Following is a transcript of a conversation with Cyrus Bacchi, Stuart L. Marcus and Nigel Yarlett on May 21, 2014. Interview by Donald Shankweiler and Carol Fowler.

Some things not on the tape:
There are papers of Seymour Hutner at UMass Amherst, archivist: Michael Dolan, Department of Geological Sciences, UMass, Amherst 01003

Helpful books: Ann Sjoerdsma: *Starting with serotonin*
Sidhartha Mukherjee *The emperor of all maladies: A biography of cancer*

SM: And there's one anecdote that Seymour starts but never finishes about when I came to the Lab when I was 14 years old, and he asked Herman… and I asked Herman…I asked Seymour because I was going to reproduce Zinder and Lederberg's U tube experiment but with Fisher culture cells which is to show that there were cancer viruses. So I was going to do cancer cells. They used it to show that there was…genetic material could be passed by bacteriophage back and forth through a U tube with a filter in the middle. And I wanted to do that with Fisher culture cells at the age of 14. And Seymour told me why I *couldn't* do it. In his opinion why I couldn't do it. And he…
CAF: Was he right?
SM: I never found out. But anyway...At the time. So I was kind of miffed, and so I said, well what is it that you do here anyway? Because he was lounging…It was at 305 East 43rd Street in 1961. And he was lounging in his beach chair at the time, sitting at this wooden desk, which was overflowing with correspondence and papers and notebooks. And I said what is it that you do here? And Herman Baker who I didn't notice was over at the end of the room inoculating some tubes with a pipette and a Bunsen burner, and he (Seymour) said: 'That's a good question. Herman, what do we do here?' And Herman said: 'We're a soup kitchen for bugs.' And that's the actual quote from Herman. And I went to Herman's funeral not long ago.
CAF: What's his last name?
SM, CB: Herman Baker
CB: He basically worked with Seymour for I don't know since…
SM: Probably longer than anybody
CB: Yeah. He started working in the mid 50s, and he was at College of Medicine, New Jersey College of Medicine, Rutgers, OK?
SM: And he was a Full Professor of Nutrition and Biochemistry [Dept. of Preventive Medicine and Community Health] at University College of Medicine
CB: But he was essentially Seymour's assistant for many, many years. He did…he published all of the vitamin assays that Seymour did. He published…
SM: We even did some work on patients treated with interleukin 2 in 1987 and published in *Cancer Research* to show that …because you know nutritional biochemists are always looking for reproduceable physiological stress, and giving a patient interleukin 2 threw them into, basically, shock, and it was a reproduceable

septic shock condition. So I said: Herman this is a great chance to look at what happens to the body under this kind of reproduceable stress, and it turned out to be really interesting. And vitamin C turned out to be the only nutrient on the face of..[…]…

CB: I'm going to copy all for this for you. But what I want to do is keep this.

SM: …from the body during treatment. And for about 2 weeks of the treatment. And it had never been seen before that it happened. It was being sequestered, most likely, in micro cells. But so Herman …and Seymour is a coauthor on the paper in *Cancer Research.* So it 's just another example of you know the Haskins Laboratories octopus as Seymour used to like to call it where the research extended into strange ways. From us high students.
CF: Well, I was just going to say…So you're one of the high school students that he served as mentor of.
SM: I am Actually, he called chickens, but really that wasn't the term he used. He used the term, junior bug lover. That was the term. And Cy and I were just talking that there is a huge collection of Haskins Laboratories Christmas cards that Seymour would send out. He would draw the cartoons, I think himself, didn't he?
NY: Yes, he did.
SM: He drew the cartoons himself. And he wrote a poem on … every year. And the poem was…I mean if you ever read Lewis Thomas' [*Lives of a Cell]* poetry...Lewis Thomas was a great poet and essayist. But Seymour was a superb poet, and his poems, however, usually required a PhD in biochemistry at least. At least one PhD or maybe two to figure them out.
DS: His remarks in this transcript I think require that.
CB: That's what we tried to do…
SM: He sometimes is disjointed and sometimes has only partial sentences. And he was that way in life too.
DS: With re-reading you get more.
SM: Yes, you do get more.
CB: Did you see that stuff about the atomic bomb in there? And chemical-biological warfare? If you read through that…Everytime I go through those transcripts, I get something more out of them. It's scary, it really is. They were…Caryl Haskins was assistant to Vannevar Bush who was a director of you know research during World War II, you know, for everything and Caryl…Caryl Haskins was his assistant. So they do things that a lot of people did not know.
DS: Frank Cooper was in that group too.
CB: Yes, absolutely.
DS: So I want to follow up on a question that Carol started to ask. At age 14 you met Seymour and how did he have tentacles that reached to all these schools.
SM: Well my involvement with Haskins came completely by accident. In 1957, as you know, Russia launched Sputnik. And that was… the United States reacted because it was the cold war by deciding it had a science gap. And it had to fill the science gap. So it immediately threw tons of money at high schools and colleges to set up science training programs for smart people or people who were interest in

science or to *get* people interested in science. And my teacher at the time said...you know, he knew I was interested in science, and he said well you know there is this NSF program. And I applied to several NSF programs, and I was put on the waiting list for Queens College…yes for a Queens College program. And then he said, well, I heard of this laboratory in Manhattan that takes high school students. He said, but I don't know very much about it. I just know it's on 43rd Street. And it's called Haskins Laboratories. And so I looked it up in the phone book. And I called Haskins Laboratories from the one telephone in the apartment. And Seymour definitely was the guy I talked to, because he had the high squeaky voice and nobody else did. And he said: Oh, come in. Saturday. We're all here Saturday. Come on in. And so I got in my little suit. And my father accompanied me. And I had my suit and my tie. We ended up before this big red door on 305 East 43rd St. And I said it's locked, what am I supposed to do. And there was a bell over there, so my father said: ring the bell. So I rang the bell. And I heard a window go up like two floors above me. And somebody stuck their head out and said: Step back! And I stepped back. And down came this little plastic bottle with a rubber stopper in it and it had the key. And I opened the door, and it's a huge door. And walked up this dark…There was a freight elevator, not working. of course, on Saturday. And I walked up this …He said: "Come up to the fourth floor" So I walked up these rickety stairs to the fourth floor. Where I walked through, as it's described there; you know the library was here and the desks were here. There was linoleum, which turned to a wooden floor. And these were rooms that looked very much like *these* rooms [at Haskins-Pace] at the time. And that's where I found him sitting in his beach chair when I was 14 years old.

And he said: Well, you could stay here and do some research if you want to. He said: You have to take off the jacket and tie though. And I said: What could I do.

So Herman [Baker] says; Well you could screw these bottle caps…these S tube caps on and then you could tell your mother you spent the entire day *screwing*. It's so Baker; it's Herman. But that was a pivotal moment in my entire life. *The* pivotal moment in my career. So the Haskins octopus as it were stems from people like me, Dan Petrylac. One guy who is not mentioned in there [Nye Oral History] is…the yeast…David Kaback, the yeast geneticist who is a very famous yeast geneticist actually. Seymour must not have liked him that much since he didn't mention him. He was a mama's boy we all knew that.

CB: But Davy Kaback was sort of like Stuart, in the sense that he came in later on.

SM: But he was very young when he started. He was very young. So I think that the Haskins octopus is simply that people…Seymour didn't… he had his world view which was completely opposite of most of the scientific world view at the time. So Haskins was a totally wonderful place to work and grow up. Because I grew up there. With Cy. When Cy was a graduate student and I was a college student. And Cy and I worked together when he was a graduate student on his thesis. So that was so exciting. But we basically spread around. And Seymour hoped that we would spread the gospel of protozoan models of disease and human states of metabolism. And few of us really understood even today everything.. .his vision. Because Seymour was the only man I knew to this day who could synthesize material from 20 different sources, 20 different fields of science at least.

CB: And put it all together

SM: And put it all together.
CB: I mean you can read from these tapes. If you heard them or read the transcripts of Seymour talking you can see him talking in there, because he changes…he shifts gears…he talks about certain things, and he pulls stuff together. Sometimes its confusing, but, you know, there's a trend to it. And that's what the interesting part of him was. He was a genius and somebody that you never, ever meet again.
SM: The term Renaissance man is used too often these days. But Seymour was truly the only man I know that I would even, you know, deign to call a Renaissance man. He was a man..He mapped with his brother the trails up in the Adirondacks. He had stories, poems published in the New Yorker magazine. He was a master writer and stylist and literary persona. He was the opposite of the withdrawn scientist. But he… the unfortunate thing is that the only reason that Seymour did not get elected to the National Academy of Sciences. I can tell you. I *know*. And the reason I know is because I interviewed with the great geneticist Barbara McClintock. Very famous. Got the Nobel Prize for extra-chrom..extra-nuclear [bioinheritance?]. And I was interviewing for a post doc at Cold Springs Harbor at the time. That's where she grew her corn in her last days and did everything. And I was interviewing with somebody else, but she was my contact through my sponsors at […] university. And I said to Barbara, do you know, or Dr. McClintock, do you know Seymour Hutner, because she had mentioned Seymour. I said: Do you know Seymour Hutner. She said: Yes, I know Seymour for many, many years. He mentions her actually on one of these tapes.
CF: Yes, he does; he was her student.
SM: I said: Can I ask you a question about him? She said: Yes, sure you can. I said: Do you think he will ever get elected to the National Academy of Sciences? And she said; Never. And I said: Why? And she said: He's pissed too many people off.
And you can tell from the tone in the transcripts that he delighted in puncturing the balloons of these Geheimrat professor types who attempt to run the world.
DS: I would..when I was at 43rd Street, you know, I had nothing to do with that group. But I would meet Seymour on the elevator and he'd always have something to say on the way up. And that was a slow it didn't have to go many floors, but it was very slow.
SM: He would come over to you and say: I just destroyed this guy in a review. You want to see? And I am sure he did it to you guys all the time. And the problem with that is that Seymour was the only one who could write a review of an article like that. There was nobody in the entire academic world who could use the kind of references and grammar as Seymour did.
CB: I recall he said: This guy is a salami slicer. And it actually went out like that: He writes like he's a salami slicer.
14:50
SM: So Seymour really did not get the credit…Those of us who can judge him objectively I think at this point in time…Besides the tremendous polymath…and he he was a polymath who touched everything from, you know, nuclear physics and radiation to engineering to biochemistry and *abstruse* biochemistry and you know he set up the first assays for the vitamin. There were no machines…

