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Stephen R. Gliessman: Alfred E. Heller Professor of Agroecology, UC Santa Cruz

Permalink

<https://escholarship.org/uc/item/0q88w50t>

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Publication Date

2010-05-01

Supplemental Material

<https://escholarship.org/uc/item/0q88w50t#supplemental>

Stephen R. Gliessman

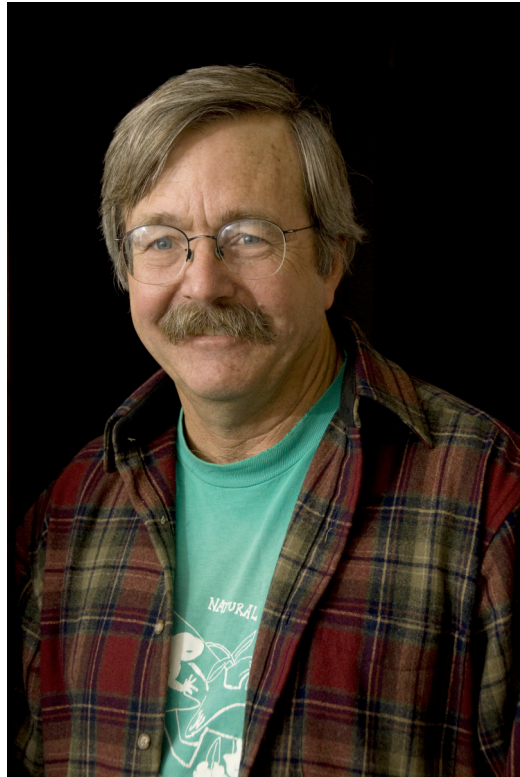


Photo by Jennifer McNulty

Alfred E. Heller Professor of Agroecology, UC Santa Cruz Founder, UCSC Agroecology Program

An internationally recognized leader in the field of agroecology, Stephen (Steve) Gliessman is the Alfred E. Heller Professor of Agroecology in UC Santa Cruz's Environmental Studies Department, where he has taught since 1981. He earned his doctorate in plant ecology at UC Santa Barbara, and was the founding director of the UCSC Agroecology Program (now the Center for Agroecology and Sustainable Food Systems). His teaching focuses on agroecology, sustainable agriculture, organic gardening, ethnobotany, California natural history, botany and ecology. He is the author of the

groundbreaking textbook *Agroecology: The Ecology of Sustainable Food Systems* (Second Edition, CRC 2006), and numerous other books and articles. In 2008, Gliessman became the chief editor of the internationally known *Journal of Sustainable Agriculture*.

Gliessman's activities in the field of sustainable agriculture are extensive. He founded and directs the Program in Community and Agroecology (PICA), an experiential living/learning program at UCSC. He heads UCSC's Agroecology Research Group, an interdisciplinary body of faculty, graduate, and undergraduate students, research associates, postdoctoral researchers, and international visitors from the agroecological community. In 2001, Steve and his wife Robbie Jaffe (also interviewed in this series) started the Community Agroecology Network (CAN). CAN's goal is to help a network of rural, primarily coffee-growing communities in Mexico and Central America develop self-sufficiency and sustainable growing practices. CAN markets coffee directly to individuals, institutions, and markets in the United States. Those who wander through the Downtown Santa Cruz Farmers' Market can sample and purchase CAN coffee at the market, UCSC students can drink it in campus dining halls and cafes, and everyone else can order the coffee and have it shipped to their home. CAN and PICA also co-sponsor the International Agroecology Short Course, which Gliessman has taught since 1999 in venues as diverse as Costa Rica, Mexico, and Vermont.

A consummate storyteller, Gliessman reflected on the diverse aspects of his life in agroecology in this comprehensive interview conducted by Irene Reti on three different occasions: April 16, May 25, and June 12, 2007, in his offices on the UCSC campus. Gliessman's office shelves are packed with books and journals, conference programs, buttons, posters, and other archival material representing forty years of reading and publishing in his field. He assured Reti that he "never throws anything away." He sometimes referred to these books during the interview; at one point he held up a packet of heirloom seeds from Brazil, at another a bottle of olive oil from his own organic orchard and vineyard, Condor's Hope Ranch in Santa Barbara County, California—a place close to his heart.

Additional Resources

Stephen R. Gliessman. *Agroecology: The Ecology of Sustainable Food Systems*, second edition (CRC Editions, 2006)

Selected List of Gliessman's Publications: http://www.agroecology.org/Steve_Pubs.html

The UCSC Agroecology Research Group's excellent website on agroecology: <http://www.agroecology.org/>

UC Santa Cruz's Program in Community and Agroecology (PICA): <http://ucscpica.org/>

Community Agroecology Network (CAN): <http://www.canunite.org/>

The Vivid Picture Project: <http://www.vividpicture.net/>

Condor's Hope Winery: <http://www.condorshope.com/>

Reti: This is Irene Reti and it's April 16, 2007. I'm here with Steve Gliessman in his office at Natural Science II [at UCSC]. Steve, today let's start by talking about where you were born and where you grew up.

Early Influences

Gliessman: Well, I was born in San Francisco. My father was going to pharmacy school at UC San Francisco on the GI bill, right at the end of the Second World War. So that's where I was born, while he was still going to school. But we only lived in San Francisco—I was, I guess, thirteen months old when we moved from there back to Reno, Nevada, where [my father] was from. He finished pharmacy school and went to work for his uncle, my great uncle, who had a pharmacy right in downtown Reno. I know my dad; he went into pharmacy only because he kind of had to. During training for the Second World War, he was training to be a ski trooper, like all of his friends from Reno. They were all skiers, and that was the thing that drew them into the war. And in training, or on a

break, I guess, one day he was driving a motorcycle and got hit broadside and lost a leg.

Reti: Oh, my God.

Gliessman: So he was no longer able to be in training. In some ways that was a good thing, because most of the guys who went over pushed out of airplanes over the Alps someplace, and who knows how many of them ever made it back. He was an active outdoors person, so this was a big change in his life, and his uncle's pharmacy in Reno became the other alternative. So he went that way.

We lived in Reno until I was about seven. I guess at that point my dad figured out that the only way his uncle was ever going to leave the business was feet first. My dad originally had thoughts of taking it over from my uncle and turning it into his own business. But it didn't look like that was ever going to happen. Or if it was, it wasn't going to be an easy thing to wait for, because my uncle was not an easy person to work for.

So we decided to head off back to California. We moved to Sacramento in 1954, I think. And moved just south of the city, in the suburbs of what is basically downtown Sacramento, in one of the first tract homes that began that explosion following the Second World War into the early 1950s, when things really started to grow in California.

Reti: That was a historic moment in the Central Valley.

Gliessman: It really was. Our little tract was located right in the middle of farmland. For a little kid, that was a great place to be. I could wander all over the

place, and go out in farm fields and old barns and all kinds of stuff, where people had either sold out or left, and they were beginning to build houses.

[When we were still in Reno, my] dad was working seven days a week, practically, at the pharmacy, at the drugstore. For the summers, my mom would pack up and take me and my sister (she is three years younger than I and was born in Reno), and we'd hop on the train at the beginning of the summer and go down to Sacramento, over the Donner Summit. We'd change trains in Sacramento and take one south down to the Central Valley. We'd get about to Merced, maybe a little further, and the train line would stop. My aunt and uncle (on my mom's side) would pick us up. She was from Delano, just thirty miles north of Bakersfield there in the Central Valley. We'd then end up spending the whole summer living with my aunt and uncle there.

Reti: Were they farmers?

Gliessman: No. Well, there was quite a bit of farming going on in the family, on my mom's side. My grandfather, my mom's dad, and his three brothers had come to California right at the end of the 1800s, early 1900s. And as the story goes as I always heard it, they were part of the oil boom of that region. It was concentrated more down towards Bakersfield and over towards Taft and Shafter and those areas. They were just a little north of that, out doing some exploratory drilling, and they kept hitting water instead of oil. And I don't know, I guess my granddad got the idea of, well, geez, let's go into the business and drill water wells. So they started a company, Whitten Brothers Pumps, that is still a family business. One of my first cousins heads it up now. It is in its third generation. It

was for a while one of the biggest well-drilling outfits between Bakersfield and Fresno. (Wasn't much in between the two, I guess, for a long time.) (laughs) They drilled wells for farmers. One of my cousins there *was* a farmer on the west side of the San Joaquin Valley, thirty miles west of Delano, out there in that time just awful country, before the California Water Project. The only way you made it in agriculture was with wells.

Reti: Awful country in the sense of being really dry?

Gliessman: Mmm. Very dry. And the quality of water, a lot of times, from the wells wasn't all that good. One of my main activities during that time was to ride along with my uncle, my grandfather's brother. My grandfather ran the business. He did all of the promotion and development and all that, whereas the uncles, his brothers, did all the hard work of going out and servicing the wells and drilling them and all that. I'd always go along with my uncle. We'd leave before daybreak, and box a lunch, and get in his old truck, and off we'd go to service a well at some place in the San Joaquin Valley (laughter) in the middle of the summer.

Reti: Whoa!

Gliessman: For four or five summers in a row that's what I did. I loved it out there wandering around these farms while my uncle was working on the wells, getting into trouble, all that kind of stuff, but having a good time.

Reti: What kinds of crops were being grown down there?

Gliessman: In those days out on the west side it was cotton, largely, and a few other irrigated crops in rotation with cotton. That's mostly what it was. They were trying to raise animals as well, usually had stock, pigs, cows, a few other things. They were 160-acre or 80-acre pieces. They were all sections. They weren't much bigger than that, because that's what you farmed. It was before things started to consolidate like they are now. It was all mostly family operations—hardscrabble, poor, but trying to make a go of it. We'd go out to my cousin's place. It wasn't just to service the well. My uncle would also run the irrigation. So I'd be out there slopping through the mud along with him, and running the water around on the fields, as they were mostly in those days using flood irrigation, not so much furrow irrigation.

And then a lot of times I'd just stay in town in Delano and wander around doing things. (laughs) In that period of time is when they were building Highway 99. There was just a two-lane road connecting the towns before that. And this is when they first put in a four-lane highway with an *overpass*. Boy, we just thought that was the coolest thing! Here I am six, seven, crawling around in the tunnels and stuff while they are digging this, putting this stuff in. It was new to us at that time, that kind of technology.

Reti: (laughs) It's just amazing.

Gliessman: Yes. But I also remember— In the heat of the day in late July or early August in the San Joaquin Valley, or pushing into September, before we'd go back to Reno for the school year, I'd just be really hot. Usually the best place to cool off were in some of the irrigation ditches, either by myself or with a couple

of other kids that I got to be friends with while I was there. We'd do that. The other big thing to do was to go down and hang out under the grape vines. In the central part of the valley they were really starting to get into Thompson Seedless grapes for raisins. We'd go hang out underneath those when they were ripe, and just eat them off the vine. Of course, in those days they were being sprayed fairly heavily. We didn't really know much about the effects of pesticides in those days. I also remember a thing that was a lot of fun to do was to go down to the end of the field when a crop duster was coming down and just getting ready to lift up, and get doused by the spray.

Reti: Oh, Steve! That's terrible.

Gliessman: We didn't know. (laughs) We thought that was the greatest thing going, as kids.

Reti: Of course not. I remember seeing them fly when I was a kid, and thinking it was kind of cool when we used to go through the Central Valley on vacation.

Gliessman: Oh, yes. Gosh, it was something. But I was always out wandering. Another uncle on my grandmother's side, they had a dog, a big old German Shepherd named Rusty. For some reason or another, we connected. He wandered around with me everywhere I went. I'd say goodbye to him in September and come back the next June and he'd remember me. I did that for many years. My wandering buddy.

But after we moved to Sacramento, just up the highway (which was done by that time), we stopped going down to my aunt and uncle's place for summers. We

only lived in Sacramento for a couple of years. That housing tract that was going in had a little tiny shopping center associated with it—a grocery store and a drugstore, a barber shop and a couple of other things. My dad moved in and became the first pharmacist running that little drugstore. I don't remember exactly why, but after about two years, maybe it was the hot summers, or maybe the business, the whole idea of a shopping center, people weren't quite used to it yet. The housing tract was a little slow to get going. People started moving in slowly. So financially, my dad was struggling. And before he got too deep in debt, I guess, he started looking around for something else. That's when he found out about a job in Santa Barbara at a medical clinic that was owned by doctors. In those days the doctors could own the pharmacy associated with their medical clinic. They needed a pharmacist. Some way or another, my dad found out about it. He went over there, and in 1956 we moved to Santa Barbara, where I lived from fifth grade through graduate school, all in Santa Barbara.

We moved into downtown Santa Barbara to start with, practically, and then just a couple of years later moved out onto the outskirts of Santa Barbara, where again housing tracts were starting to develop in agricultural land. So we essentially lived surrounded by old farms, many of them still functioning in those days. I remember an egg ranch practically right next door, and avocado trees and lemon trees and all the kind of stuff you see (or saw, I should say) along that coastal strip in those early days.

Almost right away I got into a boys' group. It was kind of like a Boy Scout group, but it was part of a church there in town. They took us back into the backcountry and I started camping and fishing. Then I hooked up with some kids in high

school and got into hunting for a little while. But also lots of time in the backcountry, outdoors and into that San Rafael Wilderness Area, which was pretty neat country, and it still is.

Shortly after I got to Santa Barbara, my dad was running the business and keeping pretty busy, and we didn't have a lot of money at that time. He was working as a salaried pharmacist for the doctors, and Santa Barbara even in those days was a little bit expensive to live in. I needed some pocket money. So here I was at eleven years or twelve years old, and I started landscaping. I'd go mow the neighbors' lawn and weed. For some reason I was into plants practically right from the start there. My dad, without his one leg—he had a prosthetic and all, but there were a lot of things he couldn't do. I tried to take over and do the things he couldn't do as far as physical work outside was concerned. I tried to do my best. So I kind of took over the landscaping of our own yard. I guess my mom or my dad would tell me how to do it, or I figured it out, or I just did it, I don't know. But here I was. To the point where, (laughter) I remember this, and my mom brings it up occasionally, where I figured we needed some topsoil for planting a little slope in the backyard. I'd asked my mom and dad, "Wouldn't it be a good idea if we could get some dirt?" They said, "Sure." But they didn't think anything of it. So what did I do? I get the phone book out and I find in there: "Dirt, Order Soil." So I get on the phone and I ordered a big dump truck load of dirt without telling my parents.

Reti: Whoa! (laughter) Full of dirt.

Gliessman: So this truck shows up, knocks on the door, “Ma’am, is this where I’m supposed to deliver the dirt?” She said, “What? We didn’t order any. Who ordered dirt?” I sort of said, “I did.” By that time they couldn’t send it back, so I ended up with a load of dirt.

Reti: Wow! (laughter) That’s some chutzpah.

Gliessman: I had fun spreading it around. Anyway, I did that kind of stuff. I started doing a lot of gardening at that age, and made it a little business, almost. It gave me some pocket money instead of a weekly allowance.

Reti: You made it yourself.

Gliessman: Yes. And I stayed in Santa Barbara, and went to elementary, junior high, high school. In high school I got into track and cross-country and did quite a bit of running on the school team. Then when it came time to graduate from high school, I decided to (well, I couldn’t afford to go anywhere else), I applied to UC Santa Barbara.

Reti: It was a pretty new school then.

Gliessman: It was fairly new, yes. I got in there, and I guess I had this idea I was going to be a marine biologist. I don’t know where I got that idea. I know I did in high school take a marine biology class. I don’t remember much about it. In fact, I don’t hardly remember *anything* about it. I remember the teacher’s name, Mr. Lopez, a short guy. But I don’t remember much else. (laughter) It must not have struck me very much.

But since UC Santa Barbara was right there and had a marine biology program already at that time, it just seemed like the thing to do. I liked the beach, and I always had dreams of trying to go across to Santa Cruz Island, which we could see out there all the time and never got to go to because it was private. I remember when they built this boat, a cattle boat, in a shipyard that was right along what was, at that time when we first moved to Santa Barbara, a two-lane highway. That was Highway 101, running down along the edge of town, and this shipyard right there. They built this great big cattle boat about a half mile from the ocean. I remember watching that thing go together. Ultimately it was finished and they trailered it down to the ocean. It was used mostly by the Santa Rosa Island ranch.

Reti: Oh, to bring cows out to the island.

Gliessman: Mostly to bring cattle back. But it also carried cattle from Santa Cruz Island. That was the main thing they were doing, raising cattle for sale on the mainland. So that was always intriguing, too. I remember that boat. It looked like Noah's ark, funniest looking thing.

Reti: (laughter) An ark of cows.

Gliessman: Yes. (laughs) I wonder if it's still floating anywhere? Anyway, that's something I remember.

UC Santa Barbara

So I went to UC Santa Barbara, and the first year I struggled with grades. I don't know what it was, the change from high school to college, and I was still living at

home and it was hard to study. I struggled a lot with the basic introductory biology courses. Calculus and physics and all those things really threw me for a loop. I remember going to summer school in between my freshman and sophomore year because I didn't have a 2.0 by the end of my first year, and I needed to make up some grades. I took an art history course and a political science course in the summer. My mom's an artist. She'd gone back to UC Santa Barbara and finished her undergraduate degree. This is while I'm finishing high school and getting ready to go to college; she was in her undergraduate year, I think the first year after I started college. Then she went into the MFA program in art there, got her Master's of Fine Arts, finished that about the same time I finished my undergraduate degree. Art was always around us in the family because of her work and her interests, and for some reason or another, the art history class I got into. It was fun learning who painted what. I could remember it and ended up getting an A in the class.

I think I got a B in the political science class even though I couldn't stand the teacher. At that time politically I was kind of conservative, I don't know why. I guess it was because of that independent streak. In those days: damn government, you don't need it, or whatever. I didn't even know if I knew what I was doing at first. But by the time I got into college, what was that, 1964? Things were just starting to get going up at Berkeley. Some of that stuff was just beginning to happen. I was sort of not on that side. I guess I'd rather have been up in the mountains taking care of myself. Probably had dreams of being a survivalist or something at one time, I don't know. (laughs) The first time I could

vote was 1968. I think Ronald Reagan was running for governor. And of course I voted for him.

Reti: Aha! (laughter)

Gliessman: (laughs) Interesting, huh?

But after I got enough grade points to get my average up to a 2.0 and stay in school, that very next year I went back and I took a botany class, Plants of California, from a guy named Bob Haller. It turned my life around, academically. I fell in love with the class, the plants, learning them, their scientific names. Maybe it's because when I was in junior high— Oh, gosh, I should back up. I keep leaving all these little details out. But I remember going into fifth grade, how big a deal it was when we went out on the back porch at night and watched the reflection of the Sputnik. That was '56, I'm pretty sure.

Reti: The reflection of it?

Gliessman: Well, you could see the sun glinting off of it. It looked like a star. You could see it moving across the sky. We thought that was the biggest deal. We would go out there and watch it. We'd go read the paper and find out when it was supposed to be over, and go out there with binoculars and see this little speck move across the sky. I think that turned our educational system upside down, because, here the Russians had beat us to space. Boy, they just went into high gear in terms of trying to catch up, and created all these tracking programs. And I got stuck in one, coming out of the sixth grade, because I guess my scores were high or something, and I got put into an accelerated program in junior high

where I took Latin for three years, and accelerated science classes, all that kind of stuff.

Reti: Okay. So you already had the science background.

Gliessman: Yes. That was where I was tracked. But by the time I got to high school, I know I was— Well, I shifted over to German for three years there, in language, and then started getting into algebra and geometry and calculus. That's where things started to slow down a bit. I wasn't enjoying that, or even understanding it that well. I struggled with the math part. But all the while I was doing running, and enjoyed that. I hooked up with a little group of local kids and we always would go into the backcountry. We started hunting together for deer and birds and stuff like that in the backcountry, in the mountains over behind Santa Barbara. So I was out all the time. The kids I was doing that with, none of them were academically inclined. They were all outdoors kids, and almost nobody did that. Because that was also, I remember, the time when surfing began.

