealand government to get his Ph.D. And so all we needed to do was provide the laboratory space and equipment and supplies. And so, solvents and so on, that was pretty small money. And I did get a little money from an Experiment Station budget that would help buy some supplies. But getting equipment was something else, but eventually we did get a decent spectrophotometer, and we inherited a gas chromatograph, because the department had a lot of those from the research on flavor chemistry that we had. But funding was very tight and very difficult.

CP: Did it ever improve?

RW: Yeah, it did. It improved, but it took a long time. It really wasn't until – a major breakthrough was when USDA got competitive grants, because the funding was largely NIH and National Science Foundation, and it had to be related to public health. And so, within our department, Sinnhuber's group and the Toxicology group, they were well-funded, and they had very good research grants, establishing the cancer lab, the fisheries, the Sinnhuber Lab over that, and so on.

But getting money for the applied work that I was working in was very, very difficult. And as it turned out, the last ten years of our research, the focus really was on antioxidant properties and health benefits of anthocyanin pigments, phenolics, and these compounds in fruits and vegetables. Well, today everyone accepts that this is healthy. I remember when I was turned down by the Research Office – and this would have been, I think, in the '80s – we were desperate for an HPLC, and first we got one on a lease program where we had a lease for one year. We tried to get it for a second year; I remember applying to the Research Office, it had a special fund that came through NIH and we were working on phenolics, anthocyanins, and all this stuff. "No. Your research is not health related." They did not accept that food, things that we eat, knowing the composition had anything to do with public health. So that's still a thorn in my side.

CP: How would you go about identifying topics of things to focus on? It sounds like the original work with strawberries was partly through conversations with Horticulture – was that sort of the model that you followed?

RW: Yeah, and it was really directed. At that time, our department was divided into sections – Bob Cain was head of the fruit and vegetable section – and the Experiment Station would direct: "We've got this issue on strawberries and we need to have an Experiment Station project that's collaborative with," I think George Varseveld worked on the processing aspect of the fruit, Francis Lawrence was a plant breeder working with the strawberries. Along this time, mechanical harvesting came into this thing too, and so I was involved in that project, on quality issues with mechanically harvested fruit. But it was directed, and with that we did get money – enough, certainly, for laboratory supplies.

CP: And how long did that model continue? Was that for most of your career?

RW: Well, let's see. Other things happened too, where commodity commissions started giving research support. So there I was able to get funding through the Cherry Commission, Blackberry Commission, Blueberry Commission. A lot of this too was collaborative with Horticulture and USDA, and we were able to get funding through commission research. And then, beyond that, when the Small Fruits Research Laboratory, that venture went forth – Bud Weiser was a big player in getting that to campus – that was a big help, because I was able to then apply for grants and get grants from the Northwest Center for Small Fruit, which is a tri-state – Washington, Oregon, Idaho – federally funded project. So I got a number of those projects. I should remember when those things started, but it was probably in the '80s when that funding started.

[1:05:47]

CP: You referenced a colleague in New Zealand, you went on your first Fulbright to New Zealand in '72-'73, and went back many times after that to New Zealand and Australia. I wonder if you could talk a bit about what sounds like a very rich connection to New Zealand and Australia for you?

RW: Alright. Well, again, David Heatherbell and I really hit it off immediately, he and his wife as well. So we just became very, very close friends. So before he left, because he was to go back to New Zealand and work there at DSIR, before he had left we had plans laid that, on my first sabbatical, I would come down and work in the lab where he was in New Zealand, which I did, '72 through '73. So I spent that year there and that was just a fantastic year, and it was during that year that I met my wife. So that's another reason why there have been continuing trips down to New Zealand, continued further sabbaticals.

So I had the sabbatical '72-'73, then after we were married, our next sabbatical – and my wife loves travel also, so she's very supportive in this – and she said, "rather than go back to New Zealand, I think it's appropriate," we'd only been married a year, "that we see something of the east coast." So I went to Cornell and was there for the second sabbatical, also with six weeks at General Foods in Tarrytown, New York. And then the third sabbatical, we did return to New Zealand; our daughters were five and seven at that time. And again, it was back to the same laboratory in Auckland, however, we were there for eight months, and then we did four months in Norway, which I've always wanted to go to and my wife also loves Norway. So we went to Norway.

Then, in '94, I had a mini-sabbatical – the deans were kind to me, they gave me "change of station" rather than sabbatical, for four months down at the University of Otago, where I was a fellow in working with a colleague, Laurie Melton. And, of course, in 2002, then I was back for sabbatical, and this time at Massey University, which is just north of Auckland and twenty minutes from a house that we now own; that was convenient. And I guess that was my last sabbatical; I don't know if I left any out or not.