CB: They developed, probably between Herman and he *and* Luigi Provosoli, because Luigi brought the original Euglena. And that's the basis for all these assays for B12, folic acid, niacin, panthothenic acid. All these different, you know, different organisms, they dissected the medium until a point where there was no B12 in it for example; then they would get it to a point, the medium, where it was defined that they knew everything in it and it would respond… the only thing that it was missing was vitamin B12 and then you would get like a linear relationship in terms of growth to amount of vitamin B12. It was beautiful.
SM: And so it was extremely cheap, easy to use. I mean one of the things, you know, that I added to it was that... Seymour was always looking for simple techniques. And the fact is that Seymour had said in my presence and many times that the way he defined the simplicity of a technique was that if he couldn't teach it to a high school student in an afternoon, it wasn't worth developing. And I try to think of all the things that they do nowadays that you can teach to a high school student in an afternoon. You probably can because you simply inject them into a machine and the machine does all the work. But he was …So again, that's the Haskins octopus. The Haskins octopus was people who kind of were raised by Haskins and went forth into the world. The problem was that we couldn't carry Seymour's message to the world, because it was way too complicated for us. When I went to medical school after being at Sloan Kettering for a number of years, *while* being at Sloan Kettering for a number of years, he was absolutely thrilled, because: Aha! Now you'll infiltrate the medical world and convert them. I said: Yeah. But the philosophy of you know science overall and equality for all. I mean, do you know what it was like to be a high school student and to sit for tea in a table very much like the table…like this table or the tables in that room and sit down and have tea with somebody like E. Lester Smith, who you learned was a Nobel Prize winner and other people, I think Jacques Monod visited one day and you know various other Nobel Prize winners who came to visit Seymour. And we all sat around our little table and had our tea or our bitter lemon or egg creams or whatever.
CB: Yeah. Four o'clock everything would stop. Basically. And Seymour…we would have high tea with Seymour.
SM: So Seymour taught what science is. I mean..
CF: But his manner with students and with his colleagues at Haskins seems very different from his destruction of people that…
SM: Seymour was always critical. Unless you were blond, female, and skinny. And I remember him walking over… Whether it was Cathy [Podgorney] or someone like that… Cathy…And he walked over to her one day and I'm slaving over an experiment. It's like 100 degrees in here. And he goes: Hey Cathy, you want to be an author on my next paper? I'm going…You never made that offer to me, Seymour. He said: You're not blond and skinny, and female. Sorry. No he made no bones about his sexism. It was a very positive form of sexism for people like Cathy and you know Kate. But they did their own stuff too, but..
DS: I used to see a lot of nuns going up the elevator to Seymour's lab.
CB: Oh yeah. That's the Fordham crew.
SM: That's the Fordham connection. That's the Fordham connection.

CB: I was in the first class of…Seymour's first class at Fordham. He became an adjunct because he knew John McLaughlin, who was in the lab, and you know an oceanographer, an algophysiologist. And so when he became Chairman at Fordham, Biology, Seymour was one of his top picks as an adjunct. And I wanted to…He had a course called Advanced Microbial Physiology. And that's really what I wanted to learn because I had Micro in undergraduate and I wanted to build on that. So I saw this course and everybody said: Oh, Don't take it; he's going to be really bad; he's going to be tough. So I said: Well, I'd still like to take it. So I did. And we started out with 43 people, and we wound up with 15 at the end of the semester. You know, and Seymour would say, you know: Sure, bring…there's a test next week. Bring all the textbooks you want. So people came in with their little red wagons full of…and all of this. But it wasn't going to do them any good, because you had to know…
SM: You had to think.
CB: You had to synthesize what he had been going over.
DS: That's wonderful.
CB: And that's the way he worked. And that's why he *was* obtuse and all of that. But he made you learn.
SM: But that was a graduate level course the way he taught it.
CB: Yes, it was, yeah. Well all these people quit, because…Nearly 2/3 of the class quit. And one of the survivors was one of the… Sister Sally, she was a Dominican nun, and she got her doctorate and probably left the order after that. We were notable in that we had like uh, we had Sean Fanelli who became what? President of Nassau Community College. And he just retired a year or two ago, but he was a year behind me at Fordham. And Father McCarthy who was at Fordham, but he passed away.
SM: Did he get …Wasn't he a professor at Fordham at the time, or did he get his PhD?
CB: He got his PhD. But he had hypercholesterolemia and at the time they couldn't do anything. Like he died at about 48 of a heart attack. You know, it was really bad. He was a great guy.
SM: There was this great Jesuit connection with Haskins and as a nice Jewish boy I used to be intimidated by the sight of the nuns walking around. Because this was pre-Vatican II, I think.
CF: But why would they be taking these courses? Were they going to teach science?
CB: Well, yeah. They were going to get their doctorates.
DS: That was one of the main things nuns did, I guess, was teach in NY.
SM: Especially at Fordham.
CB: We had a lot of clerical people in it.
SM: Boy could they drink. Oh my god.
DS: I remember after, soon after…maybe the first time I met Seymour soon after I came to Haskins Labs, I asked him if he taught and he said he did at Fordham. Then he said something that surprised me. He says; I'm a thorn in their flesh. I still remember him saying that.
SM: And he enjoyed being a thorn in their flesh. He never rolled over for anybody. And if you pushed him, he became much more vocal and nasty.
23:22
DS: But he could talk Bible with the rest of them.

CB: Oh absolutely.
SM: Seymour had very close to an eidetic memory. And he could remember chapter and verse as good as any priest could. And he could just come right back at anybody with anything. And it's one of the reasons it was so intimidating to be with him. But you have to understand. He made us all feel that it was---even as a high school student—there was this wonderful feeling of…you counted. Even if all you were doing was screwing on test tubes. Because you had tea at four o'clock with everybody else. You were allowed to listen to and join in the conversation. You know…
CB: He took you on with no transcripts, no recommendations.
SM: Transcript! I was a fourteen year old high school freshman. What kind of transcript could I possibly have.
CB: Well, no.
SM: I published my first paper when I was 18 years old from Haskins Laboratories.
CB: Yeah.
SM: So in 1964, I worked with this guy, Art Zahalsky. Whose name is mentioned and misspelled as Zahlsky in the [Nye] transcript.
DS: Art was being paged all the time.
SM: Yes. And Art… It was the simplest experiment in the world. I think we were looking at nitro-quinoline N-oxide and mixing it with bacteria. And the bacteria would take it up. And we'd put it through a Miliport filter and see how much of the nitro-quinoline N-oxide was taken up. And then try to compete with various amino acids and see what pathway was being used to do it. And we published a note in *Nature*. It was Zahalsky and Marcus, 1964. So you had an *incredible* opportunity to learn science. And I didn't think any other place else was different. You know, when I was fortunate enough to go to college, I went to college in Brooklyn College where I met Mel Belsky, who is also mentioned in the transcript, and Professor Selsky. So it was Selsky and Belsky. And Bensky, Barbara Bensky was working there. And Seymour always wanted to publish a paper that was Selsky, Belsky, Bensky and Zahalsky. Never really got to it. But that was the Seymour connection to Brooklyn College. To Mel Belsky who had worked with Seymour back in the 40s I think as well. And 50s.
CB: I didn't get a bio for him. What I tried to do in here is put little bios of the people that were, you know like a line or two, births, and all of that. The one thing though is that, talking about Seymour and his knowledge of the Bible. When his first wife, Reina, died…unfortunately she was terminally ill with breast cancer and she knew as a physicist that they were going to irradiate her. So she took cyanide and that was it. She died, I think in '53 or '54 somewhere in there. But it's here. And he then met Margarita who was…, Margarita Silva who was a professor of dermatology at Columbia Medical School, and she was from a Puerto Rican family, Catholic. So Seymour converted to Catholicism in order to…Yes!
SM: I never knew that. I never knew that. For some reason, he never talked about it.
CB: Yeah he did. He… Yeah.
SM: I would have loved to have seen that…
CB: Well. Margarita told me that.

SM: Seymour reciting the catechism. That would have been great. God, I wish I had been a fly on the wall.
CB: You didn't know that!
SM: No, oh god.
CB: That was a curve ball. He met Margarita and she was his match. She wouldn't take anything from him, you know, any of his guff, and she'd give it right back to him.
DS: She is dead now too?
CB: Oh yeah.
SM: But they did love each other.
CB: Oh yeah. But they were absolutely, you know, meant for each other. They were…
DS: We started this project too late. It would be so nice to interview Mr. Haskins and some of the other people.
CB: Oh yeah.
SM: Well, I see that you have Frank Cooper and who's the guy…
CB: Caryl …Caryl Haskins and
SM: Yeah…who's the guy who was the accountant?
CF: Ray Huey?
SM: Ray Huey, yeah. I thought he made some interesting points in his thing. But who truly.. .you know. I think if you got to interview David Kaback. Don't you think?
CF: How do you spell Kaback?
CB: K-a-b-a-c-k
SM: K-a-b-a-c-k. I think I have his number here. Because I met him at Herman [Baker]'s funeral.
CB: Oh right.
SM: He's practically bald which is a great consolation to me.
Here we go. He's at Rutger's New Jersey Medical School. He is a professor there, a full professor and he's a yeast geneticist. So his cell phone is 917-561-1050.
And his email is kaback@rutgers.edu
CF: Great, thank you.
SM: And the reason I say that is because he really…he knew Seymour pretty well also, and he was here after me, but he was younger at that time.
CB: But Davy helped me. You know, he was growing Crithidia.
SM: There you go.
CB: He used to grow 50 liters of Crithidia at one time. You know, I was isolating mitochondria. So we would come in at 5 in the morning and spin down all of this media getting these organisms and wind up with 30 or 40 grams of Crithidia.
SM: That was great having slave labor.
CB: It mean, I'm telling you, it was fantastic. It took two of us and two machines to do this; we didn't have the continuous… Bert set that up, the continuous flow.
30:30
DS: I need to ask a sort of orienting question about the science. I gather from the transcript, some of Seymour's remarks, that when he was a young man that microbiology was transformed from a taxonomic science to a more analytic biochemical kind of thing.
CB: Yeah, physiological..mmhmm