Reti: The early sixties.

Gliessman: Late fifties, early sixties. Most of the kids would go hang out on the beach.

Reti: And you'd want to go hike in the hot backcountry.

Gliessman: We'd go turn around and go in the backcountry, this little group of us. There weren't that many of us that did it at that time. So I never surfed, even

though I was from Santa Barbara. To this day I haven't surfed. I just don't like cold water.

Reti: (laughter) I can relate.

Gliessman: I was in the backcountry all the time, in nature. I could read the hillside; I could tell where there would be deer; I could tell if it had been burned. I learned at an early age to read the landscape, for different reasons. And when I got into that botany class, I had a foundation. I had been trained on the Latin names, almost. It seemed like I could take the Latin names of plants apart into their roots, and it would make sense to me, and I could remember them when I can't even remember my own phone number. (Numbers will not stay in my head but Latin names will. It's crazy, but that's how it is.)

When I took this class, apart from being able to connect to the names, the other piece, of course, was it was all field trips. So we got to go out. Bob would take us on three-day field trips. We'd leave early Friday morning early and miss school that day and drive 1500 miles over the weekend, as we'd go out to the Mojave Desert and all over the place, stopping every few miles because he'd scouted the trip the weekend before, and collecting plants and keying them, and pressing them, and doing all the stuff you do. I just loved it.

Reti: It sounds like an early Natural History Field Quarter experience.¹

Gliessman: Yes. Then I got a job in the herbarium at UC Santa Barbara by the end of my sophomore year. I really did well in the class. All of a sudden, my grades turned around. From barely passing, I started getting A's. And while I

was working in the herbarium and taking botany classes, at that time UC Santa Barbara, or the biology department, had an incredible ecology program. Upper division. There were probably at least eight or ten undergraduate field ecology courses in plants.

Reti: Really? This early, before Earth Day?

Gliessman: It was amazing. Oh, yes. It was an amazing program. Bob Haller was part of it. But the person on the plant side who really pushed it was Cornelius [Herman] Muller, C.H. Muller, a plant ecologist. I took a couple of his courses, and I really liked it. Again, drawn by the field trips, but also drawn by this focus on reading nature that seemed second nature to me. I loved doing it, and could do it easily and felt connected to it all. It meant something, in terms of being able to understand how nature works. After working in the herbarium for a year, [Muller] asked me if I'd like to come into his lab and work with some of the graduate students who were doing research in allelopathy, the chemicals being released by plants, at a time when allelopathy was just being discussed, researched, proposed as an important factor in ecological process.² The lab in the U.S. that was doing most of that work was C.H.'s lab. In 1966 he had a photograph on the cover of *Science* magazine that focused on the research he was doing in the chaparral, and calling attention to allelopathy.

So I worked as a lab assistant for a couple of those graduate students. It involved a lot of in-the-laboratory-time washing petri dishes and that kind of stuff. But I also got to go to the field with them and sample, run transects, and do all that good stuff. Try and figure out: why is this here and that's not? That piece started

to get me—to really draw me in to try and figure out why something was doing what it was in nature; what were the factors in interaction. That was a piece of my real upbringing. I liked it a lot, and did a lot of it, all the courses I could while I was there.

As a senior, I began thinking, well, where am I going to go next? I continued to take courses from Bob Haller, the botanist, but I took them from C.H. in ecology, and another guy in plant physiology (Wally Muller), and another one in plant systematics (Dale Smith), and another one in plant anatomy and morphology (Maynard Moseley). There were all these wonderful courses. I loved them, and I did really well in them.

I remember taking a course in plant geography from Bob Haller. It was actually a seminar course. There were mostly grad students in it. Most of the grad students were the folks I was working with as a work-study assistant. So I knew them. They kind of put up with me. I was just this lowly undergraduate. Bob taught this course on the biogeography of tropical islands, or just islands in general, and got into this whole idea that islands are pretty special. The isolation has allowed evolution to select for some pretty fascinating things. So when we started this seminar, we were asked, each of us, to choose an island someplace in the world and research it and present a seminar on what you'd found. Well, for some reason or another I chose New Caledonia. As I read about it, I got really interested: tropical, kind of exotic, far away, unusual. I started thinking, boy, I'd like to go to the tropics. That sounds really cool.

And of course, up to that time, where'd I been? Well, Reno. And maybe a little further out into Nevada with my dad. One spring just after we'd first moved to Santa Barbara we rented a little eight-foot house trailer. My brother had just been born that year. So all five us, with a 1955 Pontiac Coup with this little eight-foot trailer, off we went to Arizona for Easter. It happened to be one of those Easters where the wildflowers were in good shape, and it was beautiful. I just have vague sort of recollections of color and greenery, and how nice it was out in the desert. We took a week and did that. So that had been the extent of my journeys. And up and down the coast of California a little bit, and over to the Central Valley. I'd never been anywhere else.

Here I was, reading about New Caledonia. I thought, whoa, that sounds really neat. I'd like to go to the tropics. In fact, I'd like to study the ecology of the tropics. I was beginning to get drawn to it. So I went in to C.H. I was a senior. I guess it was after the fall quarter, beginning of winter quarter, about the time we start thinking about grad school. I guess I was drawn in that direction and I thought, gosh, I'll go to grad school after I finish here. So I went in to C.H. and I said, "I want to study somewhere where I can study the tropics and go to the tropics. Where would you recommend I go?"

Well, C.H. sort of leans back in his chair like he always would: quiet, kind of slow. He was actually a Texan with German heritage, but he'd spent a lot of time in Mexico. He was kind of quiet, but very direct. He looked at me and he said, "You don't have to go anywhere else. You can do it here." I said, "Well, how do you do that?" And he says, "Well—" Because he'd been watching me. I'd started a senior project in his lab, or at least I was thinking about it. I was doing really

well. The grad students liked working with me. They really could count on me to do good work. So when we got a chance to do a project in this plant ecology course I was doing with him, after I'd asked him this question about the tropics he said, "Well, you can do it here." I didn't know what he was talking about. I couldn't figure out how you could do it here. Santa Barbara wasn't the tropics. Then he said, "You know, there's a plant up on San Marcos Pass." He described the place. I said I knew exactly where it was because it was right next door to where a couple of my old high school buddies lived. I used to go up there and go camping and hunting with them. He said, "It's a fern. And it's doing things that most ferns don't do. I don't know anything about it. I just saw this pattern, a stand of this fern where it didn't look like a fern should be." That's all he told me. He gave me directions. He said, "I haven't been up there for years. I don't know if you can still find it." He goes on and on.

Reti: (laughter)

Gliessman: So off I go. Found it right away. And here's this stand of this fern: bracken, *Pteridium aquilinum*. I'd probably collected it and identified in one of my previous botany classes. So I immediately, since I'd been working in his lab and doing allelopathy, said, well, I bet it forms a stand like this because it's allelopathic. So I sampled some plant material and I took it back and I used the same bioassays, techniques that I'd learned as a student in the lab. And boy, sure enough, that stuff was as toxic as could be. I got all excited and went running back to C.H. and showed him the results. He said, "That's really something! You should continue to look at this in more detail." So for the next quarter, that became my senior thesis project as I researched the literature, found out that

bracken is a dominant plant in a lot of places in the world. It's a weed. It's a problem. It's hard to get rid of. It inhibits the growth of others. But nobody had ever looked at allelopathy. Nobody even imagined that a fern could do it. So I got to really dive in, and show preliminarily what you can do at the senior thesis level, that it's got the potential of doing that.

Reti: That's remarkable.

Gliessman: When I showed him those results and asked him for a letter for applying to grad school, he said, "Well, why don't you just stay here and go to grad school and keep working on this fern thing and unravel it." I said, "Well, I still want to do the tropics." He said, "Well, they just started this new program down in Costa Rica called the Organization for Tropical Studies. And a couple of people, the founding faculty advisors on it, are folks I know, Mildred Mathias down at UCLA and Herbert Baker at UC Berkeley." Very well-known botanists. They were friends of his. I thought, hmm. Well, why not? Because I was having fun with the bracken stuff, and to be able to really keep going on it—

My overall GPA, when you added in the first year and a half or so of my studies to what I did later, was only a 2.74 on a four-point scale, which wasn't enough to get accepted. But I had almost a 4.0 in all the upper-division courses I'd taken once I'd gotten into botany and ecology. C.H. told the selection committee that he didn't care about the grades. He wanted me to be in his lab. He stuck his neck out and took me. So I got into grad school, and that very next summer applied to OTS [Organization for Tropical Studies] and got accepted in 1969 to go down to Costa Rica and take the two-month tropical biology field course. I loved the

course. But I remember, we were driving across a mountain in Costa Rica going from one field station to another, and what did I find alongside of the road?

Reti: Bracken?

Gliessman: Bracken. He knew it was down there, but he never told me. I had to find it for myself. I went back down there a year later and did research on it, and followed it up to Oregon and Washington and did research on it, and ended up doing a study that looked at allelopathy in a single species across a really broad geographic range, which was kind of unusual at that time, and how the mechanism of release and inhibition was different depending upon the environment, where the plant occurred. There had been selection for different mechanisms. Great fun, to figure all that out.

Reti: Is that the same bracken we have here on campus?

Gliessman: Yes, it is. The way bracken works here is different than down in Santa Barbara, because the pattern of rainfall is different. It was really fun to figure all that out.

But two things were kind of going on during all this. One, of course, I got into grad school in '68. And '69 was the beginning of the lottery for the draft for Vietnam.

Reti: Oh. (sigh)

Gliessman: It was also the time when they'd finally done away with graduate school deferments. They had done away with deferments for married people,

and I had just gotten married. I got married to my first wife in September of 1968, right at the beginning of my grad school, right out of my undergrad, going into grad school. But that didn't keep me out of the army. And I remember halfway into my— I guess just over 1968 into 1969 they did the first lottery and I got number twenty-one out of 365, which meant—

Reti: Ay.

Gliessman: Yes. And sure enough, about three weeks later I got my draft papers saying, you will report on such-and-such date to such-and-such place for this, that and the other, and be inducted. And I— I didn't want to go, although I was still— It had been an interesting year. We had had student protests on our campus at Santa Barbara. The Black Student Union, or something or another, had done some major protests on the campus. Things were starting to heat up as far as student protest of the [Vietnam] War was concerned. I was sort of caught, in a way. My wife, Nanette, at that time was fairly progressive, liberal, and was against the war. And here I had all these friends who were going over there from high school, who were being killed and not coming back. So I felt almost obligated to do it. But I had gotten into grad school. I got my research going. I felt like—here I was married, all this kind of stuff. I really didn't want to [go].

I go to my major professor and tell him, "I got my draft papers. I'm going to have to stop doing grad school." He said, "Well, wait a minute." Little did I know that his neighbor over the back fence of his place was also the general of our local National Guard unit. He goes and talks to him. And the general says, "Tell him to take his draft papers and go down to the National Guard unit, and we'll take

care of it.” At a time when the National Guard wasn’t taking too many people because they didn’t want to pull away from the draft process, my papers were changed.

The Organization for Tropical Studies in Costa Rica

Oh, I had also applied for the course in Costa Rica for that following summer. So I had to go before my draft board and appeal an extension so I could go to Costa Rica, say it was important for my career and all this kind of stuff. They granted me a four-month extension. This is while I still had my draft papers in hand, hadn’t gotten this other thing taken care of yet. And I was able to go to Costa Rica that first time.

The group of the people in the course were by and large fairly progressive environmentalists of that late sixties time—wondering about what was going on with nature, why are forests being cut down? There was a lot of discussion going on. A lot of it was just: gosh, the tropics are just an incredible place. There is all this diversity. Why is it that way? Why is it so different from temperate regions? We were drawn into all those discussions.

I took a quarter of Spanish before I went, when I found out I’d gotten accepted. I just wanted to have some language, for some reason, although the course was just a group of gringos together and you were pretty isolated and you didn’t even need to speak a word of Spanish. But I did it anyway. I guess because of my Latin, Spanish wasn’t all that unusual to me. I understood conjugating verbs and sentence structure and all that. It was completely the same, almost.

So when I went down there, I almost immediately started hanging out with the Costa Rican driver, the cook, the field assistants, who were fluent in Spanish, of course (they were Costa Ricans), and began using Spanish. I was learning words right and left. Sure, I was doing all the readings and the lectures, and the field problems, but I was hanging out with these folks, and got to be good friends with these folks. By the end of the time I was down there I could pretty much carry on a conversation in Spanish, enough to get by. It was great fun.

I also remember, it was towards the end of the course. I think it was July twenty-first, 1969. I'd hiked down into this canyon behind the field station, the Las Cruces Field Station, a fairly new station at that time, that OTS was affiliated with. I'd come out of the forest into a clearing where a farmer had set up, and he had his little corn planting on one side, and his pigs were in a little pen, and he was cutting up sugar cane, pieces for them to eat on. I walked over, and I think I said, "*Buenas tardes,*" or something like that. He looked over at me, and he could obviously recognize I was a gringo. He says, "*Hombre a la luna!*" I said, "What?" He says, "*A la luna. Un hombre!*" That morning we'd landed on the moon.

Reti: Man on the Moon.

Gliessman: (laughter) I didn't even know about it. What an experience, to have a farmer, with his little battery-operated radio probably going in his shack, know about this event before I did. That was interesting to think about. Yes, it was something.

I really connected to the tropics, learned so much, just drawn to it. But also connected to the people who lived there in the tropics. Not just the forest, but the

people next to the forest who were trying to make a living in a place that was forest. I was struck by it quite a bit.

About a year later, Bob Haller and C.H. Muller, both of them, put some funding together to send me back down. I'd picked up an old used Land Rover, so my wife and I drove from California down to Costa Rica.

Reti: Wow! That's a long way.

Gliessman: Yes, took us eleven days, I think. We ended up spending three or four weeks in Costa Rica doing a project on bracken. Found a place in the central part of the country where a mixed tropical evergreen-oak forest had been cut down—a lot of it turned into charcoal, sometimes planted in crops, a little bit of coffee—but a lot of it just turned over to pasture, degraded. Bracken was moving in, and taking over, and not letting the forest come back. I worked on the mechanisms of that, did some field sampling. We stayed in a little two-room hotel upstairs in a little place called Santa Maria de Dota, a little tiny town square. I'd go down the stairs and through the kitchen and out back where there was one faucet with some water, and I'd wash things out and then go back upstairs. People would wonder, "What the heck is he doing?" Doing little bioassays, doing a research project there.

Part of it was funded by C.H. because he'd spent time in Costa Rica. He was a plant ecologist but he was also a taxonomist, and he had become the world's expert on the oaks of Central America and Mexico and also in the U.S. For a good period of time he, more than anybody else, could distinguish oak species. Oaks are a mess because they are always hybridizing. Rarely do you find a pure line.

You find bits and pieces of other lines in the oaks. They're a taxonomic mess. He, more than anybody else, knew how to figure all that out. And one of the times he'd been down in Costa Rica, he'd seen an oak in this area. He'd remembered seeing it as pure stands, single species (and in the tropics that's kind of unusual), and no understory, leaf litter, nothing else. So he thought back to that and sent me down there to find it and to do some allelopathic work on it. It, sure enough, turned out to show that pattern. We composed a little paper on that together.

So that's what got me down there. But I remember, after almost two, three weeks in the community— Driving out of the community you look down into a little valley and a little town down at the bottom with a town square. Everything from forest to pasture is around. I'd been struck while I was there about how weird it was that here I was studying ecology, about what makes nature work, and all I was seeing was the destruction of forests. I was seeing farmers do things that were causing them to have to abandon the land and move on and cut more forest down. It didn't make any sense. It seemed like ecology should be able to help. I mean, we work with soil, plants, animals. It's about what makes nature work, what allows systems to recover from disturbance, and here were these farmers doing everything wrong, at least it seemed like that's what was going on. I didn't know much at that time but that's just what struck me. I would think, "Gosh, there's got to be something I can do."

Reti: Because you hadn't studied agriculture at this point. You were purely doing plant ecology?

Gliessman: Right. But seeing more and more of the impacts of humans on those systems, one begins to wonder: well, why doesn't agriculture use this as well? It didn't make sense to me. Probably if I had been trained in agriculture, I would have never thought that way. I would have thought, well, what's the technology we can use to fix it. I was studying ecology.

But— Oh, gosh there are a couple of overlapping things. Before we went down to Santa Maria de Dota, we spent two weeks up in Monteverde, a Quaker community that had homesteaded there in the early 1950s, way back up in the northwestern part of the country. I had heard that in some of their pastures they were having trouble with bracken. So we went and stayed there a couple of weeks. I remember how much I loved the community. I even really thought, gosh, it would be fun to become a part of it; I could farm. I guess the potential, the possibility was there.

The National Guard

But that was— Because, see, when I got back from Costa Rica in 1969 after I'd taken the course, then I got my draft papers, and got it worked out so I could go to the National Guard. Well, January 2, 1970, I showed up at Fort Ord for basic training. I had to. Everybody, the Guard, regular Army, everybody went together for their basic training; it was supposed to be up to six months. The first two months was intensive, basic boot camp. Our unit was an unusual unit because it was almost ninety percent Guardsmen, whereas all the other training units around us, and that other ten or twenty percent of guys who were mixed with us, I remember them as being eighteen, nineteen-year-olds. Here I am, old

man, twenty-four. And they were, a lot of them, fresh off the farms from, you name it, Tennessee, Iowa, wherever it was. In two months, or four months at the most, they were going over to Vietnam, and most of them not coming back. I was going home.

It was quite an experience, those four months at Fort Ord. The two months of boot camp, gosh, I remember, it was hard. But you coped, and you did what you—I guess, my nature, I tried to do my best in the physical part, in the riflery, in the—you name it. They do tests and see how you do, and I ended up being almost the highest in my unit in all of those categories, and even was nominated as our division's representative for something called an American Honor Medal, as a model trainee in boot camp, and had to go before a board of officers and answer questions. Well, I didn't get it. And the biggest reason was that in February of 1970 the Bank of America in Isla Vista was burned in a protest against the Vietnam War and most of my friends were in the midst of all that. And before I'd gone in, between my Costa Rica experience in '69, getting drafted, getting out and seeing friends not come back, I was really starting to change. It just didn't seem right. And the experience at Fort Ord, again, that didn't seem right. The group of us in that division, all Guardspeople going home, most of them very against the war, got drawn into that whole thing. It didn't make sense. It didn't make sense at all.

I got out of the two months of basic training, and then I went off to what they call OJT, on the job training in whatever your specialty is going to be. Of course, I got sent off to clerk school because I was a university student. At that time they had sort of a self-paced course. You could take four months to finish it, or you could

speed up and be done. After five weeks I was finished. But you had to put in at least two months. They couldn't release me. So I got sent off to one of the training units. They put me in as an assistant to a supply sergeant in the supply room in the basement of this three-story training unit.

Reti: And where was this?

Gliessman: Fort Ord. Yes, I know which building it is still. They haven't torn it down yet. (laughs) What an experience *that* was. The supply sergeant had a little business on the side. You wonder how all that stuff gets into Army surplus stores?

Reti: Oh! (laughter)

Gliessman: Anyway, he knew I knew it, and he knew I knew he knew it. But we had this agreement that I wouldn't say anything. Meanwhile, the place was a mess. Everything was disorganized; nothing was cleaned up. So I just started to do all that. In a period of just a few weeks I had that supply room tip-top from front to back. He started winning inspections and got all kinds of recognition and all this kind of stuff, and kept doing his little business, too.

What would happen, it was typical when you were a trainee in one of the trainee units in boot camp, you were harassed by everybody. You just were. That's just— It's sort of this thing you do. You're not nice to anybody; you harass everybody. And I guess when somebody was sick, or couldn't go out that day, they'd send them down to the supply room to do something. They were scared kids, tired, sick. I'd just put them doing some little thing. I'd say, "Okay, you take

care of this, and if somebody comes I'll tell you, but you can rest." I'd treat them nicely. (laughter) It was a funny little arrangement where they'd come and do their time and then sleep for a few hours and nobody would yell at them.