CP: Well, you succeeded in fulfilling that travel ambition.

RW: Yeah, I did. And our research really opened that up too, because one of the areas that I got into – we were basically doing composition of fruits and vegetables. Yes, pigments and color always has been part of it, but pigments and phenolics, a lot of work on sugars and acids. And in the late '70s and early '80s, fruit juice adulteration was a very big issue, and I got into work on that, on testing juices for authenticity to see whether adulteration had occurred. You may be aware, there was a big scandal with Beech-Nut apple juice where Beech-Nut apple juice for babies was completely synthetic, with invert beet sugar and caramel coloring and apple flavoring. But I did a lot of work in that area and I was able to get support from a consortium of juice companies.

[1:10:25]

And this is something that I did that really helped our laboratory, and it started about 1980, '79-'80, that colleagues – David Heatherbell was now back on our faculty, myself, Darrell Beavers, Morris Montgomery – got a regional grant for economic development. And the project was fruit juice; all of us were working on some aspects of fruit juice – Beavers on processing, Morris Montgomery on enzymology, David Heatherbell on both quality issues and processing, and myself largely on quality issues, and certainly adulteration and color issues were the two main applications that I worked with.

We got this regional grant and part of that grant was an industry advisory committee. So we put an advisory committee together from technical people from fruit juice processing companies in Washington and Oregon. A three-year project and it was quite successful, and at the end of it, a number of them said, "we really want to see this continue," and they said, "specifically, we want to see you work on adulteration continue, and somehow we want to fund it." And so we came up with a program where we would have an advisory committee that advised on research projects priorities, and the individual companies would fund, on an annual basis, an amount of money. When we started, it was \$1,000 per company.

But it gave me something like \$8,000 or \$10,000, and I got some good advice there from a good colleague, Merlin Fischer, who's a Food Tech graduate just one year ahead of me, and in the same AGR fraternity, we're still good friends. Merlin, very successful and worked with Kerr Concentrates and so on, he advised me, "don't go too big on the money, because if you keep it low enough, the technical person will have it in their budget to approve and fund you. If you start asking for larger chunks, it's going to go to the CEO and the board that have to meet approval."

So we started low and, within a year or two, it was raised to like \$1,700 or \$1,800. But at one time I had twenty-five companies, so it was really enough to help fund my research assistant, and also it helped support different graduate students that I had, and really made good connections with companies, not just here in the Northwest, but with, well, Ocean Spray supported me forever. And I had companies in Argentina and other countries in the world that came on board and supported our research through that activity. And I would send them quarterly reports of what we were doing, and we would meet twice a year – once in January at Northwest Food Processors and then we would meet at IFTE which would be, typically, June or something like that, with the group. But that continued until I retired in 2004.

CP: And what were some of the outcomes of that program of research? We talk about adulteration of fruit juices, what does that actually mean?

RW: Well, I think one of my favorite stories is the work on cranberry with Minot Food Packers in New Jersey. We had this work on adulteration going on for some time and one day I got the call, and a subsequent visit, by John Morello. It's a family run business, and they are cold packers, a small company that basically didn't print their Morello label on it, they packed for Safeway and other companies that put their label on it. But they make cranberry juice cocktail, and basically by the same formula that Ocean Spray does, with basically twenty-five percent juice, and typically corn syrup and water.

[1:15:23]

John Morello comes into our lab and he has samples, and he says, "see this? This is our competitors. They're only a few miles down the street from us, and I can tell that this is not twenty-five percent cranberry juice. You swirl it around," he says, "you can see the difference in color, it's not the same. I can taste it, it's not the same. We also know from what they are selling this for, they could not be making money, because we sell twenty-five percent cranberry juice and we know they're no more efficient, if as efficient, as we are. They're cheating, we know they're cheating, but we don't have evidence, chemical evidence. Can you help us out?"

And so, "sure." And so they funded us and supported Victor Hong, a graduate student in the master's program. But first of all, doing analyses of authentic cranberries, making our cranberry juice and measure the pigments, the sugars, the non-volatile acid profiles, going through all of that. And then, a second part of the study, they worked with a very sharp in Washington, D.C., and they sent us coded samples and we were to analyze them and give our opinion on whether they are authentic or not. Which we did. All the samples were coded and we suspected that some of them would be their samples and some of them would be probably Ocean Spray – Ocean Spray was not suspect – but then there would be, obviously, competitor samples, which an independent attorney had sampled from different grocery stores and outlets there in the Northeast. Well, by far, the majority we had proof were not authentic. And I remember being on the phone with the attorney, Jim Tupin, and we went through.