DS: And he must have played a pretty big role in this transformation. Is that, would that be a correct inference?
CB: Well he did it for, well not so much for, well bacteria, but really for the protozoa. Because protozoology then was a descriptive field.. It was all taxonomy.
DS: Right.. That's what he said.
CB: And then when he founded, or one of the founders of the Society of Protozoologists, and he made it a biochemical and a physiological approach. Yeah. He broke it out of the mold of simply descriptive taxonomy.
SM: That's a good way of putting it. But Seymour… at the time, you know, Seymour's PhD mentor was [James B.] Sumner who was the first person to crystallize an enzyme, got the Nobel Prize for it.
DS: OK.
SM: Urease
DS: Urease!
SM: And Sumner used to…Seymour used to say that Sumner would complain because people would steal his urease to tip hunting arrows with. Because it was poisonous if it got into the bloodstream.
DS: What was Sumner's first name?
CB: J. B.
SM: J. B. Sumner…Yeah.
CB: James B., I think, James B? I think.
DS: The first to crystallize…
CB, SM: Urease
SM: A protein, an enzyme, urease
DS: The first to discover that an enzyme is…enzymes are proteins?
SM: No, the first one to actually purify it into a crystalline form. He was the first person to purify an enzyme into a crystalline form. And that was a truly biochemical revolution. That started the entire, you know… people could actually do biochemistry. They really…Before then, they were simply doing metabolism, biometabolism. And you know he mentions Otto Warburg in there who was one of the Geheimrat type Professors. Everyone was using Warburg manometers to study metabolism. And Seymour…sorry, and Sumner created the revolution that led to the actual study of how metabolism works and how you can alter it and how you can study it. But Seymour's great contribution was…I mean, you know, and unfortunately I think his personality was what kept it from getting more accepted into the world. He never sought publicity. He expected the world would come to him. Because he was so brilliant. He would tell you how brilliant he was. When I was 14 I walked in; he said: "Do you want to see how famous I am"? I said: "Sure." What did I know? I was 14 years old. He shows me a letter. "This is from a Nobel Prize winner." You know, terrific! If you have a need to show a 14 year old how famous you are…OK. But at the same time, his attitude toward the world is, you know: I'm brilliant; I'm revolutionary; I can do all this stuff. You know it was hard to get grants. Any grants that came to Haskins were purely on merit, because there was no political favors being done! If anybody could criticize the crap out of them, they certainly would.

CB: In one story that he tells about Sumner was that Sumner had one arm. It was a hunting accident. I don't know which one, but he would do his crystallization of urease and precipitation with ammonium sulfate, he would do it single handed with one hand. He would do all this stuff. So somebody complained that they couldn't repeat, you know, one of the parts of the experiment. Do you remember this?
SM: No I don't remember it.
CB: OK! So the deal was that Sumner…you know, it wasn't like: you add this and the ammonium sulfate at the same time. No. He had to add it, then stir it, then, you know, put the beaker under his arm…stump or whatever and then come back. So the time it took for him to add this ammonium sulfate and swirl it was critical to the way that the enzyme precipitated. So then somebody, I forget who it was, but they said that they had to watch it and then they understood because it took him, I don't know, 10 or 15 seconds or whatever the time interval was. You know it wasn't added all at once. It was added gradually; and it happened over time and so forth and so on.
CB: In biochemistry unfortunately… that's why perhaps one of the greatest contributions to biochemistry was the volume series methods in enzymology, because methods in enzymology really captured things like that…In other words, how to… It was a recipe… Basically, it was a series of recipes and techniques of how to do things.
CB: It was a cookbook.
SM: It was a cookbook but a very important cookbook that all the biochemists needed to do stuff. I mean biochemistry…You know, an organic chemist would never recognize what a biochemist did because they…we were working with big…with huge molecules and we didn't have retorts and mass spectrometers and things like that. So..S.eymour's revolution was two things. Number one the use of ….the development of what are called microbial assays. Microbiological assays. That was all Seymour's. Now, why isn't that important now? Because now we use machines for all that stuff.
CB: In the 40s, you didn't have any of that.
SM: In the 40's, you didn't…And you didn't need it.
37:09
You could use these…find these organisms that were absolutely…like Euglena that were so dependent on vitamin B12 that you could use them to measure the level in the blood. And they were used in hospitals for that. And Herman had the whole… University of Medicine and Dentistry for a while was doing assays with organisms instead of expensive machines because they were cheap. But they did take a little longer than some of the new machinery. So by the time the new machinery showed up, everybody shifted over into, you know, automated chemical analysis of these things.
DS: So now, can you just go back a little bit and characterize the difference between then and now for these assays?
SM: Now the assays are all performed by machines.
DS: OK I got that, but what did *he* do.
SM: What did he do? He found the organisms that were not bacteria; they were other organisms; they were protozoa. And that was uniquely….Seymour was a

protozoologist. He was probably the first modern biochemical protozoologist. Wouldn't you say? He started that whole…
CB: Well, he transformed the field…you know…
SM: But he started that discipline of looking at the biochemistry of protozoa, identifying the unique aspects…Seymour considered that you could understand…In his own way, Seymour was reductionist. Seymour believed you could understand mammalian cells by finding the right protozoan system and studying it easily.
CB: Yeah.
SM: And Seymour developed methods that revolutionized the concept of biochemistry. Instead of having to make up culture mediums from…
CB: Cell cultures
SM: …from every time you did a cell culture, Seymour invented something called a dry mix. It was his invention, wasn't it?
CB: Yeah.
SM: A dry mix was where you literally calculate, you know, for a thousand liters of medium to grow a culture, and you take all the…you weigh out all the crystals of this stuff, of all the components, there could be 20, there could be 40, there could be 50 components in this thing. And you put them in---this was good—you have any of those things with the balls?
CB: Yeah.
SM: Oh OK .You put all these powders with all these different shaped crystals and everything in this… ball mill. That's what it is. It's a ball mill. It's a porcelain…
CB: I'll get one and I'll show it to you.
SM: It was…it's a porcelain crock that you can…you can fasten the top and you put these balls, porcelain balls, they're heavy balls, and you grind it, you roll it on a roller for days sometimes. For days. And what you are left with is a very fine powder that he called a dry mix. And what the dry mix really was was instant culture medium. And he created the whole concept.
CB: OK here we go [bringing in a ball mill: box containing porcelain balls]
SM: Yeah! Here we are. This is living history here. This was Seymour's…
CB: See you put all of your dry powders in here. Then you get some of these balls. It pretty much didn't matter. Except usually you used a couple big ones. He made a, you know, a different, you know, group. And then, this isn't the right one for this, but you get the idea. You had something that sealed it, alright, and then you had a roller machine.
40:42
Where this thing rolled, and the balls went around and it was, you know...There would be two rollers and a belt drive, and, you know, it would just roll and it would micronize all of the materials you had in there.
DS: So the balls are just some inert material.
CB: Yeah right.
CF: The idea was just to crush up the crystals.
NY: And to mix it up
SM: And, you know, and it was truly revolutionary. You couldn't do it with tissue culture medium, because too much of the stuff for tissue culture and for animal cells is gooky and you can't make a perfectly dry powder. But you could do that with this.

The other thing, I think, that Seymour invented that was his…was volatile preservative.
CB: Yeah.
CF: What?
SM, CB: volatile preservative
CB: What this was was a mixture of organic solvents that were not mixable with water, but [object-falling sound] gave off the fumes. I don't know how that's going to sound on the tape. But, yeah, it's not the right one. [trying to fit a top on a bottle that did not fit it.]
SM: That's OK.
CB: Yeah. But you could keep your solutions, basically, at room temperature, and they wouldn't get grossly contaminated.
SM: The brilliance of the volatile preservative concept…The absolute sheer brilliance of it was that it wouldn't mix with the solution, and it would evaporate over time.
CB: And autoclaving. When you autoclaved the media, you know, made up, you know, from..and you mixed various…and you added your solutions in. You know, once you autoclaved it, it would be…it was volatile. So it would be driven off.
SM: So you didn't have to have special sterile rooms filled with media. You didn't have to spend…
CB: That was a big deal. But the thing that he did was he dissected the needs of the individual organism and compounded the media so that it would respond to a single vitamin. B12 for Euglena and lactobacillus was folic acid, right? And so this was the value of his defined media.
SM: Yeah. You could… See…you could package your dry mix, sell it to a hospital along with the strain of organism and your volatile preservative and the hospital would have a nice ready supply of media and quickly be able to make up the flasks it needed for tube assays of blood.
CB: So what you would do…if you wanted…you've got blood from a person, you know, spun out the red cells, took out the plasma, precipitated the protein out of it. And then you could add this back into your media which was devoid of B12 and the Euglena would grow proportionally to the amount of B12 in the serum and they could calculate the, you know, how many micrograms per ml of serum you had. It was really a….And you also measured it in a very basic machine, a densitometer, which really was so… such a simple…
SM: Laughably simple. Even a high school student could operate it. It would just measure…it measured the turbidity of the thing. And there weren't even…What you did was, you put the tube…the culture tube directly into the machine…a slot in the machine and then you turned this knob until this needle hit the middle hairline indicator. And then you read off what was on the dial that was the optical density of the medium. And so, you know, a high school student could sit there and just take all these things and write out, you know…Somebody would give you a ruled sheet of paper and you would put down the number of the tubes and there was a grid of tubes and a grid of paper and you looked at the thing. And so, you know, you were basically the com…the automatic computer. Now all these things are automated, of course.