Reti: A refuge.

Gliessman: It was sort of a different situation. Meanwhile, I brought my truck up from Santa Barbara and we'd be loading up some of the extra stuff that the supply sergeant had been bagging here and there and shared it with my friends in Santa Barbara.

Reti: (laughter)

Gliessman: When I finally did get released and went back to Santa Barbara, the protests were still going hot and heavy, and Kent State happened. More protests happened. For the next year I never answered the phone because it might be the unit calling us up. I'd have somebody else answer the phone. "No, I'm not there. I'm in the field." Then I would wait a while to call back, and by that time it would blow over. They tried sending our unit out to UCSB a couple of times in a couple of the protests, and too many of us went to school there and we knew everybody, and we just didn't follow orders very well. So they'd call us up and they'd put us at reserve down at the Armory. They would never send us out. We were always sort of back-up.

Teaching the OTS Course

Anyway, through all that I got radicalized. That politically happened on one side. And then in 1972 (and I'm still in the Guard, and I'm going to my monthly

meetings and summer camp), I was invited to come back down to Costa Rica and teach in one of the OTS courses, the course I had taken in 1969, even though I was still not finished with my graduate work; I was probably six months away or something like that. I accepted it, but by this time having thought a lot about what does ecology mean for solving problems, and Earth Day had happened. At first I was sort of turned off by Earth Day because it just seemed to be recycling and tree hugging and no ecology. Us ecologists were sort of resistant and hesitant, and in fact downright negative to it.

Reti: You mean the science of ecology?

Gliessman: Yes. In those days that's how ecologists reacted to Earth Day [1970]. We said, "Well, there's no ecology in this." We weren't very supportive, at least those who were trying to make a name as scientific ecologists. There were others still.

When I went back down in February of 1972 to teach the course, I was taken on as a botanist, a plant ecologist. I would go into the forest and do ecology there, and look at relationships and complexity and diversity and succession and mutualisms, and all the good stuff that happens in a tropical rainforest system. I wanted an experiment. I wanted to see if we could have some interaction with farmers and try and see how ecology and agriculture might interact.

Reti: What gave you the idea to do that?

Gliessman: Well, I think one of the first places we went to, there were some little patches of forest that had been cut down for crops. Our group was how many,

twenty of us, or something like that, students. We would break up into four groups of five and go out with a different faculty member to do a field problem, testing some ecology concept or principle. I decided to go to this farmer's field and try and understand how the soil was being managed, or why the farming was being done in the way it was. The first thing we did was we all picked up machetes and helped him clear, and got blisters, and one of us cut ourselves, and all that kind of good stuff. But we heard the story of how you prepare the land, how you burn, how it fertilizes the soil, how the crop responds, how you get a good yield—this whole story of ecological management. That's basically what it was. Because it wasn't fertilized, it wasn't sprayed. It was using the machete, and fire, and seed, and human knowledge about how to make it work. I was struck by that, because my impression of agriculture had been you drove a tractor, and you sprayed, and you did all that kind of stuff, or you weren't a farmer. But here it was, this little traditional farmer raising a crop with nothing except knowing how to do it.

So we were there for two months for this course, and I'm cogitating this, thinking it over and wondering about it. I had a couple of other opportunities in other parts of the country under different kinds of conditions to ask the same kinds of questions of farmers. We were towards the end of the course, and I'm really thinking, gosh, I want to do this again in a coffee-growing area. Because in those days a lot of the coffee in southern Costa Rica was— They planted it; they just cleared out the forest underneath a little bit and put the coffee under the forest as it was originally evolved to be, an understory species. I knew I wanted to take our group and look at that from an ecological perspective, see what it was like. It

was a Sunday when it was my turn to take a group out. I asked the driver and the cook, "Do you know of any farmers in the area who we could go visit for the morning and help out and learn from?" He said, "Well, it's Sunday. No farmers are working today." But then one says, "Ah, but wait a minute. I know a gringo. His family has a farm about nine miles away, and he's always working. Even though it's Sunday, he'll be working." I said, "Great. Let's see if we can go over."

So we did, and he was working. He showed us what he was doing. It turns out he was the son of a couple who had moved down to southern Costa Rica in 1951 and homesteaded. They cleared land and planted coffee and put in some crops. And here it was, 1972, twenty-one years later, and they're still there, and they're farming. He'd just started a new project. He'd been doing a lot of reading, a very self-taught guy, never finished high school in the classroom, was just at high-school age when his family moved there. They were starting to build a terrace system. He'd read books about organic gardening and farming and soil conservation and decided that he was going to try to build this terrace system, because it was all sloping land. He had gotten the idea from some of his reading to plant along the edges of the terraces a grass. It was a grass that was non-aggressive. It wouldn't spread out into the nearby area. It was a grass to cut and feed dairy cattle.

So he was building this thing. He hadn't planted any crops yet. But he was telling us how he wanted to rotate crops and not just have one crop, and they were going to grow the vegetables up there. He was moving out of coffee into vegetables, because coffee was harder to make money on (there were ups and downs in the market even those days). They are up in the mountains, and down

in the lowlands below us there, a couple of hours away by road, were United Fruit banana plantations. A lot of workers lived down there, and they couldn't grow this stuff, but they ate them. He had the idea of taking the vegetables down there to market them. We spent a morning walking around the farm. He still had some parts that were native forest that he hadn't touched, and even today those are still there. We heard about the difficulties of maintaining soil fertility with all that rain, 250 inches of rain a year, the problems with pests and weeds and all that, and how to make a living. We kept asking questions that showed our ecological understanding, but there wasn't much agronomic understanding.

I remember towards the end of our morning, we were gathered around with him, and I asked him, "Well, from your perspective of having lived there for twenty years and trying to farm for that period of time, what would you recommend that we as ecologists could do to help solve the problems you face?" He looked me square in the face and he said, "Come down and join me. Put what you're learning to use here." I thought, hmm. I thought about it.

Bloomington, Indiana Postdoc

And I went home, back to Santa Barbara, finished my degree, took a postdoc for two months in Bloomington, Indiana to be part of a large study where they had taken a piece of farmland that had been carved out of maple-hickory-oak forest in southern Indiana, and farmed for a while. What they were going to do was take it out of farming and study the successional recovery process in a whole-system study where everything would be looked at—soil, plants, bugs, biomass, the whole thing. I would be in charge of the weeds/allelopathy part of that, and

see how much of a factor that was in this recovery process. Interestingly, it was trying to look at how does agricultural land recover from a period of use, of disturbance. It was all contingent on getting a big NSF grant that would fund this thing for many years. I would be one of the post-docs on this study, with the hope that maybe eventually it would lead into a faculty position, and all that kind of stuff.

Well, after about two months I was not very happy with the project, or just the situation. I remember spending a lot of time in seminars listening to people sit around and try to impress the rest of the people in the room with how much they knew, something that still bothers me about scientists, especially in university settings. (laughs) A little personal bias, or issue. But I kept hearing this invitation to make what I was doing meaningful, rather than just argue and be kind of theoretical.

I also had to worry about the fact that I'd left Santa Barbara on a leave of absence from the National Guard. I was supposed to show up for meetings every month. I hadn't yet found a unit in Indiana. I'd ignored it a little bit. I got this thing in the mail saying, "You must report to duty, or we'll put you on two years of active duty and send you, you know where."

I had a lot of things riding all at the same time. I decided, I'm going to take that job in Costa Rica. So I drove back in my old Land Rover to California. I went into my Guard unit, reported for duty, but then right away told them, "In a month I'm leaving the country to take this job in Costa Rica and I want you to help me figure out a way how to do that. What kind of papers do I need to sign? I need to

get a release. This is what I'm going to do. I'm not staying." At this point I was pretty fed up with the National Guard anyway. I'd had some really— I could talk all day about some of the summer-camp and weekend experiences. I had long hair, but they would never have known it at the meetings, because what I would do is I'd pull it all up into a ponytail and tie it, and put my hat on.

Reti: (laughter)

Gliessman: And then a guy in the lab would take a haircutting kit and shave my neck so it looked like I had short hair. As long as my hat didn't come off during the meetings I was okay. I wasn't the only one who was doing it. And your mustache has to be within the corners of your mouth and not extend over the lower lip. So we learned how to use mustache wax really well. I had this thing all around, back around and everything. It fit within—The sergeant would come up, and boy, he'd look at you.

Reti: (laughter)

Gliessman: He couldn't say anything. It was legal. We just delighted in doing things like that. Anyway, I was to the point where I'd become radicalized. I remember almost having fights with guys in the National Guard who were much more committed, and thought college students should all be lined up and shot, and stuff like that. It was kind of interesting. But I was to the point where I just about didn't care. I told them, "You figure this out, because I'm leaving on such and such date."

Back to Costa Rica: Loma Linda

They called me back in just a few days before I left for Costa Rica. It was right at the end of 1972. They said, "Here. Sign these papers and you can leave." I didn't even look at what they were. I signed them and I left. I was able to leave. But I didn't look at what they were. None of them were filled out. They were blank papers.

So off I went, with an old Land Rover full of stuff. After [I was] down in Costa Rica for a couple of years, my dad sent me a letter saying that he had just received a letter at the house, where I was being called to active duty for two years, that I'd signed a piece of paper that said I would re-enlist at a certain date. Of course, all the papers I'd signed were blank forms. But what I didn't realize was that one of them was a re-enlistment form. I wasn't available to date the signatures on any of the forms, but they'd filled in some dates. So my dad got pretty upset, and I got home from Costa Rica and started talking to our local congressman and accused the National Guard of fraud. Of course the National Guard accused me of trying to get out of my duty and, well, it got to be a sort of confused, potentially contentious case. So the National Guard decided to just drop it and give me an honorable discharge, which I got.

But that's getting ahead of things a little bit. That happened in '74, '73?

I'd gone down [to Costa Rica] with the idea that this is what I'm going to do; this feels like the right thing to do. I left that position in Indiana and went south. And gosh, from the minute we arrived at the farm, I loved it. I had gotten a bunch of scientific equipment from my dad. My dad had quit working for the pharmacy

and instead was working at a place called the Direct Relief Foundation. It still functions today. It's an organization that retrieves old or outdated medical equipment, and doctor's medical samples, drug samples, all that kind of stuff, and then re-organizes them, refurbishes them and sends them overseas to needy hospitals and clinics around the world. They needed a qualified pharmacist to be able to receive and send drugs out like that, and that was his job. He had gotten into thinking about what it meant to be a pharmacist, and was he really helping anybody by pushing pills. He and my mom both went into the Peace Corps later on in life. He went over to Kenya and was teaching practical pharmacy at the university in Nairobi. A whole other story over there.

My dad had received a lot of old scientific equipment—test tubes and beakers, and everything you can imagine. I made an assortment out of it in a big old trunk (it was like a traveling laboratory), in order to study soils, and do kinds of experiments that were ecological in nature in a farming system. Darryl had moved ahead (that's the guy whose name was on the farm, Darryl Cole), had started planting crops.

So I just jumped in and started helping on that, and doing everything you do on a farm. But I also would do different treatments. I'd do a cover crop, or I'd lay down a mulch, and I'd put down quadrates and sample the amount of weeds, and put out chicken manure and compost in one and not in another, and compare growth rates. Just started to gather some numbers that, yes, you could really change things using ecological understanding and organic principles combined.

Reti: Was anyone else doing this kind of study at that point?

Gliessman: Well, it turns out that there were a couple of other people thinking about it in OTS, a couple of the more radical-thinking ecologists at that time. I was in touch with them through the course I'd taught and the course I'd taken. We'd talked about, could you do this kind of stuff or not, kind of a little group. Some of them today still do that kind of work, John Vandermeer at Michigan being one of them. Others that are scattered around still. There was one guy especially, Steve Risch, who was already questioning ecology for being so separate from people and culture, and social issues, and trying to just study nature and not be of value to people.

When I first started at the farm in Costa Rica, we were only nine miles away from one of the OTS field stations. I immediately made contact with them, for a couple of reasons. One was to sell our vegetables to the students when they come to the field station. But two, letting them know that our farm was there for them to do experiments on. Some of the first experiments we did [were to] plant broccoli seedlings in three different places: inside the forest; at the forest edge; and out in the field, and just see how they did. Which one was attacked more by pests? We had all these beginning ideas about how agriculture worked from an ecological perspective.

So there was some sort of academic link there. In 1974, after I'd been at the farm for a year or so, I'd heard about, through the little network of scientists that would come and go down there, that there was going to be the first annual meeting of the International Association for Ecology (INTECOL). They were

forming a new society and a new journal. That year the first issue of the journal would come out, called *Agro-Ecosystems*, which today is *Agriculture, Ecosystems and Environment*. INTECOL held its first international congress in The Hague in Holland. I decided to fill out the paper-presentation request. I wanted to talk about what I'd learned in two years of managing the farm, where I saw ecology working. And lo and behold, it got selected as a plenary. Here I am. I felt like I was just a small player in everything. I had never gotten up and talked in front of anybody like that before ever! And here I am at this big congress getting up and talking about ecology and agriculture. But the two years up to that point, some of our observations, some of the data I'd taken on what worked and what didn't work, was really tempered by the fact that twice a week we harvested and took our harvests and put them in the bins in a camper shell that was on the back of a 1956 International Power Wagon four-wheel-drive truck, and all painted orange. Across the back it said "*El Mercado Móvil.*" Mobile Market. The day after harvest, the next morning at about 3:30 a.m., we'd start out from the farm in the dark, down the road, and the first town in the lowlands below us (we were at about 3000 feet), was about eleven miles away. We'd pull into that town after having left around 3:30 a.m., usually somewhere between 6:00 and 6:30. It would have taken us almost three hours to go eleven miles.

Reti: It must have been some road!

Gliessman: Yes. Usually all four-wheel drive, chains on all four wheels, and a lot of times having to winch ourselves out of mudholes.

Reti: Must have been that 250 inches of rain.

Gliessman: It was something. Yes. No pavement, and not even rock on a lot of the roads in those days. We'd spend the whole day down in the lowlands, going to a couple of the stores that were in the little towns that were around the banana plantations, but then go *into* the banana plantations. Toot the whistle on the truck. One of us would stay in the truck, usually Darryl, and then the other one would take a basket full of vegetables and go house to house around the back of these workers' quarters, where the women were cooking or washing clothes, and sell vegetables direct to the consumer. We were having trouble getting stores to buy it from us, because they were buying from trucks that came from the center of the country with an assortment of everything. We couldn't show up with everything, and we couldn't keep it in constant supply. Same problem farmers have today. So stores couldn't buy from us, because if they bought some from us the truck wouldn't sell them anything. They had to buy from the truck that came from the central part of the country.

So it was a struggle. The store owners didn't want to pay our prices. They wanted to capture it all. And they weren't doing anything except standing there selling. We were doing the growing, and the selling, and the transport, taking all the risk. I was just struck, living that.

Then about 5:30 or 6:00 at the end of the day we'd buy supplies in the last little town, and turn around and head back up the mountain and get in around 9:30, 10:00 o'clock at night. We did that two days a week. Two days of harvest, two days of market. Left us three days for all the rest. Meanwhile, I built a house without any power tools, all hand tools, found out the value of a sharp saw, and how to keep it sharp (laughs), all that kind of stuff.

Reti: What was your wife doing during that time?

Gliessman: She was teaching the girls of the family, the two older girls. One was eleven and one was fifteen at that time when we first got there. The other one was two-and-a-half or three. She's now one of our grad students here in environmental studies, Rebecca Cole, and is doing her Ph.D. in the community down there where we were working with [UCSC environmental studies professor] Karen Holl on forest restoration issues, and working with CAN [Community Agroecology Network] on some of the community-based development stuff, with coffee and all that. Kind of neat. Years later.

So for me, that two years, a year and a half (I don't remember exactly what it was), was such an education. I remember going to The Hague and making my presentations and sort of being scoffed at by the conventional ecologists. But a good number of people at that time who were becoming socially conscious and wanted to see ecology make a difference came to me and said, "This is a good idea. This is what we want to do with this new journal. This is why we are doing this."

Reti: So you were being scoffed at because you were dealing with agriculture?

Gliessman: Yes: "You can't do ecology in a farming system. It's too disturbed! There's no way you can do ecology there." That was the thinking. There was just this small group on the side that was saying, "Now, wait a minute. If all the elements of an ecosystem are there—" So I went back, and for a couple of different reasons decided to leave the farm. I actually thought of staying in the community and working with the local coffee cooperative, the same one we

worked with, with CAN, for a while before it went bankrupt a couple of years ago. Got on the education committee of the co-op, and we started looking at diversification schemes, crop diversification, to get off of just coffee alone. We were doing that in 1974.

I called the Peace Corps office in San José [Costa Rica] and asked them if I could switch over and become a volunteer. I didn't want to go back to the States. I wanted to stay there. They said, "Well, we have to get in contact with Washington and do some paperwork, fill out all these forms and everything else." It was six months later before they finally told me that the job was available. But by that time I had a job in Guadalajara, Mexico. Because I wasn't going to wait.

Guadalajara, Mexico

My wife and I decided to leave Costa Rica. We sold our Land Rover. Half the money we sent home; half of it we used to travel for the next three months. We hitchhiked and took buses from Costa Rica all the way back to California. There's a whole story to be told there. But the main story was stopping in Guatemala City. I'd stopped there on our drive down in '71 and met this guy who turned out to be the brother of a friend that I went to grad school with, who was farming in Guatemala. He had gotten down there working for international companies that were raising flowers, but saw what was going on in that industry even in those days, in terms of pesticide abuse and worker abuse. And ended up somewhere shifting over to farming on his own, raising vegetables to sell to the expatriate community from the U.S. and Europe that lived in Guatemala who

couldn't get any kind of decent vegetables. He found this little market, and started growing vegetables for them. I met with him on the way down and met with him on the way back. We were hitchhiking and stayed at his house. And he told me about a job that he'd applied for in Guadalajara, Mexico, at a big nursery business that was looking for a new general manager to run their business. It didn't pay enough for him, so he'd said no. But he said, "You can check it out." So we called ahead or wrote ahead, or whatever you did in those days to talk to people.

Reti: (laughs)

Gliessman: And he said, "Well, come on by." So gosh, a month or so later we get off a bus in downtown Guadalajara, after traveling all night from Mexico City on a bus. They'd just given us the name of a hotel. I remember it was the Hotel Fenix. I had no idea where it was. So we had the taxi take us to the Hotel Fenix. He kind of looks at us, because, you know, we're in Levi's and Guatemalan shirts and a backpack. We show up. It turns out it's this luxury hotel in downtown Guadalajara. And they look at us. Sure enough, our names were there. The person who had made the reservation for us was one of the co-owners of the hotel, who was also one of the co-owners of the nursery business. (laughs) So we went out there and were interviewed. It was this nursery business that was trying to gear up for export of ornamental plants to the U.S., but had a growing business to little nursery outlets in Guadalajara and through towns up the coast through Culiacán, Mazatlán, Los Mochis, Hermosillo, Guaymas—all up and down the Pacific Coast of Mexico. So I jumped into this as the general manager

responsible for everything from programming our plantings, and propagating, and purchasing, and selling—setting up a whole business in Mexico.

Reti: Okay. Let me stop you for a second. I have a couple of questions. Why was it you wanted to stay in Latin America rather than go back to the States at that point?

Gliessman: I guess you'd call it the taste of the separation, the thing with the National Guard, the frustration with the academic community at that point up there. I wasn't being pulled back, number one. And I really did love living and working in Latin America and was being drawn to it and looking for a way to keep doing it. I'm not sure that the nursery would have been my first choice, but it's the opportunity that appeared at the time, and it sounded like it would be interesting. Both of us liked the feel of Guadalajara when we first got there, and the people that we'd work with. So gosh, we jumped. And for the next three years that's what I did, ran this business.