And so, with that, they went to court, and they filed in district court against two different processors. And before the trial – so, I wasn't able to go back and be a witness for the trial – before the trial, the firms admitted that they were cheating and they agreed to pay back money, they agreed to have a continuing sampling of their products. And we published two different papers on this and presented the data at AOAC, but yes, it was successful for more than one reason. They got reimbursed, and I don't know the amount of money, but it was in the millions. And Ocean Spray was relieved, because if it had hit the press, "adulterated cranberry juice," cranberry juice, in 99% of the public, is Ocean Spray. And so they don't look at these other products. And Ocean Spray was supporting our research and they were relieved because it just never hit the press. While we presented it, papers were published, it never did get into the media, so it was never on television. It got into *Food Chemical News*, but no one picked it up in the popular press.

[1:20:20]

And as a sidebar on that...who was the attorney that defended Clinton?

CP: I don't remember. Kenneth Starr was on the other side, I think.

RW: Yeah. The one who defended it, he's quite a man, he was in a wheelchair because he had contracted some disease when he was in Africa, I think as a grad student or something like that. I'll think of his name eventually, but he's a very prominent attorney. Tupin was on vacation one day, and this is the person that I dealt with on the cranberry juice project. So they went with a very prominent firm in going after that problem.

CP: It's really fascinating to hear you talk about how your lab was basically a check on an entire industry.

RW: Well, there are a number of analytical – we were one of the few analytical academic labs working in this area. There are private laboratories – Krueger Laboratories and others – the fruit juice adulteration was such a big deal than Alan Brause had this company that, at one time – I first got to know Alan when he came to the meeting symposium in 1980 that we put on up in Portland. When he came at that time, he was working with Kroger and Company as a quality assurance director. And I got to know him and he just became a crusader against adulteration, and eventually he resigned from Kroger and started his own analytical laboratory, doing the types of things we were doing – analyses to test for adulteration. So there are private analytical labs doing that, but not many in the academic area that was doing that.

But it was really a fun area to be working. It's true, people could be supporting your research and you never knew if the fox was in that mix of people or not, there's no guarantee. And what the cheaters really want to know is the limit of the sensitivity of the methods. So they want to be at the borderline of when you can or cannot detect adulteration, so they want to be up on top of what's going on analytically. And there are a lot of symposia – and we really had quite a, almost fraternity, of people who were working on this area – the American Chemical Society, they sponsored a number of symposia, books were published. And also internationally, so I was able to get trips to Europe and so on, for meetings reporting on our work. And once again, a network of people that are working on various analytical methods to be able to detect this fraud. It was a great experience; many long-term friends from people working in this area. And it's a good feeling, because you really felt you were doing some good.

The problem will never go away, it will always be there, because people are greedy. Today, really the big issue – and if I were still working in a laboratory, we would probably be more involved in it – but nutraceuticals and all the dietary supplements, the amount of dietary supplements that are fraudulent is amazing. I try and keep up with some of this, and you see papers where they've analyzed a whole series of commercial acai samples or dietary supplements and so on, and they find that a lot of them are bogus and don't begin to have the 100% ingredients that they say that's in there. But there's money to be made; you've got something in short supply with a high economic value, someone's going to jump in.

[1:25:10]

CP: I wonder what it must be like for you to go to the store and start reading labels?

RW: [laughs] Yeah, I do. I also have confidence in brands. And also, I get Alan Brause who, unfortunately he's not living anymore, but he used to say, "when the price is too good to be true, it usually isn't." And that's a giveaway, often. But a company like Ocean Spray, TreeTop, they're not going to do the risk, they're not going to take that risk. It's other pliers, particularly when you get into the private label where people are told, "you've got to meet the formulation for

pomegranate juice that POM Wonderful has, and this is the price we're willing to pay you for it." Well, they've set the barrier right there and you've got to make some profit, and so you cheat a little bit.

CP: You referenced the paper that you wrote on phytochemical composition and antioxidant properties of fruits and vegetables, and I gather that was a pretty important or series of publications.

RW: This is the one by senior author, is this the one on *Ribes*?

CP: I'm not sure, I don't have the specific reference, I just have the topic and date, 2002.