DS: So part of his genius was he figured out how to get useful, reliable work out of these kids.
SM: I take that as a sort of a back handed insult. But that's OK. No, I was pretty reliable. No, he taught them that they could contribute to a scientific enterprise even at the age of 14. And that was Seymour's gift to all of us. That we were actual…We wanted to be scientists. We came here wanting to be scientists. Had we gone to any laboratory in the country, they would have laughed at us and kicked us out. 'Cause we didn't have any credentials or courses or *nothing*. Seymour threw…When I started at…when I was 14, he made me buy the Methuen monograph, *Vitamin B12* by E. Lester Smith. And you know when I was 14 he made me buy the Methuen monograph, *Vitamin B12,* and I didn't understand a freaking word of it. But ..
DS: So there were many, many like you who came.
SM: Yes, on Saturdays, the place was..
CB: it was mobbed
SM: was mobbed with high school students.
DS: What kind of pipleline did he have from the schools? Was it public schools or…
CB: Well, every day or every week two kids would come from Bronx High School of Science…"My mentor told me to look you up".. So
SM: That was kind of a standard pipeline.
DS: Is that the school you attended?
SM: No, I went to Brooklyn, to Abraham Lincoln High School. That's where…And I was very fortunate to make the connection., because there was no public information about Haskins Laboratories. You couldn't google Haskins Laboratories.
CB: But we were in *Green Medicine*. There's a book out that I put in this edition. It was called *Green Medicine*. It had to be published in the 50s.
SM: No!
CB: No?
SM: No! It was published in the 60s. [*Green Medicine,* 1964, Margaret Kreig*?*] Yeah. It was published way after…
CB: I didn't have my copy. I would have brought it in.
SM: But it describes the Haskins having tea with all the high school students. And what a day at Haskins was…
CB: Seymour's in there. It's really neat. The other thing I was going to mention is that the other thing that Seymour did is he designed all his own glassware. And these are called Erlenmeyer flasks. And this is not the exact, you know, example. But the idea is there. What he did was design a flask with a very flat bottom so it had a lot of surface area. And if you put like 5ccs of media in this flask, you would spread it out, and you would have a very big area for interchange of oxygen with the medium. And that's the other thing that he did. He designed these flasks and, you know, we have hundreds of them. I don't know where… I can't find *one* of them. I have them at home, I don't know where. The ones that don't have the screw top, flasks.
NY: The ones with the cap? The plastic cap. Donna has them
CB: Yeah. She's out.
SM: They have these polypropylene plastic caps that you just put on top of them. You didn't screw anything on them.

CB: Yeah, you didn't screw ..cap. You just had a cap that you would drop on. So you would autoclave pyrex baking dishes like lasagna pans, right? And you would have like 25 of these flasks in a lasagna tray. Remember that? Yeah. Everybody got free lasagna trays when we stopped doing the experiments.
CF: He's reminding me a little bit of BF Skinner. Because….I've read his autobiography, and he was brilliant in terms of his ability to think about learning in ways that people hadn't thought about it before, but he was also great in designing apparatus. And really the Skinner box became something that everybody used for decades. And it sounds like Seymour was similar.
CB: Oh Yeah.
SM: But Seymour could…The one sad thing about Seymour is that…was his hypercritical persona. That he just could not stand…he could not stand pomp, he could not stand puffery and he couldn't stand…he could take criticism. He just stand right back there and give it to you.
NY: Sometimes he kind of enjoyed it
CB: Oh yeah.
SM: Sometimes he enjoyed… he loved it that anybody would even think that he was his equal. And I invited him…When I was a graduate student at Syracuse University, I got him invited to speak to the department of Microbiology where I was in the molecular biology group. But I got him to speak to all the graduate students and the faculty. I was so pleased. It was like 1971, and Don Lundgren was the chairman of the department at the time. And he promptly…He promptly proceeded to insult the faculty and to ingratiate himself with the graduate students. And at the end of his talk, he would ask questions based on his talk and to see, you know, if people could extrapolate from the ideas he was giving. And so of course he asked one question. I can't remember what the question was, but I can just remember how things *went*. And so he asked the question and the chairman of the department raises his hand. You know: "I'm going to show everybody." So he answers the question, and Seymour goes: "Wrong! Next." So I'm going: "Thanks a lot Seymour. I really appreciate it" I knew he was going to do it. But it was just to have the honor to have him come to Syracuse, stay at my little apartment was..But that's who he was. If you were one of his, he loved you…Criticized the hell out of you. But he would protect you. And he would… if anyone criticized your paper, you know, he'd tell you..he'd tell you how to fix it, you know. He loved deflating egos of scientists who…and sometimes he was a lttle bit too enthusiastic about it.
DS: I get the picture
SM: And that's where…I think that's where he could been…he could have made a bigger mark in the world. Don't you agree?
CB: Yeah. I think so. Oh sure! I mean he was his own worst enemy.
SM: But he was such a unique man; you know, we'll not see his like again. And many…Frank Cooper, Caryl Haskins were all unique in terms of their talents and the combination of talents that they had.
CB: But the idea to put together a *lab* without transcripts, without a requirement to teach. That's where they really wanted.
SM: Seeing the original transcripts [Pat Nye's oral history]. I ask a quick question: Who funded the original Haskins Laboratories?

CF: He got an inheritance from an aunt, I think it was.
SM, CB: Caryl Haskins?
CF: Caryl Haskins did, yeah. He got $750,000 from an aunt who was somehow a companion of George Eastman, but it wasn't Eastman's money, it was her family money and she died and left him money and that's what he used to found the laboratories.
SM: And this was in 1930 something?
CF: 1935, I think.
CB: So think what $750,000 in the 1930s.
SM: That's huge.
DS: They founded the lab the year that Caryl Haskins got his PhD, 1935.
SM: So wow. That's a lot of money. So Seymour had always said to me or in conversation that he had a job…You know, he didn't have to worry about tenure, he had a job for life, he didn't have to sit on any committees, he had no obligations, he could do what he wanted. And that's really what was unique about the laboratory itself. How did…I had heard that the 18 minute gap in the Nixon tape.
CF: Frank Cooper was on that
SM: Frank Cooper!
DS: Frank Cooper..He was a member of a three man committee that…worked on that.
SM: I remember that. That was on the Nixon tape.
CB: Not only that. You know what they did? Well, this is preaching to the choir but, didn't they perfect like voice analysis. Like that if you were…the FBI and you were taping somebody, that you could identify the voice on the phone? They pioneered the techniques?
54:22
DS: No, they were actually critical of using those techniques, basically. Because they showed that more was claimed for them than should have been. That was Cooper's stance on that.
SM: Ah…
CB: OK. But I mean…
DS: Isn't that right, Carol?
CF: I don't remember to be honest. I really don't remember. But certainly is no something that our version of Haskins Laboratories contributed to.
DS: But can we back up just a minute. Stuart, you started to say awhile back that Seymour's two big contributions… and the one that I remember was…is micro…
CF: Developing microbial assays
DS: microbial assays.
CF: But you didn't get to number 2.
SM: Oh, Number 2 was the? Number 2 was the use …Number 2 was the revolutionary concept, I think, that he espoused that protozoa could be used as models for mammalian metabolism, and therefore we could learn about disease and nutrition of the human by using the appropriate protozoan model. And this is something, that… Cy can tell you about this because this did not sit well with the world. Even though Seymour had very good evidence from the various systems he

was looking at, Tetrahymena and Crithidia, I think were the first, you know. He used to call Tetrahymena a humanoid protozoan. Remember?
CB: Right.
CF: How would he…what kind of evidence would count as evidence that you could use…
SM: I'm going to defer to these guys [CB, NY] because I'm not a nutrition…I'm not a protozoan guy.
CB: Well, he, you know, he believed that *well*, that their metabolism was comparable to mammalian cells. So if you had anti tumor agents, you could use Tetrahymena as a screen and eliminate, you know, certain classes of compounds which didn't work, because they did not work on Tetrahymena. But that wasn't always true. All right.
SM: While, he was espousing this, which was in the 60s?
CB: Yeah.
SM: Joseph Burchenal at Sloan Kettering was setting up the mouse leukemia assay which became the…which became the standard assay for looking for cancer cells. And Sloan Kettering had this huge facility in Rye where they made new chemicals for …They had this huge organic chemistry lab which was already set up there and they were…and Joe Burchenal was there with his thousands of mice and they would assay the chemicals in the mice using the leukemia that was transplantable from one mouse to another for [L-pho…??] leukemia. So you know I happened to go from college and Haskins to Sloan Kettering after my doctorate. So I became very familiar with the whole thing. So the problem was…and the other thing that cancer research was becoming excruciatingly political. If you read the brilliant book by Mukherjee, Siddhartha Mukherjee, I think, wrote *The emperor of all maladies,* about cancer. He got the Pulitzer Prize for it. It's a fabulous book. It talks about how the American Cancer Society got started and how the personalities of all the people got involved. So once the American Cancer Society and the Jimmy Fund and all these highly political charitable organizations and Mary Lasker in particular got started with saying: "This is what we have to do to cure cancer" which is to grow these mice and test them with all these things, any alternative scheme was seen as a threat to the system. Especially when it was espoused by someone who wasn't an MD. And, you know, the cancer research field had always been more political than the scientific in many ways, and it has gone down many, many, many wrong roads in the scientific sense because of the political pressure that was put on it. And so one of the things that Seymour suffered from was the scientific milieu at the time that poopooed anything that wasn't a mouse or human or a tissue culture cell or HeLa. You know HeLa was becoming…this was also the time that HeLa cells were put into culture and HeLa…and everybody became all excited: "Oh yeah. Cancer has all been cultured. We can use that" And eventually things moved out of the mouse model into cancer cells if not HeLa. So what you have to look at biologically is the milieu into which this brilliant idea was dropped. It was dropped into basically a field that had been plowed and burned and salted and limed. And none of Seymour's ideas were going to take root and grow in that hostile, hostile environment.
CF: That's sad
SM: And Cy can tell you that when he…they applied… what do you do when you have a great new idea? You apply for NIH grants.