I think I did a good job with it, but there were a whole lot of things that made it almost an impossible task. Number one, the owners of the business, rather than investing in the business, had loaned money to the business. So every month interest had to be paid on the money they'd loaned out of the money that we were making in building the business. We could never get out from under that. There was never an opportunity for growth. It was just as hard as could be. And then, number two, I have always had this belief that the people who do the work ought to be the ones to get rewarded for it. So I'd give bonuses and raise salaries without asking the owners. They got upset with me about that. It reached a limit

after about three years where I figured I wasn't learning anything new, the business was sort of stuck, and I didn't see a way out of it. But I learned a lot. And we adopted our first child in Guadalajara while we were there, made really good friends, especially with the people who worked with me: my general manager, the accountant, people who were inside our little operation.

Reti: And the plants that you were exporting, were those native?

Gliessman: Well, we never got to the export level. The business was booming so much within Mexico that that's where we ended up focusing all of our stuff. Most of them were non-natives; most of them were horticultural: fruit trees, roses, pansies, you name it. We also had a production farm down in the lowlands, over on the Michoacán side of Mexico, where we grew in the ground tropical indoor plants under shade screens. We'd cut those, pot them up, and then send them in trucks to Guadalajara, where we'd sell them to people who put them in their homes. That was the piece of the business that made the money for us because we really had a kind of corner on the market.

I did all sorts of funny things while I was doing that. For a while I was interviewed weekly on a TV show called *Mundo de la Mujer*.

Reti: "World of the Woman."

Gliessman: Yes. *Women's World*. They'd have me in there and they'd ask me how to take care of their houseplants and stuff. Here I am on this television thing in the middle of the day. I did things like that. Also, I had to deal with the union that we had, and issues around worker pay and all that. I thought I was doing a

good job, but I still had to represent the business, and it wasn't exactly what the union wanted in terms of hours and pay and all that stuff. So that was fascinating. And dealing with the financial side of making a business pay its way but grow. It was fascinating, really fascinating.

But by the end of the third year I was getting sort of frustrated with it. I was trying to get my papers so I could be legal in the country. They had a lawyer that worked with the business above us, for the owners. He was supposedly trying to help me get my papers. He was doing a terrible job. I'd make these trips to Mexico City and go to the place where you get your legal residence and working papers, just back and forth and back and forth, and it just never would go forward. So I decided to try to see if I could get some letters. I thought, well, who do I know in Mexico? It turns out in 1969 when I took my OTS course, one of the students was from Mexico. I knew he was an ecologist. I didn't know exactly what he was heading towards. I had an address that I'd gotten when I was there. So after about two years I sent a letter to him saying, "Hey, can you write me a letter explaining what I'm doing and help me get my papers." I didn't hear, didn't hear, didn't hear. Then about six months later I finally get this letter back. He'd taken a new job down in southern Mexico, in Tabasco, at a little school of tropical agriculture that had been started about a year before. He had started within that school a department of ecology, which is pretty unique in the sense that there probably wasn't an agronomy school anywhere in the world that had a department of ecology. But this guy was just crazy enough to think he could do it. And he did!

Colegio Superior de Agricultura Tropical, Tabasco, México:

The Beginnings of Agroecología

He invited me down to visit. I went down there. This was getting towards the end of those three years. I ended up giving a couple of little talks about ecology. And before I knew it, he offered me a job.

Reti: So that's how you ended up there. I was wondering.

Gliessman: Yes. I was ready to move from where I was, and so was Nanette, and our adopted son, who was about a year and a half old at that time. I told the nursery I was leaving. They weren't especially happy, but I think they kind of were too. And off I went into this school that had started a year, two years before. It was meant to train folks from the tropics in the tropics about agriculture, where most everybody had been trained before was in a big university of agriculture in central Mexico up in the highlands, very much affected by Green Revolution technology.³ Because that battle was going on right then, and people were coming from another place with imported technologies. And it wouldn't work, so they got this idea, "Well, let's do it within the country, and within the region and try to adapt it more locally."

I started teaching ecology to agronomists, and doing studies in the field. Some of the studies were very conventional, in the sense that, okay, here's a field on the experimental grounds of the college where there's been tractor cultivation for several years. Let's put mulch down here, and not here, and see what happens. We were in the middle of a big, internationally funded development project where they had cut the forest down, built little communities for the people, put

them in there, and told them, “You’re going to farm conventionally because this is going to be the breadbasket of Mexico that we’re going to export to the rest of the world.” They thought a school within that area could help solve the problems that they faced. But around the college and on the road from the little town Cárdenas, Tabasco, out the twenty-one kilometers to the school and the experiment station, you’d see alongside the road these remnants of traditional agriculture: home gardens, corn. And if you looked close, you’d notice it wasn’t just corn, but there were beans and squash associated with it. There was this whole other kind of agriculture. And between this guy that hired me down there (Ricardo Almeida), and another guy over in the plant pathology department (Roberto García) who was also very much aware of ecology, we stopped at some of these traditional farms and really began to realize that from an ecological perspective those made a lot more sense than the conventional approach, and the big conventional project that mostly was going on at the experiment station.

So we began to study the ecology of these traditional farms. This started in 1976, September of ’76. And boy, it sure, real quick began to become clear that there was an inherent ecology to those systems. They’d been around for a long time. For us, it was a matter of starting to take them apart and see, but also to get to know the people who were part of it. Because you couldn’t do it without them. They were the ones who had the experience and the practice.

So gosh, all sorts of stuff we began to study. We even designed some things on the experiment station, where we used that traditional knowledge as a foundation for designing some of our experiments. We did experiments on their fields, off the experiment station, using their varieties, but taking them apart.

Like corn, beans and squash—setting up an experiment on a farmer’s field with his varieties and his planting practices with the intercrop as he would do it as one of our experiments, but the monocrop as other treatments, the things planted alone—and look at how they responded and what did best. It was obvious that here was something that we began to call *agroecología*.

I remember driving back up from the lowlands with Darryl [Cole] sometimes after one of those long market days. We’d had a good market day and things had gone well, and we’d talk on our way up the mountain about how important ecology and agriculture were, and that we were onto something here. This is important to really show how the ecology of agriculture could work. I just called it the ecology of agriculture. Then when I was at the nursery for several years I kind of stepped back from that. But still, what became more obvious was how people and plants are drawn together, and how this can be a business, even, especially in Mexico, it seemed like, because their connection with plants was really deep.

And then going down to Tabasco and seeing the traditional farming systems, especially the Mayan systems, and getting to know some of the students who had come from those communities. Most of them had that in their roots. There were kids of farming families scattered around the lowlands of Mexico. They all had that kind of experience. But they were being taught that there was a different kind of agriculture, that that’s what was valuable, *not* what they’d learned growing up from their parents.

Reti: What did the people whose farms you were coming to do those experiments think of you, and what you were doing?

Gliessman: Well, the way we approached it, the way I tried to approach it anyway, was we were learning from them and showing how ecology and what they knew could be blended. Both Ricardo Almeida and Roberto Garcia, the two folks that I worked with there—they knew this. But they hadn't had a way to articulate it very well. And me coming in with a strong background in ecology was able to pull that together, and we started teaching *agroecología*.

At the same time, there was a guy up at the National Postgraduate School of Agriculture, next door, practically, to the Undergraduate School of Agriculture in Central Mexico, at a place called Chapingo. Efraím Hernández Xolocotzi, an old ethnobotanist, agronomist who was also part Native, Pueblan Indian, I think? (I forget): he'd been battling right and left to try and stop the Green Revolution in Mexico, and had been doing it by showing how important traditional farming systems were. By the time I got there, he was becoming kind of cynical because no matter what he did nothing stopped. We teamed up. We did several things together, ran some seminars, did some symposia. We talked about the importance of traditional knowledge and the agroecological foundation of that, and really called it that. It was fun putting all that together and seeing it evolve.

So when in 1978, two years into my time in Tabasco, the next International Association for Ecology Symposium happened, and it happened in Jerusalem, I went and talked about the importance of traditional knowledge for developing

sustainable farming systems in the tropics, and the ecological foundations of that knowledge. So it was fun, and a whole different sort of sense in 1978 than in '74.

Reti: In terms of how you were received?

Gliessman: Yes. It was really kind of neat. And for several years, gosh, we had a great time. Big projects and senior theses and all sorts of good stuff, building agroecology, *agroecología*, spreading it around, writing about it, starting to get some things out into the international literature about it.

That was just beginning to happen, really in a big way, when towards the end of 1979, the first part of 1980, the politics down there started to get difficult. I don't want to go into all the details of it, but a group came into the school who, I guess—how would I say it? They were extreme leftists, some of the Mexican leftists, and wanted to bring that into the school, but they were doing it in a way— They were trying to say that agriculture was benefiting a few; we need to change that so agriculture benefits many, which I don't disagree with. But the technology they were basing it on was conventional agriculture. It sort of got turned into, instead of exploiting the land for a few, they're going to exploit the land for many. But neither one of them are sustainable. I tried to argue that from an agroecology perspective, and I couldn't get through the politics. I got accused of being a foreigner and all that stuff, even though I had a whole crew of people supporting what I was doing because they were doing it too. They had started to have strikes on the campus. Oh, man! It just got to be so that you could hardly work. I was getting a little frustrated with it, trying to stay out of it, trying to get my work done.

Applying for the Environmental Studies Professor Position at UC Santa Cruz

And that's when one of those other little coincidences of life happened. A couple up here in California, the woman was Nanette's college roommate, and her boyfriend was a Vietnam vet who had come back and went through a lot of the protests and stuff. He'd been there in the mid-sixties. It was really a tough situation for him to have gone through, and it radicalized him very much. We were really good friends with them before we left California to go down to Costa Rica, and stayed in touch with them. They came and visited us once in Costa Rica and another time in Mexico. But they'd always thought that they wanted to get us back up to the States. They'd rather we be up here than some ways away. Meanwhile, we adopted another little baby in Tabasco. We had two kids. Nanette was getting to the point where she wanted to return, too. You know, it's sort of interesting to think she missed out on the whole seventies, in some ways, but had a lot of other experiences in other ways. Me too. A really different kind of time.

And it turns out that Joe— His name was Joe Curry. They were up here at Santa Cruz. They were from Santa Barbara. That's where they lived. They were visiting his brother, Bob Curry [an environmental studies professor at UCSC]. They just happened to be going down the hall at Kerr Hall, and saw on a board a job announcement that was an advertisement for a plant ecologist for the department, a specialist in California vegetation, and on a whim (they knew me when I was that), folded it up and put it in an envelope and sent it to us. I got it, looked at it and said, "This isn't really what I do. I haven't been doing it for a

long time,” although I was trained under some of the most foremost ecologists and botanists in California and did pretty good at it. The only thing that caught my eye was the last line that said “and experience in managed ecosystems.” That’s what I *had* been doing. So I filled it out, sent it up. One way or another, they looked at my application, looked at my background and who I’d studied with and what I’d done, and they decided to invite me up for an interview. I came up and I gave an interview, pretty much the same talk I gave when I went to Jerusalem: talked about the value of ecological knowledge in traditional farming systems and developing sustainable agriculture. But I also talked to Ken [Norris] about my love of California vegetation and my willingness to teach in that area. I knew he was probably the one that wrote the job description and was looking for a plant person to complement him on the new Field Quarter and in other courses in the department.

But at that time, too, from what I understand, they were about ready to close the Farm down. It had lost all its funding. It wasn’t connected to any academic programs. Students weren’t even using it anymore. It wasn’t connected in any way. But there were students who were interested in it, especially in environmental studies at that time. So when I came up talking about agroecology, it all clicked. The department at first struggled with—can we get that plant ecologist we need, and can we get someone who can save the Farm? They went back and forth on it, and finally decided, “Well, yes, let’s give it a try.” I’d come up in May for my interview, and they didn’t tell me until November of 1980 that I had the job. I arrived here a few weeks later, right at the end of the year, of 1980. Officially started on the payroll in November of 1980,

and offered my first courses in winter quarter of 1981, and have been going ever since. I taught agroecology the first quarter I was here and Field Quarter the second quarter.

The Earthquake in Nicaragua: A Near Miss

Reti: So today is May 25, 2007, and this is Irene Reti. I'm with Steve Gliessman in his office at PICA [Program in Community and Agroecology] down at the base of campus. Steve, today let's start by talking about your near miss with the earthquake in Nicaragua.

Gliessman: Well, as I talked about before, after I had finished my graduate degree, I spent a couple of months in Indiana trying a postdoc and deciding I didn't want to be in an academic position. It just didn't feel right for me at the time. It didn't feel like it was helping solve any important problems. So we ended up driving down to Costa Rica right at the end of 1972. The Land Rover that I was driving was old. I'd actually fixed it all up and had driven it to Costa Rica and back in 1971 for a project we did. It was that project in 1971 where I had seen all this land-clearing and unsuccessful attempts at farming—one of the things that really got me thinking about how ecology should be doing something differently in terms of agriculture in the tropics. I'd put together a little laboratory. I don't know if I mentioned that my dad—

Reti: You did. The pharmaceutical supplies.

Gliessman: Right. All these old donated materials. Out of all that, I put together the workings of a laboratory. I wanted to be able to continue to ask questions about the ecology of farming. I was thinking about it at that point. I wouldn't

have taken the lab with me otherwise. It was so I could ask questions about soil and about plants. So I had all this equipment, a couple of trunks worth, plus everything we could stuff into this Land Rover, and was kind of thinking that this was going to be a long-term place for us to live. I didn't think I was going down there for the short term or anything. We sold everything we had up in the States. This was a life move.

So of course it was interesting when we'd pull up to the borders and go through inspections. They'd open these trunks and they'd see beakers, and flasks, and scales, and little things that I'd put together to be able to do lab work. I was never even quite sure what I was going to be doing with it all, but knew it was something I wanted to be able to do. We had an itinerary for the trip. I'd left it with my parents so they'd know kind of where we'd be and when we would end up Costa Rica. Remember, in those days we didn't have cell phones and we didn't have e-mail. All you had was the mail, and it wasn't very good. There weren't even really phones in most of the rural areas. We forget about how quickly we've moved into this new technology stuff, boy!

Our plan had been to leave southern El Salvador, where we'd spent a couple of days with some friends of my dad's, and we were going to drive through the southern part of Honduras into Nicaragua and spend the night in Managua. That was our plan, and that was what everybody knew we were doing. We crossed the border into Honduras without too much trouble, and then we got to the border with Nicaragua, I guess it was about one o'clock in the afternoon, or something like that, when we got there. There was this young border guard, or whatever he was. Right away I could tell this was not going to be easy, because

his whole attitude seemed extremely negative, very stern. He told us to unload everything in the car, both from inside and from a rack we had on top, into the customs inspection station. Nobody had made us do that. They'd kind of gone through it, but they hadn't made us unload it anywhere. I tried to talk my way out of it, but to no avail. So we had to unload everything, and he went through everything, and then let us eventually load it all back up again and put it back in the car, but he didn't give us permission to leave. It must have taken us at least a couple of hours at least to do that part. And then it was lunch break, siesta, and nobody was around. We were sitting there. We didn't have the stuff back in the car yet. Finally we got it back in the car and then he said, "I want to look at it again. So we had to unload the whole thing again.

Reti: Oh, my gosh!

Gliessman: It was hot. I was getting really, really angry and having a hard time controlling myself but knowing I had to. It was just ridiculous. It didn't make any sense at all. So we finally managed to go through it all again, and put it back into the car again. It must have been, I don't know what time, 5:00, 5:30? We'd been there like four, four and a half hours unloading this stuff. So by the time we got it all loaded up again and they finally let us go— Probably what was happening was that I was still pretty naive at that time still, and if I had just paid him off when we first got there nothing would have happened. But I didn't think about that stuff in those days.

But I was so frustrated, not just with that experience, but also with Nicaragua, that I decided, we're not going to stay in Managua. I'm going to drive all the way

through. We'd had this idea that we wouldn't drive at night. We'd drive through the day and find a safe place to park and then spend the night, because we had the car all loaded with everything and all that. So I remember we pulled right into Managua. The highway went right through the middle of the town, the capital city at that time, and it was, what, the 22st of December or something like that, and tons of people on the streets at little stands selling stuff, Christmas stuff and all that. We just went right on through town, and out the other side, and down to Costa Rica, which was two and a half hours further south.

We got to the Costa Rican border at about 11:00, and real quickly got through, and went another hour or so south to a little town, and found a little hotel, and pulled in and spent the night. The next morning we got up and got in the car and headed south to San José. But I remember, as soon as we got on the road and got a little bit further south, suddenly we started seeing ambulances and fire trucks headed north on the highway. We didn't know what was going on. We went all the way into San José and stopped at a gas station. And the guy asked me at the gas station where I'd come from. I said I'd come from the north, went through Nicaragua. He said, "Did you see the earthquake?"

Reti: Oh, my God!

Gliessman: That's when we first heard. And it turned out that the hotel in Managua that we had planned to stay in completely went to the ground.

Reti: You're giving me chills. Whoa. (shudder)

Gliessman: Yes. It was pretty amazing to think that if it hadn't been for that border incident we would have spent the night in that hotel and we wouldn't be here today. Yes. It's crazy.

A couple of years later when we were headed north again after being in Costa Rica, and took our bus trip, and hitchhiked and stuff, and got back to Managua. There was just nothing. I mean, the whole place was leveled. And even today, a large part of the downtown of Managua, which they built on an old lake bottom, it's like building on a bowl of jello—

Reti: Oh. Liquefaction.

Gliessman: Yes. They have not rebuilt most of that area, and they've dispersed the center part of town to surrounding regions, and have left that whole lower part to nothing more than single-story dwellings.

Reti: That's right where the hotel was, downtown.

Gliessman: Yes. Yep. It was something.

Loma Linda and Trying to Farm Organically

That lab equipment became an important part of what I did at Loma Linda. I'd do little things like— Oh gosh, we experimented with using composted chicken manure versus chemical fertilizers. I would sample weeds and weigh the crops, and I'd dry them. A lot of that lab stuff I never used, but some of it I did, to start getting some basic numbers about comparisons between conventional and organic. We tried to manage the farm organically. It was Darryl's goal. He'd done a lot of reading before I'd met him. All the Rodale stuff at that time was

about all there was. They had their *Organic Gardening* magazines and a couple of books on organic gardening, but there wasn't much else. Darryl had read most of that stuff. We talked about it, and he had some of the books on his shelf down there. I had all my ecology stuff with me. I had brought a small collection of books, not much, because you can't fit too much in a Land Rover.

Whenever we could, we tried farming organically. But when problems really got bad, we sprayed. But I'd always wait as long as I could to do that. Darryl would want to spray sooner than I would, but I would wait longer. Or we'd use chemical fertilizers, because we didn't yet have enough compost or material to use, although we were using cover crops and trying to improve the soil with plant matter, and green manure and all that. But with a couple hundred of inches of rain a year and very porous, well-drained soils, it was really difficult to maintain soil fertility on permanent beds, which the terraces we built for the vegetables were. I also remember that in the coffee plantations that we had on the farm, there were a couple of disease organisms, fungus diseases that really caused problems, and the only solution to them at that time was spraying with some pretty heavy toxic materials. One of the things we sprayed with was lead arsenate.

Reti: Whoo!

Gliessman: I never sprayed it myself, and Darryl wouldn't spray it, but our workers did spray it. I can remember some of the times them coming up out of the *cafetales* after having sprayed for a couple of hours, their eyes completely red and wet with the stuff, because they were spraying overhead. The bushes were

taller than they were. We didn't have any other alternatives. Nobody else knew anything. If you didn't spray, the plants defoliated and you lost your crop. There was no option yet. We hadn't developed alternatives. Some of those diseases are still major diseases and cause major problems for folks who try to farm organically today in that same region.