RW: Yeah, that was the Citation Classic. Richard...I want to say Moyer, Richard Moyer. Yeah, Richard Moyer, senior author. He did a post-doc, he actually did his Ph.D. here in the Toxicology or Biochemistry department, and he had a teaching position in a small private school back in Tennessee. He came here for a year's sabbatical, and he had this real interest both in plants and health benefits, and so he worked in our laboratory and also with Chad Finn at USDA and Kim at the USDA Repository Center, and it was a phenomenal piece of work. And *Ribes*, *Vaccinium*...what were the three...but an extensive collection of all these materials. And with the Linus Pauling Institute, they did the antioxidant properties, and in our lab, he did the anthocyanin profiles, the phenolic profiles, of these materials. So it's one of the largest studies and it was very timely when it came out, and it's been widely cited.

CP: But it sounds like were kind of an adjunct to this? Or how closely involved were you?

RW: Oh, well, he worked in our laboratory. And so all of the HPLC work and the laboratory work was all done in our laboratory, except for the antioxidant properties which was done at Linus Pauling, but all the sample preps were done at our laboratory and then taken over to the Linus Pauling Institute for those specific analyses. And of course, there was a lot of field work involved, during the growing season, of collecting all of these many, many samples. And then doing the appropriate triplicate analyses and sampling, and so it was all done very appropriately.

CP: Well, before we move on, I want to make sure – are there any important themes of your research that we have not touched on thus far?

RW: I think we touched on natural colorants and we've touched on fruit juice adulteration and antioxidant properties and health benefits, because that, during the last ten years, was what we really worked on. But those three things. And, of course, it all really started with color quality, so I'll say, it still is important, these different quality factors. But certainly, with health benefits, the research finally became respectable [laughs] amongst the public. And adulteration, certainly that really caught industry's attention in particular. But also the public, when these scandals hit, people were obviously very upset; consumer awareness is very, very important.

[1:30:33]

Natural colorants, that's a fun area and I still have – well, I turned down an invitation to give a talk on that just this June, because I'm going on a bike ride instead – but there I had a very nice working relationship with – and this has happened since retirement – Cathy Culver at PepsiCo. She called me in about 2004, maybe late 2003, before I retired. She was responsible for all the colorants in PepsiCo and Frito-Lay, so Pepsi-Cola, caramel coloring, Gatorade, yellow, blue, red and all of this stuff. And she was asked to organize the symposium on natural colorants. And so we really hit it off and we organized a three-day symposium, I think thirty-six speakers. And here I have a lot of resources, I've been teaching colored pigments analysis for over a forty-year period, and certainly was aware of people not just working on anthocyanins, but all of these different colorants. And so we worked out a symposium, and the symposium was successful and held, and published as a book. So we have a thirty-five-chapter book on that, and myself and a number of my graduate students are among those with chapters in that book. But I really feel that that was a noteworthy contribution.

And then Cathy and I were asked to write a review paper on natural colorants, and we agree on so many things, "ok, we're going to do this and we're not going to take a chemist's perspective, we're going to take the product developer's perspective. Because this is what happens in product development labs." Boom. "You've got to get natural colorants to replace this red in whatever the product is." And so we said, "we'll do it by color," and so we started with reds, yellows, greens, blues, white and black. And what can you do if you've got the charge to eliminate synthetic colorants and use natural colorants? So that, we've got a lot of requests for that paper. It's been, I think, very well received.

CP: I want to ask you a bit about teaching. So you came to Oregon State, the second time around, and you hadn't done any teaching at all, it sounds like. But you became a very good teacher, an award-winning teacher, and I'm interested in how you evolved.

RW: Well, that's what I wanted to do and one reason why I really wanted to go into academia, because I wanted to teach, and the lecturing I had done, I really enjoyed. And keep in mind, when I first came here, I started in Science Education, that is what I wanted to do, with a goal of teaching high school.

So then, when I got the tenure track offer, part of that was, as Schultz said, "we need a graduate course in carbohydrates and we haven't had someone to teach that. We need a graduate course in colors, pigments, and color measurement," and that hadn't been taught, and so we need that. And so I was assigned those two courses in alternate years, and then also assigned food analysis – the first time I taught food analysis was '70 – and that was, of course, to be taught on an annual basis. And that was a five-credit analytical course of two three-hour laboratories. And so I really got involved in that course, in particular, and the others.