1:00: 07
CB: Yeah. And then the first thing that.. well in my case it was, trying to use Crithidia which is a mosquito parasite. Not a human parasite at all. NIH…
SM: Neither are Tetrahymena or
CB: Right. But I couldn't get funding…my NIH grants…until I began to use a human parasite so that we…I had to go to Seymour in the early 1970s after a series of grant rejections from NIH and say "Seymour we have to get animals and we have to get animals that support a strain of sleeping sickness of Trypanosoma" that, you know, is a pathogen "and start testing and doing metabolism of these,,,of the real parasites."
SM: But the good side effect is that Haskins Laboratories, through Cy's research, was instrumental in the discovery of a cure for sleeping sickness. And that was the other great contribution of Haskins Laboratories, which Seymour was involved with in Cy, which you should not forget even though it's not mentioned there.
101:18
Because truly you know the person you're sitting next to is one of the few people that ever really developed a cure for a disease. And because Cy is such a humble human being; I think that Cy had a reaction formation to Seymour and turned out to be excessively humble as a result.
CF: I see.
CB: Stop.
SM: But yeah. So, I'll toot his horn if he won't toot his horn. Yes you are sitting next to a man without whom the….Did you ever tell the story…them the story about Vaniqua?
CB: Oh Vaniqa. That's a good story. Well I don't know…
SM: Well that's alright. Its not really Haskins. Its post…post…
CB: Well, you know. Just talking about the models…
SM: Just to tell you about the models and the milieu and the culture of the world we live in. I think it's a wonderful story in that sense as being truly an example…So you go ahead Cy. You tell the story.
CB: Alright. Want me to tell it? Alright. So in 1980 there was a compound called DFMO. Capital DFMO. It's…which was… Merrell Dow had developed this as an anti tumor agent. And they had tested it you know…
SM: It attacked the basic enzyme that causes the synthesis of polyamine which unfortunately is needed for normal and cancer cells
CB: So the bottom line is that this was tested as an antitumor agent and it failed. But because of its link to this polyamine metabolism I was studying I got the compound from Merrell from a guy I am still friends with at Merrell, and we tested it here in mice and we found that it cured the infection. And…OK. So now, it's 10 years later, and because it had gone through clinical trials as an anti tumor agent, you could go ahead and test it in people who had the disease, because we knew it was not going to kill them.
SM: Which was African sleeping sickness
CB: African sleeping sickness, yeah.
103:40

So in 1980 we published this paper that this compound cures mice with sleeping sickness. So we go to 1990…
SM: Yeah but during this time the World Health Organization has contacted you and…
CB: Yeah but right. We get grants, we do the work, we do all the biochemistry and stuff.
SM: And then Merrell Dows funded the first clinical trials in Africa, right?
CB: Right. Yeah but the thing that…
SM: Don't forget. That's when they called it the Ressurection Drug because it took people who were…comatose
CB: Comatose
SM: And made them wake up within 24 hours. So it was called the Resurrection Drug. *Don't* minimize it. Christ. You know.
CB: But the irony of this, alright? We get to 1990. And WH…I was on somebody's study sections for WHO and they…WHO can't buy this stuff, it's too expensive, nobody will make it. And Merrell Dow shuts down the manufacture of it. And at that point, you know, you couldn't get it. Even though it was cured.
SM: Meanwhile people are just dying of sleeping sickness. [and?] animals
CB: Alright so what happens is…A…What's her name now…the…
SM: the [??choreographer??]
CB: There's a 60 Minutes program comes in in February of 1990, I think? I have to look it up. But essentially it's this lady who's an MD, who's, you know, like a missionary. She works in the southern Sudan with all this fighting and, you know, all of that. And she runs a sleeping sickness clinic. And she goes and explains that the only drug that they…is available is something that is solublized in propylene glycol, which is antifreeze.
SM: Which is poison.
CB: and that blows up the veins of these people. And they don't want to get it and it kills 5% of the people that get it. So the bottom line is that there is this compound that's available but it's called DFMO, but it's too expensive to make. So no drug company will take the chance and make it. So
SM: Because it's only Africans who have it.
CB: 24 hours later, after the show, the headline in the Times is Drug Cures Sleeping Sickness but is Not Available. At the same time, alright, what happens is…their dipiliatory agent is released on the market called Vaniqa. Vaniqa…
SM: Well…Vaniqa is …was… the purpose of Vaniqa was people who get laser hair removal. Get laser hair removal, the hair grows back pretty quickly [most times?]. But people were testing this compound and found that if you applied it to the skin where you did the laser hair removal, it would slow the regrowth of hair. And they called it Vaniqa. Except Vaniqa was DFMO.
CB: It was 20% …It was 20% DFMO. So the deal was…they wouldn't synthesize DFMO for the Africans because they couldn't get a return on it. But, you know, it was OK to produce this stuff so…as a depiliatory agent. So that was really. So that all came out in the Times.
SM: It came out in the Times and then it went back on 60 Minutes. And they interviewed you!

CB: Me? No.
SM. No they didn't interview you.
CB: Nobody interviews me. It was like Seymour. But really that was the interesting part. And really kind of from there they took off. And it began…The idea that, you know, you couldn't…you had to share your resources and make drugs for Third World. Like what Gates is doing and, you know, spread the wealth around, you know.
SM: I think…I think it became law.
CB: I'm sorry?
SM: Didn't it … did it become law that you had to…?
CB: Yeah.
SM: You had to…Or they gave… [Marion Merrell Dow] gave the patent to…
CB: Oh they gave...Marion Merrell Dow was very good. They gave the patent to WHO. They told them how to synthesize it. They just had to find somebody to make the ingredients. And the ingredients were expensive. You know, even then it cost about $500 a gram or something. It was not cheap.
SM: Wow. Even in bulk.
CB: Yeah. It was a lot. Not only that, they had a coronation…a fluorination reaction that would eat through the stainless steel reaction vessels. They had an explosion in Strasbourg that killed people. Couple of workers, yes. Production yeah, production of it. So they had a completely…they had a weak, you know, fermentation tank. Reaction tank.
SM: So there you have it. So Haskins became instrumental in finding a hair growth inhibitor…that incidentally happened to cure sleeping sickness.
CB: Yeah, you know, but that was…
SM: But that's was really great example of misguided priorities in the United States. A classical example, but we do that.
CB: You running out of tape too?
CF: No, I just wanted to…
END OF FIRST FILE
DS: The depilatory stuff…What did you call it then?
CB: Vaniqa
SM: Vaniqua…that was the brand name Vaniqua…Vaniqa
CB: But it was 20% DFMO. That was the active ingredient.
DS: Yeah, I got that, but how come it…this stuff would have…wouldn't have been too expensive to be a practical…
CB: Well that was the thing! They were…I don't know
DS:…to be worth paying for
CB: O sure! Because you had western people and physicians writing prescriptions and drug stores…and so forth
DS: That's a terrible, terrible…
SM: It's a great story. It's an *American* story.
CB: Well!
SM: It is, it is.
DS: So what is the situation now?

CB: So I was going to say, what happens is, initially they used it alone. To cure, you must understand. They had to infuse it 4 times a day, usually for 2 weeks and you would cure a patient with sleeping sickness. But if you've ever seen some of these rural clinics, you don't want to do IV for 4 times a day for 2 weeks, because the st ups are expensive and all of that. So they were looking for a way around it. Well what they have to day is a combination of a drug called Nifurtimox which…and DFMO and they give it in combination for a week. Nifurtimox can be given orally as tablets. So they give that for 10 days. But the big thing; is they cut the administration of DFMO in half. You can give DFMO twice a day for one week with this Nifurtimox as a combination and you can cure…
DS: In tablet form
CB: Yes. So Nifurtimox is a tablet. The DFMO still has to be given IV. But its once every 12 hours instead of 4 times a day. So the idea is now you have basically half..you've halved the treatment time and halved the amount of material that you give because you're using it in combination. So now that is the frontline therapy for DFMO…for sleeping sickness.
That's a you know. The other thing is that we've done recently…In 2004, I had a lot of medical problems. And I didn't think was going to come back from it. And Nigel can tell you what happened. I went from 200 lbs to 140 lbs, and I had, you know, esophageal cancer and I had L-1 vertebra collapse on me. So I had a year and a half in which I had four or five six-hour surgeries of different natures. But the bottom line is, in 2007 a group called DNDI, Drugs for Neglected Diseases Initiative…DNDI. And that's…Dndi.org is their website. So very simple. And they came and they asked us if we would be willing to synthesize, screen a series of compounds. They would pay for it; they had money from Gates and they would pay us. Basically it was a grant. So for 7, seven, six, seven years, right Nige?
NY: yeah
CB: We have been screening compounds and, not that we…we mainly just screened it in our animals. But there's compound out that's going through stage, phase 2 clinical trials and it is excellent ; it cures a central nervous system model and bottom line is that you can give it in low dose and short term and it will cure. And not only that, it will stay in the blood stream of people for quite a long time. Meaning that it can be given as…it may be given as a prophylactic in addition to curing a clinical infection. So..
DS: How much does it cost?
CB: At this point with Gates behind it, we have no idea how much. Do you know how much?
NY: Well my impression is that it's not…it's not that expensive and it can be given as a tablet for [??] a single does for a cure. So all of that together is a lot cheaper and its easier to administer and all of that.
CB: So that may be, I think, the coming thing. So, I don't know. But we played the lion… a big role in that. So we are probably at the end of that…but we're still hopeful that other things and, yeah.
DS: So parts of this story are told in things that you've sent us.
CB: Yeah, oh yeah.