Reti: So the indigenous tradition of subsistence agriculture, or whatever you want to call it, that existed before these pesticides, would not have been farming coffee?

Gliessman: No. Because see, Costa Rican— It's not like in Southern Mexico where the Maya had a really strong tradition of traditional farming, and non-use of pesticides that was still working. Most of the Costa Ricans that we worked with were of Spanish origin, and hence brought with them a more conventional, European form of farming. It's a controversial subject sometimes as to how many of the indigenous people were alive and living in Costa Rica and farming when the Spaniards arrived, how long they survived. Apparently it wasn't very long, and the few that did were in very isolated parts of Costa Rica. What became the main farming was a basically a European style of farming, very early on.

Reti: I see. So it's important to understand the different histories. You can't conflate Mexico with Costa Rica.

Gliessman: Yes. And there was still a traditional, what you would call a *campesino* or local kind of farming system, more diverse, sometimes a home garden. A wonderful system that they used in Costa Rica that I got to know was a thing they called a slash-mulch system for bean production, where they would

come into second-growth vegetation that was, oh, anywhere from eight to ten feet tall, and a mixture of grasses and shrubs and things. They would take the bean seed and actually cast it into this vegetation, and cut the vegetation on top. It was a semi-indeterminate variety of bean that would grow up through. It wouldn't just form a bush, nor would it be a long vine. Kind of in between, enough to grow up through the mulch, which is sometimes a foot deep over the surface, and then lay out on top of it. It was a local tradition of farming that we think came from the indigenous culture that was there before, and was picked up and adapted by the European farmers. They mixed together and became a local farming system. We used it quite a bit, and one of my former grad students did her Ph.D. on that system, trying to understand why it worked as well as it did, and local varieties of beans that had been selected over time. So yes, going back to your question, there is a good example of traditional knowledge being used.

But as coffee became the crop of choice for so many of the farmers and they hooked into that whole commodity market for coffee, people began planting more and more coffee and less other things, to the point where fairly recently coffee was about the only thing that was grown, and they would use the money that they made from coffee to buy the stuff that they'd grown before. I'm getting ahead of myself a little bit in terms of what we're doing today with coffee farmers there.

Reti: Right. We'll definitely get into that later.

Gliessman: Yes. But that's how it was then. And the vegetable operation we had was an attempt— It was like there wasn't much we could do with coffee, so

Darryl had decided to diversify into vegetables, based on the fact that there wasn't enough local production both in the community and down in the lowlands where we sold, especially down there. So there was a market, and his desire also to try to farm organically on top of it.

I remember one time I was so determined to not spray that when we had an outbreak of a little caterpillar—it was called a cabbage looper and it really does a number on vegetables— It's very common, pretty much all over where you grow cabbage or cole crops in general you find this thing. There are good bio-control systems for them now, especially the *Bacillus [thuringiensis]*, the little bacteria that you can make a suspension of the spores and spray it on and they germinate, or the spores on the leaf and the caterpillar eats the spore, and the bacteria of the spore gets inside the gut of the caterpillar and germinates and grows and kills the caterpillar from inside because it releases a biotoxin that kills the caterpillar. Of course we've figured out now how this works and what the genetics of it are. One of the main genetically modified organisms right now are crops where they've extracted that toxic factor from the bacteria and injected it into the crop, so it's in the crop all the time. It's in soybeans. It's in cotton. It's in a couple of other crops that are hit by *Lepidoptera*, by caterpillars, pretty commonly. And a big controversy over how safe it is to use it, number one. Since it's in the plants all the time, how it could potentially escape from the plants into the wild, be passed to wild relatives like mustards, wild mustards, and create super-resistant weeds. It's being researched. Again, we're getting ahead of ourselves.

What happened was that this worm was in our fields. The caterpillar was there and it was starting to cause problems. I said, "Well, let's wait. Let's see if it will

die back on its own.” I was a believer in the fact that things would reach a point where a natural control would finally step in. And it just kept getting worse and worse, and they moved off of the cabbages onto lettuce, and lettuce onto beans, and beans onto radishes. They were starting to hit everything. I remember I had gone out there the night before and the damage was so bad— This was all over a period of just like two weeks. No more. It had gone from just appearing, to being everywhere. Darryl had gone out that one evening and said, “We can’t handle any more of this. We’ve got to spray tomorrow.” I had to say, “Well, yes. Okay. There’s not much we can do. It’s obvious we’re beginning to lose all our crops.” So I was prepared to start spraying that next morning with a couple of pretty nasty things that you can’t even use today. So the next morning at sunrise I went out while they were mixing up the sprays. I made one last little swing through the fields. And I’ll be darned if every worm was hanging upside down from its hind end, attached to the leaf, curled up, shriveled, all blackened and dead throughout the whole field. There was not a live worm anywhere!

Reti: What happened?

Gliessman: What I think happened is that the population of the worm finally got to some critical mass where it was dense enough to allow the invasion of a bacteria or a fungus. I suspect it was probably a bacteria. And it moved like lightning through the whole population. But you needed a dense population for that to happen. In most farming systems we keep the level of the populations too low for it to be effective. Hence we have to spray it on. I messed around a little bit. I went out and I gathered a whole bunch of them. I ground them up, and mixed them with water, and made sprays, and I tried to use them. I tried to do

an experiment with spraying some places and not others. But I had a hard time trying to control the experiment, and I was doing so many other things, that we never gathered data. But I suspect that it could have been a biocontrol agent that could have had a pretty good value. Who knows? One of those things that happens that farmers see every day but never have time to take advantage of.

Reti: That's remarkable.

Gliessman: It was a fascinating experience, something that I think of often when I talk about how we design farming systems to select for problems rather than allow them to generate solutions to the problems themselves. Anyway, things we tried, things we learned.

We worked a lot with the OTS, the Organization for Tropical Agriculture studies groups that came from the field station nine miles away. They'd come over and do little surveys and experiments. We did all sorts of stuff. I remember putting posts—they were actually coffee stems that we had pruned out of the coffee plantation—and put them at distances around the field as perches for birds, especially birds that would be active predators on some of the pests, just to increase the numbers of them. Because there weren't perch sites in the vegetable field.

Reti: Did that work?

Gliessman: Oh, yes. It worked. We had a couple of different species of birds, I remember, that really began to move in, and use them, and work the fields. Whatever you could do. Stuff like that was what we tried to work on.

But at that time our understanding of organic farming was still in the early stages, especially in the tropics, where a lot of the crops we were growing weren't even tropical and here we were trying to make them grow in the tropics. Things like tomatoes—well, that's a semi-tropical plant, but more dry tropics rather than really wet, humid tropics, especially the modern varieties. Most all of our seed came from the big seed companies. They were imported into Costa Rica, and it was the only source of seed that we had. Obviously not varieties that had been selected for those conditions. But that's what we had to work with.

Reti: That's another problem.

Gliessman: Yes. Frustrating, in the sense that we didn't have our own seed, and weren't prepared to grow our own seed. Which brings me back to this movement that's going on today, where farmers are starting to save their own seed, and there's help from some governments, and non-profits, and other organizations to develop *ferias* or trade fairs, but on a local, rural level, where farmers come together and bring their seeds, and show them to each other and exchange them, and then take them home and plant them. In Brazil that's turned into a business, where these farmers' organizations are actually packaging the seed now and selling it.

Reti: Yes, what we have in front of us here [on Gliessman's desk] is really quite a slick-looking package.⁴

Gliessman: Oh yes. It's all the work of an agroecological cooperative in Brazil. So stuff eventually comes back around. Hopefully it's not too late, and we haven't lost some of these varieties, and there's still time to develop new ones. Because

we've got about a forty-year gap in there where local seed production really almost disappeared and now we're trying to bring it back again.

Reti: (sigh)

Gliessman: Yes, gaps in knowledge.

More about Tabasco, Mexico

Reti: So then you wanted to tell me more about when you were in Tabasco, Mexico.

Gliessman: I do remember going over to the University of Guadalajara, which was kind of on the side of town where we lived, and meeting with a woman, Dr. María Puga. It was the School of Agriculture at the University of Guadalajara, and she was in charge of an agricultural herbarium. One of the things that she had in that herbarium were some of the first seeds found of the perennial seed corn, the *teocinte*, it's called, that we think is one of the precursors of modern-day corn. She and her group had found these seeds in some of the hills above Guadalajara in the state of Jalisco. They later found them in some other places in the mountainous regions of Mexico, but this was really the first documented case of it. Boy, there was lots of interest in that seed. Because it had the old genetic information about resistance to pests and diseases, and was able to grow in poor soils and all that stuff, and still be productive. Of course, all of the modern breeders of seed at that time were very interested, because they wanted to capture some of that stuff so they could, of course, patent it and sell it. And some of the others of us—Dr. María Puga wanted to capture the traditional knowledge that was inherent in it, the fact that these perennial seed corns were around fields

of annual corn today, and there was probably some constant gene flow back and forth, potentially anyway, going on. So it was fascinating stuff.

Reti: I had no idea there was a perennial corn.

Gliessman: Yes, I met with them and gave a couple of talks. We started talking about trying to do a little work together, and maybe involving me in some of the teaching and stuff going on at the University of Guadalajara.

Another thing I remember is while I was doing the nursery management there in the evenings, I was sitting at a table with an old beat-up typewriter typing up the manuscripts from my Ph.D. thesis. I never had time to do that when I was down in Costa Rica.

Reti: Yes, I can imagine, with the kind of schedule you were keeping driving vegetables up and down the mountain!

Gliessman: But I finally got back to it there in Guadalajara. By the time I finished at Guadalajara I'd published the main pieces of my Ph.D. thesis. Huh. Funny that I kept doing that. But it was fun to do and get that information out, my old bracken research in allelopathy.

Reti: So you had finished your dissertation before, but you were publishing articles based on it?

Gliessman: Yes. I felt like I owed it to my professor. He had supported me so much, and it was important to get this information out. And, I'm bragging a little bit, but it was some of the best work done in allelopathy up to that point, in

terms of demonstrating how factors interact and affect each other, and helped spread the knowledge that allelopathy is an important ecological factor. A lot of people didn't even think it was real, or it was a very isolated, unusual phenomenon, not something general amongst plants in the environment. Well, that's changed. But at that time nobody believed in it, largely because we didn't have the technology to demonstrate the pathways of production of the chemicals they were releasing into the environment, their uptake by other plants, the effect they had. That all came later. We were working more on the field side, and having to show what wasn't working, that it wasn't competition for water; it wasn't competition for nutrients. And kind of by process of elimination, work it down to chemicals that we could show were there—by making water extracts of plants, and planting seeds in it and showing inhibition. We weren't really capable yet of identifying what they actually were. That was interesting stuff.

So I moved to Tabasco and got back into the work with teaching and ecology, started by just teaching ecology, and realizing that to get agronomists to be interested in ecology, I had to put it in the context of agriculture, which I was headed towards doing anyway. And then finding the traditional farming systems retaining the practices that they'd developed over centuries, and looking at those systems ecologically, and seeing the factors working, the interactions happening—from allelopathy to biological control—it turned into agroecology. It had to. That's the direction it was going. Very soon that's what I was teaching at the school.

Reti: And that word itself. What's the origin of the word *agroecology*?

Gliessman: Well, for me, it probably goes back to a paper [by] a guy named Dan Janzen, [who is] well known in ecology, tropical ecology, [and] still lives in Costa Rica and had a lot to do with some of the forest preservation and restoration that's gone on, especially in Guanacaste, the northwest part of Costa Rica. He published a paper called "Tropical Agroecosystems," and he was mostly talking about how we need to look at agricultural systems in the tropics as *ecosystems*.⁵ That was a big step, to get people to begin to think about an agricultural system as an ecosystem. That was a pretty important paper. I cite it even today as a landmark. And then, as I think I mentioned earlier, INTECOL, the International Society for Ecology, in 1974 in their first congress, also began talking about agro-ecosystems. It wasn't totally accepted that it be a single word.

So I ended up in Tabasco in 1976, as this discussion was going on back and forth about agro-ecosystems and agro-ecosystem study. Well, I picked up on that concept, and thought, well, how do you study agro-ecosystems? You study it using agroecology, *agroecología*. We thought, "Well, let's use an ecology adapted to agriculture. Let's call it agroecology." There were two or three of us there that were looking at tropical agro-ecosystems, and working together on them, and we came up with it. It was Roberto García and Ricardo Almeida. Ricardo was the one who got me down there in the first place, and offered me the job, and Roberto was the plant pathologist that was more an ecologist than he was a plant pathologist. Between the three of us working together, and looking at traditional systems, and trying to design alternative systems using that knowledge, *agroecología* emerged.

Reti: Fascinating.

Gliessman: I think it was probably one of the first places where it did at that time. 1977 probably is when we started using it pretty regularly amongst ourselves. I remember having discussions with other Mexican ecologists about if it should be agroecology or *agrobiology*, *agrobiología*. Rather than *agroecología*, trying to be, I guess, more encompassing or something, biology thinking that it was bigger than ecology. Well, it was fun. That's when I think I began interacting with that ethnobotanist [I mentioned earlier] Efraím Hernández Xolocotzi. He was an ethnobotanist-agronomist, who had in the early sixties gone to the north. He was at Yale School of Forestry or Agriculture, and was working on traditional varieties of crops for his Ph.D. work, just at the time that the Green Revolution was beginning to explode and all these manipulated hybrid varieties and all the practices that go along with them were being touted as the solution to world hunger problems, and Norman Borlaug was spouting off. He's still spouting off.¹ (laughs)⁶ But anyway, Efraím, or as we called him Xolo, Maestro Xolo, he was trying to say, "Well, wait a minute. We've got all this local knowledge about farming systems that's evolved over centuries. Let's not just throw that out and put something in its place that's going to make farmers totally dependent after being self-sufficient for all these years." He was laughed out of the place. Yale (or was it Harvard? I can't remember. I think it was Yale) tried to force him to take his thesis and orient it towards Green Revolution technology. He just told them, "The heck with you guys," abandoned the Ph.D. work and went back to Mexico, and began developing a whole focus on what he called *Agroecosistemas de México*, Agroecosystems of Mexico, based on traditional farming knowledge, and almost single-handedly began programs to rescue, in a sense, or recover or gain

knowledge of the importance of these systems. He was one of the first people to come up with a framework for looking at agroecosystems that incorporated an ecological, a socioeconomic, and a technological framework, where one affects the other. In traditional farming systems they all are balanced. All three elements: ecological, technological, and socioeconomic play off one another, and over time co-evolve to produce the agroecosystem.

With that going on, we were thinking about the beginnings of sustainability. What he would say is that with the modern varieties, and the focus on the economics of agriculture and agribusiness, it was giving too much emphasis to the socioeconomic, producing technologies to make money, rather than integrating at the same time the ecological understanding necessary to create balance in the system. He was right. I began working with him, showing how I was using ecology and *agroecología* as a way to understand that ecological part. So we complimented one another.

Reti: So you were working directly together.

Gliessman: Yes. And we held a couple of symposia, actually, in Mexico, on traditional farming systems. And a book we published in 1978 on a regional seminar on traditional agricultural technology is still— It's a wonderful little book that we published at the college down there that I was teaching at that really is the foundation of what we're looking at in traditional farming systems today. I think maybe in that book we might even have used the word *agroecología* at some point.⁷

But at that meeting in 1977, it was after that that we decided to organize in the summer of 1978 our first, what I called an intensive short course in tropical agroecology. Down there, July was our summer month, not really summer (it was the wet season), but when we didn't have classes. So we brought together folks from all over Mexico, and a few folks from outside that I knew, going way back to the days with OTS down in Costa Rica. We organized this course that was mostly taken by Mexicans, but we advertised it and we got some Central American participants as well. It was a four-week intensive field course. Every day we would go out in the morning and do fieldwork, and come in in the afternoon and process all we'd done, and then in the evening have lectures and presentations. This went on for four weeks. God, we did crazy stuff! We really had a good time. But boy, people were worn out by the end of it. I remember things like going out at night and putting up mist nets to catch bats, and then working these bats out of the nets with gloves on, making sure they don't bite you, because there're vampire bats and stuff down there too, and all the bats carried rabies. But we wanted to see who was out doing what, and if they had pollen on their noses from different plants.

Reti: Oh, my God! (laughter)

Gliessman: Imagine being out at night in the tropics with gloves and a headlamp, and you've got to hang on to this bat. You can't let go of it, because it will swing around and bite you. And mosquitoes are attracted to the light, and they're covering your face and they're biting all over you.

Reti: (gasp)

Gliessman: And you can't even bat them away.

Reti: (laughter) No pun intended!

Gliessman: It was something— (laughs) Yes, no pun intended. Anyway— Yes, we did some fun stuff looking at the ecology of farming systems, really trying to do agroecology.

And in that first course I taught in 1978, there was this person who was a teacher, she had just begun teaching. I think she was trying to finish her Ph.D. but had started doing some teaching at a university in Mexico City called the Iberoamericana University, a Jesuit university. She was in the department of anthropology, but working under a faculty member, Dr. Ángel Palerm, who had been doing stuff similar to what Efraím Hernández Xolocotzi had been doing, but as an anthropologist. He'd studied some of the prehistoric remnants and information about what was agriculture like in these regions before the Spaniards arrived, and what did it mean in terms of the evolution of agriculture in the area today. Fascinating stuff. And she had worked with him, did her Ph.D. under him, doing studies in communities in several different parts of Mexico to try and get kind of a historical, anthropological look at what kind of farming systems had been there. When she heard about the short course in agroecology, she decided to come to it and participate, to learn the ecological side of some of the stuff she'd been doing. She'd been influenced, I guess, by some of the folks in anthropology who do what we call cultural ecology, and wanted some more of the ecology. She hadn't been trained in it. And that's why she came, to see the interface between people and nature. She'd thought a lot about that. Very soon

into the course I realized that she wasn't just a normal student, that she was a faculty member, and that she was carrying a pretty important message about why she wanted to be there, and how to work ecology and culture together. I said, "Hey, I want you to present more of what you do and why it's important." And out of that we developed a relationship that continues today.

Reti: And what's her name?

Gliessman: Alba González Jacome. A phenomenal lady. We've had a lot of good times together, and worked together on lots of different projects. I know that she probably, more than any other person, opened my eyes to the importance, number one, but the ways, number two, to link this nature-culture interface. From the very beginning it became a very big part of agroecology for me, that you can't just do agroecology on crops.

Reti: There are people involved.

Gliessman: There are people involved, too. I remember in some of the early days of agroecology trying to tell people that agroecosystems are more complex than natural ecosystems. And people would just laugh and say, "What do you mean? They're simplified ecosystems. There's nothing complex about them at all." I would try to respond by saying, "Well, wait a minute. You got the human factor that complicates things to no end. And how do you work with both at the same time?" Well, that was at a time, of course, when the Extension model was so predominant, where you develop technologies at the research stations and at the ag centers and you transfer it to the farmers. And if the farmers don't adapt it,

it's because they're dumb, or backwards or—I don't know, whatever. It's sort of the attitude of—

Reti: Here we are offering these technological solutions.

Gliessman: That was pretty interesting, when here we were trying to say that all systems are agroecosystems, but a lot of them have more or less culture as part of them. And look at these systems that have centuries of history under incredible conditions: pre-high technology, pre-fertilizers, pre-sprays, pre-machines—everything. And the evidence was just starting to surface at that time too, that these weren't just scattered little small tribes of people. They were civilizations, highly developed, with very intricate social relationships, economic relationships, and farming systems that had evolved and developed in lowland tropical regions. It told me that that piece, the cultural piece, is essential.

So working with Alba over the years has always been really valuable and important to me. In fact, we're working on a book right now on the transition process from what we'll call conventional to sustainable farming systems. I've asked her to write a chapter about the cultural transition that's necessary to do that.

Reti: So this is an international anthology?

Gliessman: Yes. If I ever get time to finish it. Anyway. That's another story. I wanted to add that piece. And ever since I came up here to Santa Cruz, she's actually come up a couple of times, given lectures in a couple of my classes.