[1:36:09]

So throughout my whole career I did teach the colors and carbohydrates. Finally, it was only published in 2005, I published *Food Carbohydrate Chemistry*, based on the outlines of lectures that I had been giving for forty years. Basically, through the years of teaching that subject, I was invited, I was asked, to develop such a book. But I did it through IFT Press and John Wiley & Company. But that was finally published.

But I did the food analysis and then I was on my sabbatical in '72-'73. When I came back, Cliff Samuels had just died, and so then they asked me to take over the food chemistry course. So then I was teaching the food chemistry course, which had two terms at that time – two four-credit courses. So I'd always had a pretty heavy teaching load, plus I was advising – was quickly appointed advisor for the Honors Program, and so we had the honors students, and always had advising. And then chairing the undergraduate committee for many, many years. So a very heavy involvement.

CP: What was "Functional Foods?" I have that listed as a class that was popular.

RW: Yeah, I was asked to do that. "Functional Foods," this is part of the health benefits thing. So foods that provide more than the basic carbohydrates, proteins, and fats. And so functional foods will be identified as, I guess pomegranate juice would be a functional food. As you see now, so many of the foods that are fortified with extracts or promote their antioxidant properties and so on, these would be functional foods. Foods that can help reduce the risks of cancer, coronary, heart disease, and diabetes. So they're providing a value beyond basic carbohydrates, proteins and lipids.

CP: I have a couple of concluding questions for you – the first one is quite broad and you can respond to it however you would like – but you've been associated with Food Science and Technology at OSU for sixty-some years, obviously you've seen a fair amount of change, I'm quite sure. If you could reflect on how Food Science has evolved as a department at OSU and where it's at right now?

RW: Well, certainly a lot of positive things, because following retirement, I still have an office in Wiegand, although it's now a desk. I have a desk rather than an office, and it works fine. I have what used to be a receptionist's desk, outside Yanyun Zhao and Mark Daeschel's office. And before that, I shared an office with Jan Smith, and then I had an office sharing with Tom Shellhammer. And so I like the interaction with the faculty and the students, and yes, what they're doing today is far superior to when I was an undergraduate or through my years of teaching. There's been many, many positive developments.

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Of course, the enrollment is an enormous success. There's now over 200 undergraduates, whereas we were struggling in '80s to early '90s with maybe twenty-five or thirty or something like that, and were close to being shut down as a department for low enrollment. So enrollment is one thing, but why has the enrollment picked up? Well, yes, it's Fermentation Science; that's the big success. But the success of Fermentation Science is also because it's exceptionally good faculty – Tom Shellhammer and the brewing program, and unfortunately we lost Jim Kennedy, who was in the wine program. Just excellent, and people like Tom and Jim, they attract students.

So I'd say it's positive. I think the quality of the faculty just continues to go up with Affirmative Action, and the desirability of academic positions. You have a tenure track faculty position open, you're going to get a lot of applications, and these people are very, very good. So yeah, Oregon State and Corvallis is an attractive place to come also, which is a good thing, a deserving thing.

CP: And taking it one step higher up, I suppose, you've been associated with OSU for this same amount of time and things have changed quite a lot, university-wide. Where do you see OSU as being positioned right now as it looks toward its 150th birthday in 2018?

RW: What's going to happen in the future?

CP: Well, things have changed dramatically just within the last couple of years...

RW: OK, just within the campus. Well, I think Ed Ray, the building program is phenomenal. I think the infrastructure that we have on campus is really something to be proud of. And I don't think it's by accident – someone, probably many people, have been really involved in just the beauty and layout of the campus, and that's a very attractive feature, everything from Kearney Hall to Agriculture Hall to the Education Hall, what they've done with these old buildings, let alone the new ones. Whoever had the idea for making the minority centers – African American student centers, the East-West, the Hispanic Centers – to make them prominent agricultural sites on campus, I think whoever came up with that idea deserves some credit. Just a lot of, I think, very, very positive things.

CP: So you're optimistic then, for OSU's future?

RW: Yeah, I'm very optimistic. It's a beautiful place to walk around and there's just a lot of talent on this campus. And I don't know if that's unique – I think there's a lot of talent on a lot of university campuses – and what I used to tell colleagues, relatives about working in the university, I says, "well, you really get to work with a lot of talented people. It doesn't mean that it's easy." [laughs] Particularly when I was acting department head. Yeah, you've got some talented people, but they're not necessarily easy to work with. They have their own ideas and the autonomy is one of the reason it attracts people to faculty positions.

CP: Well, this has been fun Ron, thank you very much. I appreciate you spending this time and sharing your memories with us.

RW: OK.

[1:44:51]