DS: Is there another thing that tells the whole story of sleeping sickness and.. at Haskins?
CB: I don't …Is there anything? Well some of the stuff that I sent…
NY: Some of its in the book that what's his name from Merrell published?
CB: Peter McCann?
NY: No, his daughter wrote it about…right?
CB: Oh. Let me see if I have it.
SM: I didn't know that. I didn't know anything about a book. Peter McCann's daughter wrote a book?
NY: The president of, the CEO of Merrell. What was his name?
SM: Oh, I don't know.
NY: You always say that
SM: But Peter was Cy's contact.
NY: Peter's in there.
SM: You know Peter and I went to the same…We got our PhD's from the same mentor. Syracuse University.
END OF SECOND FILE
SM: He [Seymour] was getting his PhD with Sumner. He was also instructing Norbert Weiner in cybernetics on….
CF: Well, he was one of the, I guess, puffed up people that he enjoyed destroying
SM: I don't know if Weiner was puffed up. I think Seymour actually taught him biology..some biology.
CF: Is that right?
SM: Yeah. I think he liked him. He spoke fondly of him actually. But I am sure there were other puffed up people in the classical Yankee professor tradition.
CF: But I thought …so maybe I'm wrong. I thought that Hutner, Seymour, got down to MIT because he was working with Cooper, somehow, on Cooper's dissertation that.
SM: I don't know. Might have been. Oh! Look at that. *It started with Serotonin*
CB: *Serotonin*. This is the story. This fellow, Al Sjoersdma was a great biochemist.
SM: Oh! That's who it was OK. I know who he was, yeah. He was the head of, yeah
CB: Right, and he was the head of the Merrell Dow Research Institute, and he was there and pioneered the research into these compounds. And the bottom line is that he allowed…when we got our data with DFMO, he flew to Geneva. Worked with the WHO to initiate clinical trials in Africa. And if you look up, there's a whole chapter on this stuff. I wonder…
SM: You must be in there.
CB: Oh yeah, we're in here.
SM: Well, there you go.
CB: So.
SM: Go to the references.
CB: Alright, let me see. Here this is…Yeah, this is…
CF: There you are.
CB: So there's a lot of the material here. I don't know if this was a vanity book or what. But..
CF: I don't think so. Doesn't look like it.

CB: Yeah. But this is the book. *Starting with serotonin* by Ann Sjoersdma, and she's the daughter of Al Sjoerdsma who is a very famous biochemist from NIH. And this is the guy. He passed away, and there is a memorial…I'm going to go to. It's in September or October. Anyhow, we're mentioned, the Lab, and there's a whole chapter on DFMO. So I think its almost better to just… if you can get a copy of this…
CF: Yeah, I'm sure we can.
CB:I mean I can try and Xerox this, but it's a lot.
CF: No, no. I can look for it on Amazon. I'm sure it's there.
CB: So it's just…I'm sorry. I'll get out of the way. I'm just going to grab a little…Oh, watch it watch, watch. You dropped the notes there.
….
DS: I'll make a note of that book myself.
CF: Yeah, it's called *Starting with Serotonin*.
CB: Good, Nige. I mean you know. If you can get it.
SM: It is on Amazon
CF: Oh, it is. Thank you.
DS: Serotonin. And the author is…
CF: S, j, o, e, r, d, s, m, a, Ann G.
CB: S, j, o, e, r, *d*, s, m, a
DS: S, j, o, e, r, d, s, m, a
CB: That was good Nige. I forget about that, you know. Why should I forget about it? Well. But its' good. For the Lab.
NY: That's right. You're too modest. You need to remember these things.
CB: Yeah, you know, you ought to tell Charlie Gumbar about this.
NY: Yeah. I wonder if he knows actually. He may not.
CB: You know? I wonder if Pace is in here too? You know, just on the… Or Haskins Labs, Pace, P-A…No, Pace is not…Haskins Labs…[looking in index of Sjoerdsma book]
DS: So we sent these questions to Cy. I don't know if you have seen them.
SM: I don't think I have seen them.
DS: Well a lot of them have probably been answered by you already but maybe I can go through some that maybe haven't.
CB: Yes.
DS: What can we reconstruct about Seymour's relations with Haskins and Cooper during the 1930s and 1940s.
SM: I'm afraid I can't help you there.
DS: Well, we know from this, these tapes [Nye Oral History], Seymour's comments and whatnot, that in the work they were doing on effects of radiation on animal and plant tissues on reactions like photosynthesis and so forth. These were interests that Haskins and Cooper acquired when they were working at the General Electric research labs in the middle 30s. And GE..I gather that GE had a monopoly on producing X-ray equipment both for diagnostic and treatment purposes, and so they wanted to know a bit more about what X-rays do. And that's how X-rays…how, why radiation research got started at GE research labs. And Haskins who was originally doing sort of straight chemistry was brought into that field.
SM: And Seymour ended up helping him with that.

DS: They needed…They needed a…somebody with…a biologist that they described it, who had …who knew a lot of chemistry. That 's the way they described it.
SM: That was perfect. Seymour was a biologist who knew an awful lot of chemistry.
DS: They found Seymour at Cornell.
SM: With Sumner.
CB: Yes. Right.
DS: They found him…
SM: That's where he was.
DS: Through…Yeah, through
CF: Someone named Nabel
SM: Nobeli
CF: N, a, b, e, l? Well Pat Nye might have spelled it wrong. So do you know..
SM: N, a, b, e, l. No, I don't. Or was it Knabel
CB: Maybe, Knabel, K, n…
CF: Someone who got a recommendation from Barbara McClintock and conveyed it to Caryl Haskins. That's who Knabel or Nabel was.
SM: Isn't that something. What a connection.
CB: Wow.
CF: So, he…*he* was a student was a student of McClintock's at City College, right? Seymour was, I mean.
SM: Yes.
CB: Yeah.
SM: That's right. He was a City College graduate.
CF: And somehow this Nabel person…
SM: That's right. That was not a job that Barbara McClintock really wanted, but it's a job she was forced to take, because it's the only one she could take.
CB: Well, she was at…
SM: Right her biography is…
CB: So she taught Seymour?
SM: Yeah, isn't that something.
CF: As an undergraduate.
CB: Unbelievable.
SM: As an undergraduate at City College
CB: Unbelievable
SM: So one of the best minds of the 20th century in biochem…in genetics, you know.
CB: Unbelievable. Really unbelievable.
DS: Here he says: "
CF: Bernard…
DS: "Nabel," N, a, b, e, l, "got the the message from Barbara to us about you" That's what Haskins said on the tape. "And that's how we headed for you" So they found him at Cornell and they sort of …
SM: drafted him
DS: They drafted him. They dragged him away and
SM: Actually I think the polite word would be: "recruited" him

CF: And Cooper was working on his PhD at MIT at the time and I think that's how Seymour got to be at MIT. Helping out with, somehow helped out with Cooper's PhD dissertation.
CB: Wait. Wasn't it Frank Cooper…he was studying the effects of radiation, no?
DS: Yes. Yes. He had started out to do a dissertation on spectroscopy and had gotten, somehow through Haskins influence partly.
SM: Sure it wasn't Bernard Nobel?
CB: Oh, it could be
SM: You know who Bernard Nobel was?
DS: No, b, e, l?
SM: N, o, b, e, l He was the Nobel of the Nobel Prize
[BOTH HUTNER AND HASKINS PRONOUNCE THE NAME "NAY-ble" on the Nye tape]
CF: He was the Nobel Prize guy? Well, that's…
9:08
SM: Son of a gun.
CB: Wow. That's really incredible. I did not realize that that's how Seymour knew Barbara McClintock.
SM: No, sorry. It was not Alfred Nobel, it was Bernard Nobel. Oh. It was Alfred Bernhard Nobel. But I don't know what they called him.
CF: Bernie.
SM: Maybe it was him.
DS: Alright so. They were together at MIT for some months at least in the middle '30s. And then Seymour went back…I'm just trying to trace the events as I understand them. Seymour went back to Cornell to finish his PhD…in plant physiology?
SM: You have to realize things were so primitive at that time. In a…really.
CF: Yeah.
DS: And then it's unclear sort of what happens. Whether he had a position, a temporarly position at Cornell.
CF: He worked at the Vet school, was it?
CB: Yeah, but…
DS: Eventually he was involved in the…
CB: He went to Albany. He went…
CF: Yeah, yup. Some Health Department, State Health Department
CB: Right. State Health Department in Albany
CF: But that was after the Vet school
DS: But that was after the Vet school. First there was the Vet school.
CB: He worked with trichomonads, He worked with trichimonads at.. Which is really, you know… He actually developed a method that he taught farmers of how to sample the animals, the cows, for trichomoniasis.
SM: Right. yeah
CB: This is like…I mean…this is fascinating!
SM: Because of…because of his eclectic education. Just think. He went through chemistry, veterinary medicine.
CB: Did veterinary pathology.
SM: Did veterinary pathology, protozoology, you know.

CF: He was somehow involved in the Botany Department at Cornell as well.
SM: Yes.
DS: When he was a graduate student, he made a discovery that he refers to here [in the Nye recordings]. He says: "When they tracked me down to that lab, I had a homemade fractionating column and I said: this green algae Euglena needs something only found in animal materials. But I can't talk to anybody about it."
SM: That was [Grant Neil??], right, the Winogradsky column guy?…Yeah, the Winogradsky column. That was one of the first things that fractionated dyes and material, and it was very old and very few people used it. It was a silica column, wasn't it?
CB: My understanding of a Winogradsky column is you took a…the sludge that you find in the bottom of an anaerobic environment, the swamp and you pack it into a 500 ml graduate, and you shine a light on one side of it and you get a layer of different colored photosynthetic bacteria. So you get the purple, green, yellow…all the…Right? You get all different…
SM: That's right. That's was the Winogradsky column.
CB: That's the Winogradsky column.
NY: That's the opposite of […??]
CB: My son has one. Jimmy has one at home ther
SM: Yeah. It's an echo system. It's basically a perpetuating echo system.
But it is a fascinating…
CF: So I thought the… what he was talking about was a discovery that he couldn't publish, that Euglena needed something found only in animal materials. He couldn't get it published. He had to get it published in a German journal, because nobody would believe that plants consumed animal..
SM: Yes, people wouldn't believe that…he found a liver extract
CF: A liver extract
SM: That Seymour was able to meet the Euglena requirement with a liver extract. And liver is a great source of vitamin B12. But nobody knew at the time that the liver was…what the liver was doing here. And as Seymour said, there was a very buttoned down…I believe…I don't know…But Seymour's…I mean it's too bad that the great people who…the people who could articulate the history of that time are dead, they're all dead. Everyone of them.
CF: Yeah. We're kicking ourselves for not starting when these guys were alive.
SM: It's too bad, because Herman just died last year, this last winter. But he was demented. So, I don't know how long he had Alzheimers. But…
CF: Oh, there…Speaking of people who aren't available, you might ask…
SM: Have you talked to Reed Hutner?
CF: No. That's his son, right?
SM: Yeah. Why don't you talk to Reed?
CF: That's a good idea.
SM: Not that Reed was that close with this father, but...
DS: Cy said that he had called him to ask…and he wasn't able to contribute anything to the question that *I* was asking about his father's work in the '30s and '40s.
CF: He was the son of his first wife, is that right?