Some of my students have gone down and spent some time with her students in the field.

Reti: So now we're talking thirty years that you've been collaborating.

Gliessman: Yes. We've done several publications together over the years.

So where does that bring us back to?

Arriving at UC Santa Cruz in 1980: the State of the Farm and Garden Project

Reti: Well, that brings us to you arriving at UC Santa Cruz. We talked last time about how it was you found out about the job, and what brought you here. You were saying that at the time you got here the Farm and Garden was about to close down. Can you describe what you saw?.

Gliessman: Well, I remember when I came to interview, a person took me to the Farm. I wandered around and looked at it. At that time it was pretty isolated. They still had a donkey that they tried to use to farm with, and they had this old, beat-up, tiny little cultivating tractor. You had to hand-crank it to start it. And mostly it was the garden at the Farm that they had, plus the Garden up on upper campus. They were farming organically. They had the beginnings of the apprentice course. It wasn't very many people. It was more kind of a residential group that had been there for a while. And I guess a year or two before, they had gotten a fifty-thousand-dollar grant from Alfred Heller. I don't remember exactly how he was contacted, but it hadn't been too many years before when he'd produced the book *Cry California* talking about the state of California as an

environment, a pretty important book that a lot of people have forgotten about. He put his finger right on things we're smack dab up against right now. He was personally interested in alternatives as well. He'd heard about the plight here. Maybe it was through one of the members of the Friends that was just coming together, thanks to Louise Cain, and Phyllis Norris, and a couple of other people at that time, who were like the den mothers for the Farm and Garden, and would hold bake sales and cook for the kids, and do other things to try and keep the whole thing afloat. And with Stanley Cain as an instructor in environmental studies at that time, why, Louise would use him as a contact to try and nudge and push and make noise about—here's this resource that should be taken care of. That was when the Arboretum was just getting going too, in a sense, and they were jointly supporting both ventures and saying that they were important.⁸

But when I was taken down there and looked around, I thought, well, this is neat. It's what I tried to do when I was farming in Costa Rica, and in many respects what the traditional farmers in Southern Mexico are trying to do. There are elements of it there as well. I felt a bit of an affinity to the farming systems that they were trying to manage. At that time, boy, most of the folks were in a pretty alternative lifestyle, still kind of grounded in the hippie days. I had been almost that way myself before I'd left and gone south. So after ten years of being gone, I reconnected to where I'd been before I left, in some ways. And I'd been doing agroecological research, and saw a potential for being able to do that in these systems as well. I remember talking to the folks who were there, Dennis Tamura⁹, and Jim Nelson, the original manager, especially about how we could

really do research on the stuff they'd been doing, and give a sound foundation in ecology to why what they're doing is good to do and important to do.

Reti: Because that research had not been —

Gliessman: It had not even been begun.

Reti: It was all practical.

Gliessman: Yes, all very practical. Learning it and doing it. They knew it worked, but they didn't know how or why. I guess they themselves were really feeling the crunch, and knowing that they were isolated. The student fees had been voted in, I guess, in the late sixties or early seventies. They'd changed. The students had voted them out. They'd stopped devoting part of their registration fees to the Farm. There were no student fees to support it. The only support was donations locally, and hard work, and almost no budget, and most of the folks worked without a salary. And without salaries, how long can you survive? No benefits, nothing.

The money that Heller had given, I guess, was meant to be interim funds, meant to be leveraging funds to try and get more funds out of the campus. They had gotten it a year and a half or two before, and no other funds had been forthcoming. No other support had been forthcoming from the campus. Heller wasn't going to give any more. That's how he's always been. He gives something if he knows it's going to generate more support, and he gets frustrated with systems when that doesn't happen.

But I came, and after I got the job and came up here, the very first quarter I was here (it was winter quarter), I taught agroecology for the first time. We didn't have a lab. We didn't even have a department. We were in Kerr Hall at the time. There were no labs for any of the faculty. One of the things I'd been promised was a lab over in biology. When I got here they said, "No way." Biology didn't want anything to do with it. So I said, okay. What we worked in was wherever we could. And thanks to Janey Scardina, who was the bursar at College Eight at that time, she found a little empty room in College Eight for me. I didn't get any start-up funds either. In those days there weren't any.

Reti: No kidding. Wow.

Gliessman: So I had to start writing some grants right away. There was the UC Appropriate Technology Program at the time. I wrote a couple of small little grants, a thousand dollars here, two thousand dollars there. It allowed me to buy some of my first equipment, a little tiny drying oven, a scale—a couple of things so that I could almost get back to the little lab I had in my Land Rover going down to Costa Rica. (laughter)

Reti: (laughter) Here you are, at a major university!

Gliessman: So yes, there wasn't any of that kind of stuff. But we made do, and we started doing stuff. Then that's when I met Kay Thornley.

Reti: I wanted to ask you about her.

Gliessman: She knew Louise Cain pretty well, and herself was committed to the ideals of the Farm. I guess she'd gotten to know the folks who were there. I don't

remember the exact details of that relationship. She was one of the first people I talked to when I started talking about, how are we going to help the Farm? I had my own reasons for wanting to do that, because I had no access to a field station or field sites. That was *it* for teaching and for research. But at the same time, I began learning more about the group that was there, and their ideals around the beginnings of the apprentice course. It was still pretty unorganized. It was mostly just a place to be for a while, and work together and grow some things. It didn't have a curriculum. It didn't have a training program. It had some people who knew organic farming, in the form of someone like Orin Martin, who had actually worked with Chadwick. Dennis [Tamura], I think maybe had. Maybe Jim had, too. I think they'd all had a little experience. I remember talking especially to Dennis, his feeling that unless they could make some connections to upper campus, and connect to academic programs on campus, they weren't going to be able to keep the thing going. And they couldn't afford to, either, because they didn't have permanent salaries and stuff.

Beginnings of the UCSC Agroecology Program

So this whole issue of how to keep the Farm going immediately became something to think about. When I started talking to Kay, we started thinking, well, let's link the agroecology, the academic piece, with the practice at the Farm, and make a program, and hopefully be able to not just promote the Farm and the Garden, but to create a resource for our students at the university. I remember coming up here for my interview. And here it was, a job for a plant ecologist, a specialist in California vegetation. What do I get up and talk about? I talk about agroecology and traditional agriculture in Southern Mexico. I didn't even

address the topic of the job description in my talk. The room was packed! There were tons of kids.

Reti: I was there.¹⁰

Gliessman: Oh, wow! There were people on the floor. It was so much fun. I just had a ball. People got all excited, and I was excited. The whole thing was great fun. That was the beginnings of that shift, all that interest on the part of the students. The first class was overloaded when I first taught it that first winter. We went down to the Farm and they had built that one greenhouse at that time, and that was our lab. We'd hang out in there in the wet weather (because it was winter), and do stuff, do little experiments that I'd been playing with in agroecology for a long time, adapting them here. Because we didn't have any place else, we didn't have any resources to use. I did have a book that I'd used in Mexico, Cox and Atkins, *Agricultural Ecology*, published in 1979.¹¹ I used it the last year I was in Tabasco. I used it for the first couple of years I was up here. It didn't use the word agroecology, but at least it talked about how ecology and agriculture could mix. It was really the only book we had for a while. I built readers that I collected things around. And over the years, more and more of what was in the reader was my own stuff that I'd published, but with the copyright requiring me to pay royalties to the journals that had published my articles. The cost of the royalties was pushing the cost of the reader way up, and I just began thinking well, gosh, why am I paying?

Reti: Paying royalties for your own work. That's crazy.

Gliessman: That pushed me in the direction, finally, of getting my own book done. Everything is there. I don't have a reader anymore. But that was a multi-year process in itself.

Reti: I want to talk more about that later in the interview.

Gliessman: But anyway, Kay and I got together, and what we thought about was, well, let's go to Heller and see if he will come forward with some more help.

Reti: What was Kay's position?

Gliessman: Kay had been hired as a grant writer for some of the other faculty in environmental studies. I think she had written some grant proposals for Jim Pepper¹² and for a couple of the other faculty. They'd hired her. Grant writing was something she had an incredible skill to do. She could integrate ideas and concepts, and frame them, and present them, one of those rare people with that capacity. And could meet deadlines better than anybody else I ever knew, and always had things right up to the wire on stuff and got them done.

Alfred Heller

So we met with Heller. At that time they had just hired a new development officer, I guess that's what he was called.

Reti: The Heller Foundation?

Gliessman: No. Our campus. Dan Aldrich. And Dan, whose father was Dan Aldrich, Sr., and had been the vice president of agriculture, had been the dean of agriculture at [UC] Davis, had been very much involved in international

agricultural development. Well, when I started talking about going to talk to Heller, we went to Dan Aldrich, Jr., who was the development director. He came to the Farm once with me and Kay, and we talked about what our vision for agroecology could be—linking it to students, doing research, finding alternatives to conventional agriculture. By this time, the beginning of the eighties (that was actually 1981, beginning of '82), conventional agriculture's problems were beginning to become pretty evident, and there were the beginnings of a movement to do something about that. So he got excited about the idea of agroecology, Dan did, and consulted with his dad, who was very skeptical, to say the least, but also had reached an age himself where he was seeing that a lot of the stuff he'd spent his whole lifetime promoting weren't giving the results that he had hoped for. I'll come back to that.

So we scheduled a meeting with Alf Heller to present him with some ideas. I hadn't met him yet. He wanted us to meet him in San Francisco. The place where we were going to meet was the San Francisco Stock Exchange Club. The Heller family has been around San Francisco for quite a while, and are part of the network of Jewish families who have been in that San Francisco region for a long time. In fact, I found out that there was even some connection back to an uncle on my dad's side who was part of that whole group as well.

So I remember going up to San Francisco. We were going to meet Heller for lunch. Dan was going to go, and Kay was going to go, and I was going to go. I'd never been in a place like this. I had been living outside of the country for ten years. I don't even think I owned a tie. I did have kind of a nice leather jacket that I wore. We walk up to the *maitre d'* who was at the little podium at the entrance

to the Stock Exchange. Big wood doors with gold handles and all this stuff, closed. I'd see them open, and I'd look in there, and there would be cigar smoke, and all these people sitting around in big fat plush chairs. Then the doors would close again. Finally we got up to the guy and he looked at me and he says, "You can't come in." I said, "Why not?" "You don't have a tie on." I said, "I don't *have* a tie. What are we going to do? We have a lunch date in there."

Reti: Oh, God. (laughter)

Gliessman: He looks at me, and he reaches down and opens a drawer, pulls out a tie and says, "Go in there and put that on."

Reti: (laughter)

Gliessman: (laughter) So I put this tie on and got in the door, and met Alf Heller. We sit down, and started talking, and he was asking some pretty pointed questions about who I was and what I'd done. I began talking about my experience in Mexico, and agroecology, and the ideas I had about using agroecology to build a program that we could use to research and train people to move in the direction of alternative agriculture, especially organic. I'm noticing him looking at me with his eyes getting bigger all the time. Then he leans over to Dan Aldrich (I guess he'd met him in the past), and he said, "Where did you find this guy?" I guess the things I was saying were the things he had wanted to hear, and had never heard from a university person. He got excited. I just started telling my story, and painting a vision of what I thought agroecology could be. And he started getting excited and got involved. He said, well, we could do this and we could do that. "We've got to find somebody to help you do this. I know

someone we can talk to. I know Huey Johnson.” (Who was at that time the Secretary of Resources for the state under [Governor] Jerry Brown). “We’ve got to get together with him. You’ve got to talk to him.”

Reti: Amazing.

The Environmental License Plate Fund and Agroecology

Gliessman: (laughs) He gave us at that point another fifty thousand to help get things going. And again, it was intended to help leverage other support. But he also set us up with Huey Johnson. We met with Huey, and at that time they had just started a couple of years before, the Environmental License Plate Program, monogrammed license plates. That was a program started under Jerry Brown to generate funds to help the California environment. You could get a custom license plate. You paid, I don’t know how much, ten bucks, fifteen? I think it’s twenty-five bucks right now, not a heck of a lot more than what it was then. But all those funds were supposed to go into promoting things that would improve the California environment. I think some of it had gone into some of Jerry Brown’s ideas of solar and wind and electricity, maybe Solar One down in Mojave, and the big windmill that was at Pacheco Pass for a while, and a couple of other things that he’d done.

But nothing had really gone into agriculture. We sat down with Huey and explained the whole idea of the Agroecology Program, and the need for a lab, and the potential that a program like this had for developing practices and understanding of how to farm in some other way than conventional. There had been no sign, of course, of anything like this happening at Davis, or at Berkeley,

or Riverside. He got pretty excited about it, and asked for a proposal. So Kay Thornley and I go to work, and we came up with a proposal to build a lab, to provide salaries for the apprentice staff, and to begin the whole process of building the Agroecology Program here on campus. That first year, I guess it was '82, the end of '82, we got a \$370,000 grant from the Environmental License Plate Fund. Two hundred was designated for setting up the infrastructure and the salaries and everything, and the other was to build the lab.

The lab was designed (this is where Jim Pepper came back in), his design class. Several students got together and they designed a green lab, with solar heating, passive cooling, energy efficiency, all kinds of good stuff, yet it was meant to be a lab.

And then, here's where a little bit of politics came in. Dan Aldrich knew we were doing this, but all the negotiations were directly between me, and Kay, and Huey Johnson. It wasn't between the university and them. I went direct to him. But I also remember that we didn't just get the grant. Huey Johnson couldn't make the decision. It had to be a legislated decision. All the money had to be approved by the legislature. Sam Farr from this district was in the Assembly at that time.¹³ [John] Vasconcellos was another one who was there. But at first pass, in review in the Resources Committee, it was a draw. It didn't pass, our proposal. I think it passed in the Assembly where Sam was, but it didn't pass over in the Senate. So we had to have a conference committee. I went up there several times and testified before the committee about the need for an alternative agriculture, and water pollution, and soil erosion, and the need to improve farming practices. And finally, I think it was Vasconcellos, actually. He was in the Senate at that

time, and he was the deciding vote. We ended up getting approval, and that's when it came back to the campus.

Reti: Now can I just stop you for a second? What was the nature of the opposition in the legislature?

Gliessman: A whole lot of conventional agriculture people saying that it wasn't necessary, that it was misguided, that Davis would take care of the problems. And what does [UC] Santa Cruz know about farming and agriculture?

Reti: Did they know about the Chadwick farm?

Gliessman: Oh, maybe. I don't know. That never really came up. That wasn't the issue. It's just that Santa Cruz was Santa Cruz. Maybe there was a little bit of that remnant stuff that they were—

That makes me think of some of the first impressions that I first got from some of the people when I stepped onto the Farm. It wasn't all positive. There was some real hesitation, some real resistance, and a couple of times almost outright hostility towards the idea of science (and that's what agroecology was perceived as being when I used the word), that it had a role to play. It was more of a—you accept it or you don't. It's more of a personal, spiritual connection, something that you're committed to doing. "We don't need to research it. We don't need the science. The science is— That's why we're in the problems that we're in today. It's *because* of science!" And Chadwick— That's what Chadwick believed too!¹⁴
(laughs)

Reti: I know.

Gliessman: I said, “Well, I’m a farmer. I farm. I understand what farming is about. I’ve tried farming organically and I believe in it. But I think we can improve it. We need to understand the mechanisms, the processes. We need to put some solid science behind it and use that as an argument with that other science.” There was a lot of resistance.

But when we got the chance to get these funds, I remember that suddenly the word comes down from the state to the campus that these funds could be made available. I still don’t understand all this stuff. I spent so much time either at the state legislature in Sacramento, or in the halls of UCOP [University of California Office of the President] in Berkeley (they were in Berkeley still at that time, right there at the base of campus). There was reluctance on the part of the university to accept these funds. I don’t know where that came from. I could go off into some conspiracy theories, but I won’t. But there was real resistance on the part of the university to accept these funds. Because it didn’t make sense to them that funds of this amount, \$370,000, with a chance of continuation funds of a significant amount for many years, [should come to the Santa Cruz campus] when there was Davis, when there was Berkeley, when there was Riverside. So I think that’s where a lot of the resistance was coming from.

But this was also the time when UC had been sued by the California Rural Legal Assistance organization for misuse of Hatch Act funds to develop the tomato harvester.¹⁵ Bill Friedland had a lot to do with that as well. I think right about that time the suit was before the judge, and the decision was about to be made, and it didn’t look like it was going very well for the university. And part way into this, the university lost. They scrambled, from what I could tell, to

demonstrate that they *were* interested in small farm systems, they *were* interested in farm worker health and safety and alternative farming systems. And in some way all that's connected, and they allowed this thing to kind of go through.

Reti: What timing.

Gliessman: But then it came to our campus. And our own campus, largely I think because of the animosity that had developed over the years between Chadwick and other folks on campus, especially the administration, especially some of the very scientists that he had attacked so severely (laughter)—they didn't want to accept the funds here either. There were lots of questions back and forth. But they had to accept the fact that I was a faculty member, a new assistant professor, and that I was supporting this, that I'd submitted it. I remember being called before the [UCSC Academic Senate] Committee on Planning and Budget, and the chair of the committee at that time asked me, after I'd answered some questions about what agroecology was and what it would do and all these things, he looked at me square in the face and he says, "Are you willing to stake your *career* on the Farm and Garden?" I said, "Yes." He said, "Okay, we'll approve it." (laughter)

Well, after we got the first \$370,000 it had to be, what do they call it, encumbered immediately because there was fiscal year and a closure in the Senate at the legislative level. They had to encumber it all, or they'd lose it. That's when the whole issue about the lab on the Farm came up. It had to have electricity. There was no electricity on the Farm. And you can't have a lab without electricity. So I started talking to the folks at the Farm about bringing electricity to the Farm.

And man, did I step in a hornet's nest. They did not want it, most of them. But fortunately, Jim Nelson and Dennis Tamura were okay with it. They understood that we needed to move in these directions. God, some of the discussions we had, some of the shouting matches that ensued— Oh! Anyway.

Reti: So for them electricity symbolized a whole direction that they didn't want the Farm to go.

Gliessman: Yes. Well, is there much electricity at the Chadwick garden?

Reti: No.

Gliessman: That one has retained its character, and that's not an accident. But we got it in. When all the heavy equipment came and they started trenching and moving all that stuff in, boy, there were some angry people, to say the least. But salaries were being paid.

Then we started into the second year of the funding, and I get a call from Huey Johnson saying, "Hey, this is the end of this four-year period for Jerry Brown." I think the election happened. Deukmejian won, and the Democrats lost and Deukmejian moved in. Huey Johnson said, "We've got to act fast." His plans had originally been to continue to stay in office and continue funneling money. We had plans for a big center, a building. You wouldn't believe some of the stuff we talked about. We're talking a million and a half, two million dollars a year. All of a sudden that dried up. But we still had two hundred thousand or so that was earmarked for the Agroecology Program. That's when I started spending a lot of time at UCOP with the Office of Finance and others, going back and forth about

the program, and the funding, and the work we were doing, and proposals, and all this sort of stuff. That was just before the appeal on the judgment about the Hatch Act funds. And some way or another the two hundred thousand that had been transferred from the legislature to the University of California, through the president's office (actually through the vice president of agriculture's office, not through the president's office), through DANR (Division of Agriculture and Natural Resources), became established as a permanent pass-through from the legislature, to the division, to the campus, to the agroecology program. I don't think anybody even knows this history anymore.

And we ended up with a permanent budget line, a permanent line item through the university. That's survived to this day, although it's being chipped away at. There was a big time when the whole Division of Agriculture's budget was cut. Well, ours got cut, too, but it's continued to exist. And there have been other politics, and stuff I've worked on through the Division of Agriculture, and I'll come back to some of that.

Well, then the appeal came forward, and the ruling was reversed in favor of the University, largely on academic freedom arguments— That's when support began to dry up a little bit. But the politics of sustainable agriculture had begun to mobilize. Miguel Altieri had his position at UC Berkeley. He came about the same time I did and started to make noise about agroecology, and teach classes up there. And other folks outside the UC system started to make noise—a guy down at Cal Poly Pomona, people in the nonprofit sector, CCOF [California Certified Organic Farmers] started to form; Eco-Farm started to happen. I remember going to some of those early Eco-Farm meetings when they were still

up at the YMCA camp up there at La Honda.¹⁶ Small, kind of little groups. Lots of energy. Good stuff going on. Two or three of us would be there as the only faculty from the University of California.

So by 1985, a group had put together a proposal to create the University of California Sustainable Agriculture and Research Education Program, UC SAREP, through the state legislature. Senator Petris from Alameda County, through his office, here he was basically in an urban county, but put a proposal to create a sustainable agriculture program in the University of California. The politics of that were pretty fascinating.¹⁷ I was asked to be on the UC systemwide committee to explore its development and respond to the proposal that was being made by this senator. It came from his office and some of his staff. I talked a lot to their staff while it was being developed. It was really exciting, this stuff that we had been struggling on for three or four years, getting the Agroecology Program started, and we became one of the main voices for it.

This is where the name Agroecology Program [came from] and I got named the director. We were able to have a voice. That voice was about change in agriculture, not just about maintaining the facilities we had here. It went way beyond that, as we really became part of a larger movement. They created the program through a state bill, but it didn't have any funding attached to it. It was a program that the legislature required the university to start, but it didn't give funding to start it. The reason it didn't get any funding was politics, totally, from the more conservative Senate and Assembly folks who represented the conventional ag structure. But again, the university, trying to show that it was willing to be innovative and creative, named a committee that was heavily

dominated by the folks at Davis, but some of the others of us were able to be in there, and created some funding out of the vice president of agriculture's office to support it, to provide a director's salary and an initial grant program. It was like \$200,000. But that was a start.

Reti: So systemwide they were giving less money than you actually had just here at Santa Cruz.

Establishing the Alfred Heller Endowed Chair in Agroecology

Gliessman: Yes. Well, the other thing that happened at the end of 1983, after we'd gotten this initial funding from the state license plate fund, and the initial donation of the \$50,000 from Alf Heller (I think it was either at the end of '83 or the beginning of '84), we decided that, and especially since they'd cut off and reduced the amount of funding but we still wanted to grow the program, with Dan Aldrich and Kay we went back to Heller with an idea. He wanted to keep helping but he wanted to do it in a way that would leverage more support for agroecology. What he really wanted was for the university to create a faculty position to work alongside me. But we couldn't do that. You can't tell the university to hire somebody in a particular area. It all has to be internal. A crazy system. It's so hard to do that kind of stuff, especially in a diverse department like ours where there are so many points of view and it's hard to get everybody to agree on one thing. Like herding cats, as they say. But we went to him with an idea, and that idea was an endowed chair of agroecology. Because we felt that it would call attention to the field more than anything else, open some eyes, especially since at that time there were no endowed chairs on the UCSC campus.

Reti: Really? I didn't realize this was the first one.

Gliessman: So he agreed. \$375,000 in an endowment. And boy, did it open some eyes. The thing he did get was naming me to occupy it, even though I was an assistant professor, which was kind of unheard of.

Reti: Yes, I bet. Because you didn't have tenure yet, right?

Gliessman: No. And voila! It was created. And that chair—people probably don't know what it means, or how much it is, or how much I get from it. I get some interest off of it every year. It started out at probably generating about \$15,000 a year. But the best part about it, being the chair holder, was that it was discretionary funds that I could use. I used it for all the little things that you can't get grants for, that are so hard to get grants for. I didn't have a startup budget. I didn't have a regular research budget or anything. I had to generate everything. This finally gave me that little bit of leeway so I could pay an assistantship to a grad student, or buy a piece of equipment that we needed for research, or travel to a conference to speak about agroecology. Over the years as the corpus (as they call it) of the endowment grew, and it had the ability to generate more interest, but it's still affected by the stock market because it's invested in those kinds of things. But just because of the size—it's over a million dollars now in terms of total principal, and it generates around fifty, fifty-five thousand dollars a year, up and down a little bit. Which has been totally key. I've talked to Alf about this, how important over the years having that discretionary fund and being able to direct it towards building agroecology, it's unbelievable how important that's been.

Reti: Yes, without Alf Heller this wouldn't have gotten very far.

Gliessman: But we never hired that person that he wanted, and he's always been angry about it. It could have been very easy to do, but it never happened. We came close. We came close over the years through the Gene Cota-Robles UC Target of Opportunity Fellowship. They get support for a year or two and then we offer them a position if everything goes well. We ended up with Marc Buchanan. That was in '93, I think. In '94 I finally took a little break, and turned the directorship of the Agroecology Program over to him, thinking that he would be trained and doing that, and then I could step back into a support role, rather than having to be the director, which I'd been for twelve years, thirteen years with no salary. Because I just took it on. I took on the directorship with no salary because I was one hundred percent environmental studies. And for the whole time I did it, that's what it was. I did the directorship plus a hundred percent time. Maybe one time I took a tiny bit of summer salary out of the endowed chair, but I never used any of it for my own salary. I used all of it for all of the aspects of the program, which I still do today, not so much to support CASFS, but to support agroecology and all the things we do to build it, and continue to grow it, and effect change with it.

Then it didn't work out for Marc. There were all sorts of interesting issues. I don't know how much detail to go into of twenty-five years, twenty-six years of back and forth, support and then no support. And being inside and being outside.

Reti: Well, there is nobody else really talking about that time period here.

Gliessman: Maybe I ought to just go year by year, and we'll see what comes out of it, rather than jumping ahead.

Building the Program in Agroecology

Back to the end of '83, '84, when Heller created the endowed chair. It was pretty exciting. And connecting that with the development of the Agroecology Program, and the growth of the concept, why, we made a name for ourselves. We had the apprentice course as a practical piece. We had the courses happening—with agroecology and a course on sustainable agriculture and an integrated pest management course starting up, a couple of things like that that were the beginnings of a curriculum in agroecology, just the beginnings. And then lots of students beginning to do internships, and thesis projects. All that stuff was starting to happen.

And then after we got the lab— Oh, God, that lab got built in just a few months. It was really phenomenal.

Reti: (laughs) That wouldn't happen now.

Gliessman: (laughter) No, I'm afraid not. The architects did mess it up, the campus architects. They couldn't call for a complete redesign, because there wasn't time. We wouldn't be able to encumber the money, and we'd lose it. And they never want to lose money. Rarely. Sometimes. So they had to go with the design, but did some major modifications to orientation of windows, and they eliminated some of the big plenum system that we wanted to put underneath the building to bring up air and flow, because they said it was too expensive, it wouldn't fit the budget and all that. They were probably right. But it ended up

losing most of the green stuff. I think that building ended up being built for less than \$140,000, which even at that time was unheard of. We threw it up pretty fast, and it worked pretty well. And that's when I—since environmental studies didn't have a grad program—went to biology and asked for some way of being able to have grad students through them. An interesting thing was set up. They said, "First of all, you're not tenured, so you can't sponsor Ph.D. students."

Reti: You can't be on a dissertation committee.

Gliessman: "But we'll do something. Even though we don't have a master's program, we'll let you have master's-level students." Because they gave master's degrees, mostly for folks who never finished their Ph.D.s. They said, "Well, we'll let you do that, and you can give them a master's. But you also have to have a co-advisor in biology. You can't have them by yourself." Fortunately, Jean Langenheim in biology was supportive. And that goes back to the days of me being a graduate student with C.H. Muller down in Santa Barbara. She and C.H. were good friends. She'd done a little work on allelopathy when I was a grad student, and out of respect for C.H. she opened up and said, "Yes, I'll co-sponsor with you." We, over the years, had some fun working together with students on stuff that was of interest to both of us.

Reti: Great.

Gliessman: She was pretty remarkable, still is. And that's when, starting in '84, I was able to accept seven or eight master's-level students. Three or four of them were from Mexico, folks that I had worked with previously when I was down there, or knew through contacts when I was down there, and three or four locals.

We began our research program in agroecology, doing some fun stuff. One of those master's degrees was Marc Buchanan doing some initial soils work. Another was Francisco Rosaldo-May, who today is the chancellor of a new university in Southern Mexico. Another was Juan José Jiménez, who did his master's here, and then went on to do his Ph.D. at Riverside, and now directs a conservation and agroecology program at the University of Mérida in the Yucatán. Another is Octavio Ruíz-Rosaldo, who had been one of my undergraduates when I was teaching at Tabasco. He's now director of a tropical agroecosystems program at the Postgraduate School of Agriculture of Mexico at their campus in Veracruz.

Then, when I got tenure in 1987, Biology finally said I could have Ph.D. students. But I still had to have a co-advisor. I couldn't do it on my own because I wasn't a full-time member of their department. Jean stepped forward again. (laughs) Francisco went on to do his Ph.D. jointly with us, which he finished in '91. And I brought in a couple of other students, Martha Rosemeyer, and Ron Kluson. And then brought up another student from Mexico, Judith Espinosa, who, partly for language reasons, struggled and ended up settling for a master's degree, and then she went back to be a teacher at the University of Tabasco in Villahermosa.

Reti: Was there funding to bring students here from Latin America?

Gliessman: At that time there was a little bit, and [this is] where Eugene Cota-Robles became so important. He became a co-advisor on several of my Mexican students, and helped us find funds to support them, with especially their non-residence tuition, which wasn't as much as it is now, but still was a significant

amount of funds. I'd get them up here, and they'd learn their English, and struggle with it all, and find funding. Sometimes it was funding from their home institution. Sometimes it was funding that we found up here. But it all kind of worked.

Conversion Studies: Research with Jim Cochran on Organic Strawberry Production

And then when SAREP got started (that's a whole other story), [we] started our research, started our conversion study program in 1985, where we got some funding to work with Jim Cochran of Swanton Berry Farms¹⁸ when he was just getting started himself. That is another story I'm thinking of writing up, how we've worked together for over twenty-two years now.

Reti: Oh, yes. That's a really important story.

Gliessman: Meeting him over the back fence. I was living at that time over in—

Reti: Oh, you were in Molino Creek then?

Gliessman: Gosh, I forgot about that.

Reti: We need to talk about that too. (laughs) This is why we're going to do so many interviews.

Gliessman: (laughs) Oh, gosh. There's the personal side, and there's the academic side, and they're all interwoven.

We started the conversion studies, and put in a proposal at the end of 1985 to the SAREP program for \$25,000 to set up on [Jim Cochran's] farm a comparative

analysis of conventional and organic strawberries, side by side, on a piece of ground that had been farmed conventionally for a long time with Brussels sprouts. That was one of the first major, whole-systems kinds of studies from an agroecological perspective, of that transition process. Because, organic strawberries—you can't do it. That's what we were told: "There's no way." Jim said, "Well, I'm going to do it." I said, "Well, I'll work with you on the research side to understand how to do it, and help develop the technologies and the practices we need in order to make it work."

So all of the grad group—it was such an exciting time, even though they all had their own individual projects. Francisco was doing a study on allelopathic interactions between mustard and sweet corn, and Rob was doing studies on the effects of cabbage and bean intercrops on mycorrhizal nitrogen-fixing bacteria in the roots. Martha was down in Costa Rica looking at the traditional slash-mulch system that I told you about. She got in and did the ecology of that system. And Judith was looking at allelopathy between weeds and beans. Everybody was doing different things. But they all became involved doing parts of the conversion study, as kind of like a sideline. Several of them, their names are in the publications that we've taken from that. It's like they did two theses, their own and the work for the strawberry stuff. Gosh, it was a lot of fun! That lab was just hummin' and buzzin' and they were doing research and we were squeezing the labs for the undergraduate agroecology class (Environmental Studies 130A/L) in there in the fall, and (laughs) it was a pretty exciting time as we began developing a research foundation, a research protocol for agroecology. That all reached its culmination in 1990, when we published this book [reaches

for a book]. That's the first thing of a major level that we published here and it's really kind of a—how do you do agroecological research. It was kind of fun.¹⁹

Reti: So nobody else was growing organic strawberries anywhere. Was Jim Cochran the first to grow strawberries organically on a fairly large commercial scale?²⁰

Gliessman: Yes. I've talked to him recently about writing up this story. Because we did the comparison. For three years we got funding from SAREP. It wasn't much, \$25,000 to do a whole systems study with all the things we looked at. If we hadn't had this team of people working together, and undergraduate students working on it as well, we would never have been able to do it. Because we just couldn't get funding from the USDA. We couldn't get funding from all the major sources. The Strawberry Commission would just laugh at us if we went to them for funding. So we had to do it on our own.

At the end of '88 we wanted to publish the first year of the study and put it in *California Agriculture*. It took us almost three years to get that manuscript approved. It kept getting ripped up, and sent back, and criticized. But we finally did get it published. It got published in 1991. But then at the end, in 1990, when we'd finished the first three years of the study and we wanted to keep doing more, we did a whole summary study. The first year was kind of interesting. It just showed that, yes, you could grow them but it was at thirty-eight percent less yield, and if it wasn't for the premium price it would have been a bust financially. So they let us publish it, because it didn't make a lot of waves. But by the third year, we'd begun to show that not only was it economically viable, but

there were all sorts of redesign issues that needed to be taken care of in the way that strawberries are farmed in order to make it work in a long-term way. It was pretty critical of a lot of the conventional approaches, and providing pretty good evidence that, yes, a farmer could do all right and the system could function. Boy, did they not want to hear that! Because when you show positive on the one side, you are negatively affecting the other, or implying that what they're doing isn't sustainable.

Reti: Was methyl bromide already in the news at that point?

Gliessman: Yes. It was really starting to come into the news. In fact, yes, it was somewhere right in there that the Montreal Protocol came out.²¹ I think it was halfway through that study. And by the end, boy, we were right out there and visible. By that time, too, we were developing a protocol for the conversion process. We were beginning to realize that the first step, for us anyway—I guess the conventional agriculturalists were under criticism for excessive use of pesticides and all, so they are struggling to improve their systems. Integrated Pest Management was an attempt at that. By knowing the life cycle of your insects you can know when to apply the chemicals better. So you use less and you have fewer negative impacts, but you are still using the chemicals. That's important research. A lot of that is still going on in the conventional-ag setting. We call that the first level of transition. Rather than just wanton calendar spraying, at least they are trying to change it. Or excessive fertilizer use, or over-watering, or whatever. There are a lot of ways to improve the conventional systems so they do function better.

Well, we, with our conversion work with Jim, were going to a second level of replacing the conventional practice, or the conventional chemicals, with an alternative. Since Jim was moving into the organic market, and there existed the CCOF norms for production, that was the norms we used for that transition to organic. But all we were doing was substituting inputs and substituting practices. We really weren't changing the system. It was still monoculture strawberries. And we weren't looking at the social issues around the system.

Reti: This was before Cochran got involved in the labor issues.

Gliessman: Yes. But see, we were understanding ecologically the system. And the whole time we were doing those studies, doing the second level of research on the substitution part, we were constantly working with Jim, and saying, "Hey, look what we found. What do you think? How do you want to use that? How can we improve the fact that we're losing—" We put on too much nitrogen and we've got too many leaves and not enough fruit, or the temperature of the soil isn't high enough under the black plastic that he was using versus the clear plastic that conventional uses. What do we do to change that? What do we do to control mites, because we can't use miticides? Let's try releasing beneficial mites. Just that story, how we found out about a predatory mite that you could buy, that was being used in greenhouses in Holland, but had never been used in the field on strawberries— We didn't know how much to put on, when to release them, how to get them. We had to find out all this stuff, and work with Jim all the time in the process of figuring it out.

Meanwhile, the conventional guys were telling us that we were going to lose the whole thing. And it did work. We developed a protocol for releasing these critters, and showed that it could work, and it needed to work without the background of pesticides that would have killed the predatory mite in the first place (that's why nobody had ever worked with it). The first year we used 80,000 of them per acre, and then we reduced it to 20,000 the second year as we figured out better when to release them, and how to do it and all that stuff. Today that's what everybody uses. Even the conventional guys are using them. And there's local production of them now. They're not being produced in Israel and then being sent to Holland, then coming over here in little bottles from Holland, as they were when we first started doing it in 1986 and 1987.

Reti: How did you find out about the mites?

Gliessman: At that point, it was the beginning of 1987, I hired Sean Swezey.²² He's a darned good entomologist. He's incredible in his understanding and knowledge of biological control and natural control processes, and had been working in Nicaragua for a long time with crops down there for four or five years, helping them develop alternatives to pesticides. He was the one who knew about this stuff. He started looking at the mite and looking at what alternatives we had. The first year I thought, well, once we stop spraying, all the beneficials will come back, right? Well, they didn't, at least not in numbers big enough. That's when he said, "Hey, I know about this one used in greenhouses. Let's try and get it and use it." Biocontrol people think about that. The classic biological control is: find a beneficial and release it in your system. That's the way they do

stuff. They go where they can to find those critters, and he knew how to do that. That got us into it.

Reti: So now it's had international impact.

Gliessman: Yes. As our program developed and we continued to work with Jim, we began to realize that we couldn't grow strawberries permanently year after year on the same piece of ground, with organic production. We were going to have to go back to some modification of the pre-methyl bromide practice of growing strawberries for a year or two or three, and then rotating out of strawberries to something else for six to ten years before coming back with strawberries again.

Reti: Why was that?

Gliessman: Disease build-up in the soil. It takes a long time, once you've got them, to knock them back down again without methyl bromide. And biological processes aren't as efficient on those disease organisms. So again, we could go off and talk about all of the trajectory, but what we began to realize is that level-two substitution focus isn't enough.²³ We had to think about redesigning the system. And this is where ecology became such a key piece. We had built quite a bit of understanding about ecosystem structure, and relationships, and processes that maintain that system over time—nutrient cycles, energy flow, population-regulating mechanisms that balance the organisms and make all that stuff work, and how dependent it is on the structure of your system. And if you've got a monoculture, you're missing, lacking most of the structural components that

provide that dynamic. In a sense, a rotation is a change in the structure of the system. It's not just strawberries. You've got something else there for a while.

Reti: You've got one plant occupying that whole niche.

Gliessman: Right. We've since moved into lines of work where we are talking about intercropping with strawberries, bringing other things into the system even while the strawberries are there.

Reti: I was reading the bulletin boards outside your office about alfalfa.²⁴

Gliessman: That's the example. And it's going to go even beyond that. Jim has been the classic example, in how he's learned how to do that—how he's learned how to develop rotations, cover cropping—which crops harbor the disease organisms, which ones actually inhibit them. He's connected it to the social side, because part of the reason why he had to diversify, too, was in order to have work crops for his crew all the time, all year round, rather than just seasonally, like he had with just strawberries.

Reti: Right. Otherwise you just use people for the season and then get rid of them.

Gliessman: Rather than making them a permanent part. And then he's gone on beyond that as the social piece starts coming in.

Bringing the International Federation of Organic Agriculture Movements [IFOAM] Conference to UC Santa Cruz

I remember in 1984, the International Federation of Organic Agriculture Movements, which had started in Germany and had spread through Europe, and was just starting to get into the U.S.—they had an International Scientific Conference in Organic Agriculture.²⁵ I have the proceedings in my library. I decided to go to the international conference, which was held in Kassel Witzenhausen outside of Kassel, where a couple of the key people who started IFOAM were also teachers.²⁶ It was a pretty neat meeting at a time when organic was just really starting to gather some impetus. Around here CCOF was up and running pretty good. Eco-Farm was starting to happen. Here's this international group trying to promote organic on a global level. Yet all of them were folks that had come out of that grassroots organic movement. A lot of them were small farmers themselves, representing communities of small farmers and consumer groups, just bringing in a few people who had ventured into it from a research perspective. I went to the '84 meeting, and heard the stories, and saw the research fields at Kassel, and talked to the founders of IFOAM, and when the proposal came up for holding the '86 (it was on a two-year cycle) meeting we said, "We'll do it."