SM: Yes, Reina and he had a horrible upbringing. Seymour was not…as I understood. He made the poor kid every night the same dinner, you know. Charred hamburger and a baked potato you know; fried hamburger and a baked potato, or something like that.
CF: He wasn't one of those high school students who came to the lab?
SM: Seymour, Seymour probably had…you know, if one were to..if one were to take Seymour and try to identify what kind of a personality he was by today's definitions, one would probably say he had a touch of Aspberger's, because he didn't care about other people's emotions and he was terrible at reading other people's emotions. Wouldn't you say, Nigel?
NY: Oh yeah. That's for sure.
SM: Yeah, So, so..he was always convinced in telling you of his own…Although he was af…What you learned of his affection for you only peripherally. You know the only thing you usually heard from him was he'd give you criticism. But he was always very convinced and voluble about his own work. So, that's a very Aspbergian…and very preoccupied with things rather than people. But I've never seen somebody who was so good in the arts, the literary arts. That kind of blows …I was trying [??…] that Seymour's personality…You know, because to hear Reed and Herman and Silvia Baker talk about Reed's upbringing after Reina died. It was horrible. Right, I mean, Seymour cooked the same…
CB: Well, Herman Baker really took care of Reed.
SM: Because..Herman..
CB: Because, well, Margarita was chairman of the department there at medical
16:53
SM: Yes, but there must have been a period of time between Reina's death and when Seymour met and married Margarita. Was there?
CB: There was. Not that long.
SM: Because Reed basically…Herman used to say that Seymour used to make a burnt hamburger every night and feed that to Reed.
CB: Or a hot dog.
SM: Or a hot dog.
CB: Well that was dinner. But that's true. That's true.
SM: So you know…And I was saying maybe Seymour would be defined by today's personality terms as somewhat Aspergian. What do you think?
DS: What line of work is Reed in?
SM: He's a history professor.
CB: Well, yes. He's a history *major*.
SM: He *was* a history major.
CB: Yes. He was very bright. I mean, as you might think.
SM: I thought he got a PhD in history. And he was a professor
CB: No.
NY: Is he an archivist or something?
CB: Yeah, more of an archivist.
DS: Sorry I didn't hear
CF: Archivist

CB: Archivist, yeah. He does a lot of work now…He does retirement…He's retired. He does a lot of work with …oh come on…with HMOs and… And he does volunteer work, but he knows his work. I mean, maybe he did social work, I'm not…It's a really good question, but, you say an archivist then you got a reason for it, so.
CF: But he never worked at Haskins Laboratories
CB: Oh, no, no, no. He's totally anti-
CF: Antiscience
CB: Right, yeah
DS: Well that's a common pattern, I think, with kids. They don't identify with the parent's
CB: Well, Reina died in 1955, and I have that…Seymour married Margarita in 1956
SM: Wow. That was quick.
CB: See I have this on page 126 of the transcript there. But you're going to have this [Reina's obituary?]. So that's what I got. Because Donna printed out Reina's you kmow obituary. I gave that…You have that somewhere…the obituary. I don't know where it is…there. I'll copy all of this.
DS: Well, Seymour came to Haskins Labs…He was… had been working with Haskins and Cooper in the middle '30s, but then he was doing other things, for a few years the Vet school, the New York State Department of Health. And he came back to work with Haskins and Cooper during World War II. They seemed to say either '43 or '44. And so we were curious about what he was doing when he came back. He says that began as Paul Zahl's assistant. And then Cooper remarks that they had been doing some work on traumatic shock,
CB: Yeah.
DS: and radiation for tumors,
CB. Right.
DS: and gram-negative toxins. I don't know what that refers…
CB: gram-negative bacterial toxins
20:40
DS: What does the phrase "gram-negative" mean?
CB: They're gram-negative bacteria
NY: It's a stain invented by…first used by Gram [Hans Christian Gram]…which separates the two main classes of bacteria into gram positive or gram negative and it's based upon a [polycycloid?] in the cell wall. The absence or presence of it.
DS: So Zahl is pretty much a mystery to me. I know that he went off to South America and became an explorer or sorts.
CB: Well, yeah, but it's interesting.
SM: And he wrote *The lost world*?
CB: Well, yeah. That's right. He was a pioneer in color photography and he published a lot of stuff in the *National Geographic*.
DS: Right, yeah. I knew that
CB: And early on, I …in fact I was over at my son's house and I saw this book on fishes of North America and it was by Zahl, Paul Zahl. The same guy.
DS: The animal "fisher"?
CB: No fishes of North…
DS: Oh fishes, I thought you said fishers, OK. I'm sorry.

CB: No. Fishes of North America.
DS:OK
CB: And he's got salt water, and fresh water fish.
DS: Yeah. OK. I didn't hear you.
CB: And it's Paul Zahl. And I remember Seymour talking about him as an explorer. And, you know, Caryl Haskins went to…
DS: Yeah. He wrote a book on the Amazon too.
CB: Yeah. And the ants. That's the thing. So he identified all these different ant species in the Amazon and elsewhere too. It's really amazing. I…
DS: But Paul Zahl's laboratory phase. We don't know much about that.
CB: I don't know. I… Do you know what? It would be…probably he was working with tumors, wasn't he? Who was…?
DS: You know what, that's mentioned in the… on the tape.
SM: Was it with fish?
CB: No.
SM: No?
CB: No it was mice.
SM: BALB/c mice or mammary tumors?
CB: I don't know.
SM: That rings a bell in my head, mammary tumors.
CB: You know… remember Andy Nowak?
SM: Yeah.
CB: So he was working with some pretty nasty stuff.
SM: Where were they doing that?
CB: Remember the incubator room?
SM: Yeah.
CB: In the front?
SM: Here.
CB: That was an animal room. No, not here.
SM: Oh OK.
CB: In 43rd street. That was an animal room.
SM: That's right. God
CB: This is like…you know…Together, we..you we can piece….We never saw animals in it, but that's what it was used at. This is on the 3rd floor in front of 43rd St. As you come off the elevator you would make a left turn …
SM: But Haskins was on the *fourth* floor.
CB: Umm. The fourth..yes the fourth floor
SM: Seymour's part was on the fourth floor.
CB: Three, four and five.
SM: Luigi was on the third as was Cooper.
CB: Right, was on the third, but we were on the fourth floor. And if you made a left as you went out of the elevator…
SM: I remember that because occasionally a mouse would escape. Oh yeah. I remember that.
CB: Well you were there …see I actually don't remember that they had animals.

SM: Yeah. I remember occasionally a mouse would escape when I was there from '61-'6[5?] Before they moved here in '70.
CB: Well, I think that Paul Zahl was…
SM: Yes. So…God.
CB: How about that? So I think that Paul Zahl was involved in that. Although what exactly it was, I'm not sure. But I know that Seymour said that… when I would ask who's …He would say: Oh, he's an explorer, he's now in South America, you know, he works for *National Geographic.* So he did a lot of that. Yeah. But what exactly he did, I'm not…I don't know. Maybe Seymour mentioned it, but I don't remember what he did. Isn't that terrible? We…there's this chunk of his history that we…you know.
CF: Did he [Seymour] have any papers? A sad thing about Caryl Haskins and Frank Cooper is that there were lots of their papers at Caryl Haskins' house in Westport, and they were just apparently disposed of on his death, because he didn't have any kids and…
SM: How sad.
CB: Really, yeah?
CF: Yeah. How about Seymour? Were there…are there correspondence or papers or anything like that?
CB: Yeah. We have…well, we have papers. In fact I had one that I gave to Reed. And it says: "To Reina, Seymour" So I sent that, the original… But that was the only time I ever saw…
SM: Where…where were his…Did he ever keep…Did he keep his correpondence in the…? I know he filed everything away. You know, he had 5,000 notebooks, and..
CB: Well, you know what…Alright you know what happened? This guy from the…protozoologist, Nige, the guy from University of Massachusetts?
NY: Yeah. Mike Dolan?
CB: Yes, right. They archived Seymour's correspondence in the University of Massachusetts library. They came to us and asked, when he passed away, if they can have his correspondence to archive it. And I said, we're not going to get this offer again, so, right?
CF: What was his name again? Mike…
NY: Michael Dolan, D, O, L, A, N
CB: Right
NY: And that's because Seymour…Was he *the*…or at least one of the founders of the
CB: He was one of the founders
NY: Of the Society of Protozoologists
CB: Protozoologists, 1953.
26:50
NY: Which is now the International Society of Protozoology.
CB: Right. Right.
CF: And this would be UMass Amherst?
CB: Yes.
NY: Yes. And I have Dolan's address. [Department of Geological Sciences, UMass, Amherst, 01003]
CF: Great.
NY: […?]

DS: There's something from my list if I can interject it that I…a fascinating comment that Seymour makes on page 123 [Nye, transcript]; he says: "The issue now is did we or did we not come from a photosynthetic ancestor?" And I…"if we did, how much did we carry over or did we bypass that and go directly from the halophiles in a way that chlorophyl comes partly from heme"…I can't…
SM: Somebody knows the answer to that question because …from sequencing mitochondrial DNA and chloroplast DNA
CB: Right. And they can tell. Right
SM: Because mitochondria are…were originally chloroplasts. So… or bacteria. So..
CF: So that answer is no.
SM: I don't know. But somebody knows the answer, because…and I'm sure somewhere there's a database accessible to people who know how to do it and to read the sequences that could tell them exactly what the ancestry is. Because nowadays its done all by computer databases and algorithms and…
CB: Molecular…oh wow, alright
SM: You don't really need to…
NY: That's Mike…
CF: Wow. Thank you so much [NY provides Mike Dolan's address]
DS: So, he ends this little….passage with: Maybe the two of you could just read this: Those four lines (p,. 123, same passage as quoted above], because it's hard to…
CF: Get the vocabulary
DS: Yeah. Get the vocabulary
SM: Here. This one. This one?
NY: At "Seymour:" ?[in the Nye Transcript]
DS: Yes.
CB: Well, that's what we just…
SM: What they're basically saying is the fact that chlorophyll comes partly from heme. That's a real…It's so spooky, Cy. I can't tell you how spooky it is for me. In vitamin B12…when I started working with Seymour in 1961, it was with…partly with the Euglena and looking at a factor of vitamin B12, which was left after metabolism, and looking at other org…other organisms that grew in response to this particular factor. And vitamin B12, the nucleus of it, is something called the porphyrin structure, which is a cage that holds a metal inside of it. And that caged porphyrin structure is common to many important organic molecules in both plants and animals. In plants, it's impor..the cage holds iron, which is chlorophyll. In vitamin B…
CB: Magnesium, doesn't it?
SM: And magnesium.
CB: Magnesium for chlorophyll. And..
SM: And iron for heme. I'm sorry. You're right. Iron for heme. Shoot. Stupid of me. Sorry for that. I should know that.
CB: You know about […?]
SM: I *do* know that. [I took a year…??].
SM: So this porphyrin nucleus is the same cage in every little molecule. In plants, it holds magnesium, in animals, it holds iron. In vitamin B12, it holds cobalt. OK? But it's all a porphyrin cage at the center of these things. And, of course, in humans the

iron in the porphyrin is called heme and it's in hemoglobin that is the center of [living?]. So at the very basic molecular level of energy transfer, the only difference between the plant and the animal in the mitochondrial cytochromes which are heme-containing proteins is the iron vs the magnesium in the chloroplasts. OK. There are lots of other chemicals that are different, but…the metabolism is hugely different…but these little porphyrin molecules, you known, these complex little ring cages, called chelation, the chelate holds these metals in a soluble usable form by an organism. That's what Seymour is talking about here. Chlorophyll comes partly from heme. That's the cage of the porphyrin. In 1960-something, Seymour wrote a book about… a chapter in a book…and it had something about the rings in the…the porphyrins in heme. And the same thought was in that chapter. And he inscribed it to me, you know: To Stuart who will be cracking those…who soon be cracking those rings for himself. Well, right now, at the age of sss… 48 to the age of 68, I have been working with the heme nucleus precursor, and… with something called photodynamic therapy, which creates, not the heme molecule, but the porphyrin without the iron, which is called protoporphyrin, the last stage in the production of heme. You then add iron to it, it becomes heme. But protoporphyrin when you hit it with light, it absorbs the energy, and creates a state in which you can pass the energy on to oxygen and kill cells. And that's called photodynamic therapy. So I have been cracking the rings of the porphyrin molecule…
CF: Just as you were predicted to do.
SM: …since…at the age of 48, and Seymour predicted it. So is that spooky? Does that give you a little chill go up and down your spine?
CB: Yeah. Well you know….[…?] you could just go ahead and do that, you know?….I'll be right back. I wanted to get something.
SM: So anyway, but that's really …the secret of life, you know, is in these…they're very similar molecules at the nucleus, at the heart of the energy transfer, whether you're transferring oxygen as in hemoglobin, or you're transferring other things in chlorophyll. There you're doing the opposite direction. You're going into…you're taking in carbon dioxide and using energy from chlorophyll to create sugar. So..But again, all these caged molecules are the central process of our energy systems. And I think that's what Seymour is talking about when he talks about: did we come from a photosynthetic ancestor and switch from magnesium to iron and then build up this molecule. And I'm not enough of an evolutionary biochemist. Somewhere there exists a person who can really answer that question, but not me.
34:16
DS: In this context, the term chellation…
SM: chelation [key-lation]
DS: chelation?
SM: Chelation is the bind…the bond…noncovalent bond…Ah, it's been a long time guys. I'm not a biochemist. I don't use my biochemistry very much.
DS: Of a metal, right?
SM: Chelation is…is the.. is the binding of a metal to an organic molecule in such a way that it becomes soluble, and...
CB: You can replace it with metals of different properties, right?
NY: Yeah.

CB: You know you have a EDTA…
SM: The act of chelation: For example, if you developed an iron overdose by taking too many iron pills, you'd be given a molecule, called EDTA, which is a chelater, which…the job of which would be to grab these iron molecules and take it out of your body. So that's what chelating…It's called chelation therapy, actually.
CB: Yeah.
SM: And there is a form of chelation therapy that is a kind of quackery that is advertised [as?] cancer therapy, but it's not really chelation therapy. When they try to get plutonium out of a person, they try to use chelation.
CB: Oh yeah.
DS: Or mercury? Is it that also…
SM: Mercury doesn't…you think they chelate mercury?
CB: Well it depends on what order…
SM: Yeah, you're right.
CB: who replaces what.
SM: You're right. You have to send in a molecule that…where you can replace that atom with the other atom.
CB: So sodium […?] EDTA. So they replace the sodium in EDTA maybe with something? No? I don't know.
NY: Yeah. I don't think you can displace…mercury won't displace sodium.
CB: You can't displace, no?
DS: I have two more questions here I'd like to sort of raise.
CB: OK
DS: Was Hutner responsible for bringing Provasoli to the Lab?
CB: Yes
DS: How long did they collaborate and when did they form separate research groups?
CB: Well they started about 1946, and the story, let's see, is that Provasoli went to Andre Lwoff and…
DS: That was in Paris, right?
CB: Yeah. And so that's what I read. And then…So Lwoff recommended Seymour, because he had worked with Seymour. And that's …and Provasoli actually came to the Lab because of Andre Lwoff. And how he got to the Lab, you read that that
DS: Yeah
CB:…Seymour called him the.. War Bride
DS: War Bride
CB: Did you..I don't know…What happened was his wife, Rose Provasoli, she was an artist. She was working in Paris and I guess that's how he met her. But, they fell in love, but things being what they were, he had to be classified as a Nazi, because he was in in Mussolini's Italy. So they had to..
DS: He was a member of the forces too.
CB: Yes, he was. They were forced into it. You know, whatever. I don't know…
37:45
DS: Everybody had to be [if he was a scientist…?]
CB: Yeah…It wasn't any political persuasion that he wanted I'm sure. But what happened is a reverse of the War Bride thing where Provasoli and Rose got married.

And they had some sort of special act of Congress. I don't know; I guess it was common in those days where they tacked this..that…you know, you had some act of Congress, but that… the ending of it would be an addendum that Luigi Provasoli is now an Amer… considered a US citizen. Bec…But the thing was that Rose was the American citizen and Provasoli …
DS: Well Rose is no longer alive, is she?
CB: Oh no. She passed away…I'm not sure how...I don't know the numbers. After Luigi died. He died of prostate cancer, unfortunately. Had it for a long time.
DS: But that also prompts me to ask about Irma Pintner.
CB: I don't know.
SM: No, I never knew Irma.
CB: Hm?
SM: I never knew Irma.
CB: Oh I knew Irma. She was Provasoli's technician. And she took care… he had this like this whole collection of 2000 algal strains, and she took care of all of this. When they moved to New Haven, she went with him.
DS: She moved to New Haven.
CB: Yeah. And that's, I think that was the only person...because I remember I asked Alice Dadourian how Irma was, and she said: "Well, she's old and she's still here" and..
39:17
DS: Alice will know. Will probably, yeah.
CB: Yeah. You know what? She will know, Alice Dadourian. Yes. She was sort of…what? Caryl Haskins' secretary? I'm not sure.
CF: She was kind of office manager eventually. Yeah.
DS: I have one more thing here that I would like to…And this is more of a request than a question. We really want to compile a list of the Haskins bio researchers before the Pace era. And we need your help with that.
CB: Alright.
SM: When you say researchers, would they be like Art Zahalsky, and people like that?
CB: Herman Baker?
DS: Yeah. People who contributed to the…
CB: Well, I mean, you know, we have Stuart, Davy Kaback, all the people that worked under Seymour. I don't know…
SM: Oh! I know how you can tell who those people were: the Christmas cards.
CB: Yes, you go…Yes, but also, remember Seymour's birthday party? We had an 80th birthday party.
SM: And what happened?
CB: Josie has a file, a list of all of the people who came. We had a pretty big shindig for him for his 80th birthday.
SM: What year was that?
CB: Uh, 1911. So '82
SM: '91
CB: '91, sorry.
DS: We're just 22 years too late.

CB: Well, we put it together. You know. Here. And it was…
SM: Oh, I remember that.
CB: Sure you do.
SM: That was fun. Yeah. that was fun
CB: We had [Katty Kitakaro??] was there, Carlo Tamburro, I think Mel Belsky. All these people were...
SM: People came from all over. It was fun.
CB: That was some…Peter McCann was there. Recommended the wine.
SM: Yes, Yes! Yes, yes. That's right. Yes.
CB: So we can get that list.
DS: So Seymour was active in the lab until about when?
CB: I'm guessing about '98,
SM: I don't know.
CB: Right Nige? Because there was a point there at which we knew he had to retire. It was tough. But he was coming in.. Hi Donna. Donna! Donna! Donna, could you do a favor? This is Donna. Donna has fourteen, fifteen years worked with us, but with Seymour as his senior technician and all of that for a long…
Donna: [..?] No, about 10 years, less than 10 years. No, yeah… '92…About eight years. It was 2000, [1999 we converted ?]the room, the good room.
CB: Right, right. This room was Seymour's office.
Donna: […?] major event, that's when I got married. So…
CB: Alright. Alright, but she did a marvelous job in containing Seymour. Seriously. Do you have any of these, the 10 ml flasks? ? I just wanted to show them.
Do we have any of them in a tray, or in…?
NY: Yeah, We do, we kept most of those.
Donna: Yeah, we do. They're up in the top of the brown cabinet. Yeah, so if I get…I can get […?]
CB: Don't..
NY: Don't break anything.
CB: Yeah, don't…I just wanted to show you what we're talking about the way we did these experiments.
SM: Great. There we go.
CB: Small version of this thing. She did a lot. Donna did a lot with Seymour and she really cared for him and that was really nice. Glad she… Yeah we can do that. And I have to write a note to myself to get that list.