Reti: (laughs)

Gliessman: (laughter) Without knowing exactly what it was going to involve. And we did. We put it together. A year or so before that, or about that same time maybe, we'd hired Patricia Allen.²⁷ I'd hired her (anyway, I thought I had) as our

outreach coordinator, a person to really outreach the concepts of agroecology beyond here. That was my thought when we hired her. She probably has a different story. That was her first big job, to help organize that IFOAM [International Federation of Organic Agriculture Movements] conference. And boy, it was a lot of work. I hadn't done anything like that. I had done it small-scale down in Tabasco, and it had worked pretty well. So I guess I'd had that experience.

Reti: Oh, the symposium.

Gliessman: Yes, the symposium

Reti: But an international conference?

Gliessman: Yes. We put out the word as best we could, using whatever information technologies we had at the time. We ended up having five hundred people show up from a whole bunch of parts of the world. We used Crown College to house people, and rented spaces around campus. We used the Merrill Dining Hall, and rooms scattered around campus for meetings, and field trips. It was great. It worked well. The proceedings of that meeting, I think, are still a pretty remarkable collection of thinking about organic and beyond at that time, lots of different perspectives from all over the world, and where it was. It would be fun to go back and review that document.²⁸ We kind of published it ourselves, so it never had a very wide distribution like a lot of proceedings of things do. But I've always thought of it as a pretty neat thing. It put us on the map, in many ways, as a center for work on organic, number one, but agroecology as well.

Reti: We've been listening to some of the oral histories done by the Alternative Farming Systems Information Center at the National Agricultural Library, and some of the folks that they were interviewing at that time, even Robert Rodale, he mentioned that conference.²⁹ That's how I knew about it, sort of circuitously, not through UCSC.

Gliessman: Neat. No, UCSC didn't say much about it. There wasn't much actual involvement of anybody beyond our group, from the campus itself, although I do remember that Nancy Abrams came.³⁰ We invited her to come. She composed a song and sang it at the conference. And Frances Moore Lappé came from Food First. *Diet for a Small Planet* hadn't been out very long, and she came and was a featured speaker. Gosh, we had a great crew of people come and take part in it.

Reti: You have copies of the conference proceedings?

Gliessman: Yes. We do. But boy, it was so much work that Patricia said, "I am not doing that kind of stuff anymore." That about burned her out, I think. But it was worth it in terms of the step forward we made.

Teaching the Organization for Tropical Studies' First Two-month Field Course

About that same time, something we shouldn't forget, in the summer of 1985, while everything else was going on, I accepted an invitation from the Organization for Tropical Studies to coordinate their first two-month field course in tropical agroecology in Costa Rica. It had never been done before, so we had to build it from the ground up. It was an opportunity to bring together the

network I was connected to in tropical agroecology, which included everyone from Miguel Altieri, to John Vandermeer, to Ron Carroll, to Steve Risch, to Bob Hart, to a whole bunch of other people who were a growing network, people who had been doing ecological agriculture tending into agroecology, starting even way back when I was starting to farm in Costa Rica, the network that I had built relationships with.

That was a pretty amazing event, for a lot of different reasons. Being able to consolidate thinking in tropical agroecology like we did.

Robbie Jaffe [part one]

It's also where my relationship with [my wife] Robbie [Jaffe]³¹ flowered, because she was part of that master's group, although she didn't do her master's through biology. She did it through education. She worked with Art Pearl.³² He and I were her co-advisors on her master's thesis. It had a lot to do with using conflict in sustainable agriculture as a teaching tool.

Reti: Conflict among the different groups, parties?

Gliessman: Yes. Among the different parties—conventional, organic, alternative. She organized a course that I was teaching. I kind of turned it over to her, and it became her master's project, on principles of sustainable agriculture. Of course it's evolved into other things today. She used it as an opportunity to bring in all the different points of view around what is sustainability in agriculture, and engage people in conversations and exchanges. It was a wonderful course.

Reti: Oh, she would be so good at that.

Gliessman: Yes. That was her master's thesis. She described that. She finished that, right at the end of '84, first part of '85. Or maybe she was destined to finish it at the end of '85, in June. She asked me when she found out I was doing this course in Costa Rica, if I needed a TA or something. I had had this great experience working with her on her master's thesis, and I knew she was more informed on some of the bigger issues, especially on the social side, than I was, because that was her background. And she brought that to the course so well, and was so good at building group dynamics and interactions, I thought, God, that would be a good thing to have in the course. So I agreed. She came down as the primary TA and became a co-organizer, in many ways, of the course. We have a course book. That's a book in itself that captures all of the stuff that went on during that course. That's a pretty neat thing as well. We did all sorts of stuff showing how you do agroecology, and I think some of the earliest attempts to show how you take agroecology and put it in a social context and talk about, not just the ecological changes that need to occur, but the social changes that need to occur as well.

Reti: Boy, these are things that really need to be archived in the library, if they aren't already.

Gliessman: Yes, one of the fascinating things about my library is that it's a mixture of stuff we were producing in the gray literature as we went along, and also the pieces that were published in the regular literature that supported that.

Reti: What's gray literature?

Gliessman: It's all the stuff like symposium proceedings, and course reports, and bulletins, all that kind of stuff. I never throw anything out. I've got a whole room that's got bulletins and brochures and stuff from organizations working in agroecology starting from even before I came here, stuff that I brought with me from Mexico, to the present. It's kind of fun.

I recognize the impact that Robbie has had on me over the years, in that she has that social perspective, that community-based perspective that is so critical, and has flowered so well with CAN [Community Agroecology Network.] Gosh, it's just kind of neat to know that that's part of what we do. (I'll talk some more about Robbie later.)

The Meaning of the Term “Agroecology”

For me, always when I say “agroecosystem,” it's as much the people and culture, as it is the crops and the soil. But when I say that word to a lot of people, all they hear is the ecosystem part. They don't see it as a social term. “Agroecology Program”—they didn't see it as a social term. Which is why when I was asked to step down as the director of the Center (well, the Program, it still was, in 1995), immediately there was a proposal to change the name. Some of the proposals included eliminating the word “agroecology” from the name completely. Fortunately, I guess I was able to make enough noise to not do that. But the other part was added to it. It became the Center for Agroecology and Sustainable Food Systems.

Reti: Which implies that the word “agroecology” itself does not encompass that.

Gliessman: Right. But for me, it always has. Whatever. At that point I wasn't in the decision-making position in regards to that anyway. So, you know, off it went.

Molino Creek Farm

When I first came here, my ex-wife and I rented a house from Bryan Farrell.³³ They were on sabbatical. They lived up in the Brook Knoll area off of Graham Hill [Road]. We lived there about six months. Then we found a little place in Boulder Creek. Everybody seems to go that way first, out to the redwoods. We survived the big flood of '82 up there. I hiked home in the dark, climbing over trees and water and everything, because the buses only got me as far as Mt. Hermon, and I hitchhiked into Felton, and got another ride from there to Ben Lomond, and then the roads were washed out from there. It was dark and I hiked home from there. I got to Boulder Creek and I remember going up to the house, and the lights were still on, and I opened the door and went in. I was drenched. I said, "I'm home," and the lights went out and didn't come back on for a week. (laughs)

Reti: (laughter)

Gliessman: Along with working with Kay [Thornley] on the stuff I described earlier, on the grant writing stuff I described earlier—Kay was the one who got Molino Creek together.³⁴ She knew the owner of the land and had lived up in that area a little bit. When the owner of the land decided to sell, and she didn't have enough money to buy it, she put a team of us together, each of us contributing a certain amount to make the down payment, but with this whole

idea of forming a community committed to organic agriculture and a different lifestyle, where we grew the food together, and found local markets for it. We started doing that. After a year in Boulder Creek, we sold the house. We were part of the founding farmers of that outfit. But of course, the Agroecology Program was starting to take off too, and occupying quite a bit of my time.

And it was shortly thereafter that my ex-wife decided to exit stage left, or whichever direction. I wanted to stay at Molino Creek, and she did too. It started to get a little complicated. It wasn't easy, even under the best of conditions, having five or six couples agree on how to manage 136 acres of land. So there were issues all the time. And I just got so that I had less and less time, because of all the other stuff I was doing, not to mention teaching field quarter every spring with Ken [Norris], which I started doing the very first spring I was here after I taught the agroecology course in 1981, and building the Agroecology Program while I'm gone for practically a whole quarter every year. Yes, all sorts of interesting stuff going on (laughs) and it's still going on.

So we split up and got a divorce and I was on my own for a while, for a little over a year. That's when the course in Costa Rica took place, and during the course I hooked up with Robbie, and we got together. And that's when we both decided that we didn't want to return to Molino Creek and I asked to be bought out, and moved, at the end of '85, over to Swanton, and rented a little place from Big Creek Lumber, and got to know the McCrarys, especially Bud McCrary, pretty well during that time.³⁵ Gorgeous place. We were there almost ten years. We rented a little three-room cabin alongside the creek, and pretty soon realized it wasn't big enough for the two of us plus the two adopted sons I had from my

first marriage when we lived in Mexico. So we asked the McCrarys if we could remodel or add a room. They said, “Oh, the place isn’t worth doing that.” So we came up with a plan to actually knock it down and rebuild it, with us putting up half and Big Creek putting up half. Of course Big Creek put up the half which was all materials, which they had anyway through Big Creek Lumber. We did all the architectural stuff, got the permits, did a lot of the work ourselves and everything. We built the whole thing for less than \$70,000. Pretty nice little house. And the \$35,000 we put up, the agreement we had was that we would discount against it at \$300 a month until it ran out. So it’s like paying rent in advance. That lasted almost ten years. And at the end of it they started to charge us regular rent. We were surprised, because we thought it was our place and it really wasn’t. It was theirs. That’s what pushed us into town, and how we ended up where we are now.

But since I love to farm, obviously, because of Molino Creek, because of Loma Linda, because of all that kind of stuff, the journey to Condor’s Hope was a natural in some ways. I can tell you the story about how that happened at another time.

The Development of Agroecology at UC Santa Cruz and Beyond

Reti: Today is June 12, 2007, and this is Irene Reti. I’m here with Steve Gliessman for our third interview. Steve, let’s start today by talking about some of the culture and expectations that existed at the Farm and Garden when you came, and then how that program evolved over time.

Gliessman: Yes. I think we talked some last time about how I came to Santa Cruz after having responded to a job application from environmental studies that talked about a “plant ecologist, specialist in California vegetation,” with no mention of the Farm, and only a little tiny last sentence at the bottom of the page that said something about “experience with managed ecosystems.” I guess that was the part that gave me some hope when I had decided to apply, that they could see my experience on the natural systems side, but also see my ability and experience with managed systems. And when I sent that in I didn’t even know that the Farm and Garden existed, period.

Reti: Word of that had not reached where you were teaching in Mexico, in Tabasco.

Gliessman: No, all I had was this little job announcement, and nothing else. Of course we didn’t have computers in those days to get online and check things out. (chuckles)

Reti: True. Hard to imagine now.

Gliessman: We were lucky if we got a letter three or four weeks after it was sent. But anyway, that’s a whole different time. So when I did come up here for the interview, I made a presentation on traditional knowledge in agriculture, and agroecology as a concept. I talked about it. That was in early 1980.

But what I noticed, what I was received with when I got here, was people like Ken Norris wanting to hear about all my work with natural systems, and his hope that I would join him on Field Quarter, and knowing my background,

where I'd come from and who I'd worked with, why, he was very interested in that side. But I was swept away by students, taken off down to the Farm and shown around, mostly after I gave my seminar, which was about agroecology.

I remember just before I left, one of the last people I talked to was Ken. His question to me was if I was really willing to continue to develop my natural systems side, so to speak. I said yes, because I always enjoyed that stuff and it's fun to teach. The basic concept that I had been developing in my own mind—that nature is our model, and we need to know how nature works first so that we can then bring that knowledge into agriculture, and design farming systems on that model of how nature works—[was] something I had been developing and thinking about a lot in my formation as an ecologist. So when I finally got word that I was hired, it was with a lot of excitement, thinking that what I had been doing for almost ten years as a farmer, and as a horticulturalist and as a teacher in Latin America—that I would be able to bring that here and continue to do it. It sounded really exciting, although I didn't know where it would go, especially how it would shape up.

Getting here my first quarter, teaching agroecology right away, using the Farm as the primary living laboratory within which to teach it, and being wrapped up in the student excitement of it was really, really exciting. It just felt like, gosh, there's something here! I can remember the excitement and the response to agroecology as a way of thinking about the Farm, and not just the Farm, but agriculture in general. A lot of the students at that time, and today as well, they felt that reconnection to the land that agroecology could give them. It wasn't just a way of farming. It was a way of living and believing about how to farm, and

why to farm in a different kind of way. Not just a back-to-the-land thing. It had a bigger feel to it.

But I also remember when I taught that course at the Farm, some of the hesitation on the part of the folks who were there, non-students, the beginnings of the apprentice program, when I talked about the science side of agroecology and the importance of bringing that knowledge into what was going on there, it could go either way. There were some people who were pretty outspoken against it, and other people very supportive of it, within the group at the Farm at the time. I took it as— Well, part of it is a general anti-science feel, that we don't need the science. If you believe in it enough, or understand it enough, or are connected to it enough, the science isn't necessary. Yes, there's good farming. There's good horticulture and there're good practices. But you just need to know how to do it, not necessarily spend a lot of time doing science about it.

On the other hand, agroecology looked at how ecological concepts and principles could be used to either solve problems in agriculture, or make agriculture function better, or, in reality, change the way agriculture is done. It became very clear very early on that that's really what we were talking about. I think back to my time in Mexico, and comparing side-by-side traditional farming systems (which were essentially organic), to conventional, export-oriented agriculture built on high use of inputs, grounded in the Green Revolution, and seeing how miles apart the two were, seeing the ecology functioning in one and not functioning in the other, coming here and stepping into organic agriculture after having played with it a bit, like when we were farming in Costa Rica and having a hard time making it work in a tropical environment and making it work

without knowing how to do it, especially. But coming here, and yes, seeing the Farm, and seeing the Garden with a history at that time of, what, something over ten years or so, in different ways, having set up systems that were working. For me again, it was like the experience in Southern Mexico of seeing traditional Mayan farming systems that had been working. [I was able] to see these things working, to be able to start doing agroecology on those systems, and document and verify that there was an ecological foundation to what was going on, and begin to test ways of improving them.

Again, those principles of ecology [are] what really allowed those systems to work well, all of the ideas that ecosystem thinking brings into agroecology—closed nutrient cycles, a renewable flow of energy, balances in the relationships between the organisms that are there, and a capacity constantly to be renewing itself, a dynamic balance, not an endpoint, not a static point, but always changing and recovering and growing and evolving. Some of that had already started to come out of my relationship with Alba Gonzalez, an anthropologist I mentioned. [There is] this constant co-evolution that's gone on between people and the environment for centuries, and is always going on. We need to know how to bring that kind of constant change into the process.

These pieces were starting to fall together in a more coherent way. Although I do remember, also, early on when I talked about agroecology, when I used the word, people seemed unable to look beyond the ecology piece, the natural science piece, and think of it as something bigger. I always, right from the beginning, tried to define agroecosystems as an ecological and human interaction. You couldn't have one without the other. They were interconnected.

For me, an agroecosystem right from the beginning was an integration of social and ecological knowledge. Hence I felt comfortable in environmental studies, an interdisciplinary department where I could explore both. It was a challenge going over to biology and giving a seminar, because they only wanted to hear the science. They didn't want to hear the other part.

And trying to go up to Davis and talk to them about it. At that time (and I'm not sure they've changed all that much even today), they were looking for techniques, practices, technology, ways of farming, and less interested in the broader issues of sustainability. At that time production was the goal, improving production. Hence what we were saying with agroecology—as long as we were just talking about practices, they'd talk about it. But when we'd talk about social processes, they were less interested or willing to think about them.

So it was a challenge, constantly, trying to define what agroecology was. And when we started thinking about the idea of adding on top of the Farm and Garden (sigh) some sort of—at first I might call it an academic focus, but it was more than that. But at the same time, you know, in the university, if something like the Farm and Garden is going to survive it has to have an academic component, period.

Reti: Otherwise the university is not going to support it.

Gliessman: Yes. I was told right from the beginning when I got here, from several different sources, that the Farm and Garden's days were numbered, that they didn't have enough connection to the academic programs or the teaching programs of the campus. Hence that eighteen acres at the time (we didn't have

the extra five) was being looked upon for other uses. I told you about the meeting with Alf Heller—

Reti: Yes.

Gliessman: —and how he seemed to be able to look beyond just the practice, to something bigger of use to the state of California, of use to agriculture in general, and hence supported the beginnings of the Agroecology Program through the connection he made with us to Huey Johnson and the state license plate fund, and through his own willingness to establish the endowed chair. He saw something bigger, and I think always has. So that really gave us the ability to take the name Agroecology Program. (chuckles) And we did take it. Nobody gave it to us. We became the Agroecology Program. Yet I also remember that people would use that term, or they would say “The Farm and Garden.”

Reti: Right. That’s still kind of—

Gliessman: Oh yes, still. It’s the Farm and Garden. Not even CASFS. (laughter)

Reti: (laughter)

Gliessman: So I would always try to say “The Farm and Garden facilities of the Agroecology Program,” respecting the fact that they pre-dated the program, but the program is able to build upon them as a component of what we can do. Because, what I began to believe fairly quickly after I got here and we got the Agroecology Program started, was that we had a much bigger job to do than just maintain the Farm and Garden and the apprentice course. We had a big job to do. That job was to revolutionize the way we think about agriculture. Period.

That was our job. I still feel today that that's my job. I think we've done pretty well at it over the years, as I look back. It was always a challenge in those first years to keep things going here, and do that bigger job. It pulled me away from here a lot, as I was invited to speak places, and asked to write papers, and teach courses in different places. But it was an important piece of what we were all doing, because we had a much bigger responsibility than to just maintain the Farm and Garden.

It wasn't easy. It created conflict, I think, as folks here had their desires, and their needs, and what they wanted to see happen, and still do, versus the bigger job of changing agriculture, changing our understanding of food systems. I think right from the very beginning that was always one of our goals, my goal, anyway. And as we moved through the eighties, the publication of that first book with Springer-Verlag on research approaches.³⁶

Reti: The one you showed me last time?

Gliessman: Yes, that was the first major piece beyond just chapters in books and articles, that tried to synthesize a bit what agroecology was and how you applied it, at least in a research setting. The final chapter of that book goes off and talks a little bit about some of my thoughts at that time of how to move beyond the research approach into the connections with social and economic components in the change process. It dated back, if I recall, to a pretty interesting conference that was held at Cal Poly Pomona in 1984, the proceedings of which I have. It was "Agriculture and the Changing World Order." It was one of the first conferences where sustainability as a concept had come forward. I always go back to that

one. The term may have been around, but it's the first time it really came together as a unified approach to understanding change and the directionality of where we want to go. And agroecology was one of the tools for doing that. That's what came forward at that point.

Reti: So to those people researching the history of sustainable agriculture, that's an important conference to know about.

Gliessman: Yes. I cite that in my history of agroecology as a key step. So over the eighties to the beginning of the nineties—teaching agroecology, building agroecology, supporting it, trying to find funding for it, putting up with the challenges and the questions—what became kind of frustrating through some of that time, as I recall, was just being able to define it, to be able to explain what it was, agroecology, so that it could be used as part of a change process.

[At the same time] I'm continuing to work in Mexico and trying to build a research program here. We got the whole conversion study process going with Jim Cochran beginning in 1987 through 1990, into the beginning of the nineties, as we branched into other crops like apples and artichokes, and began to interface more and more with conventional growers who were talking about transitioning to something other than conventional farming, and organic beginning to catch on at that point. We were in a position, because of our work, having set up a protocol for studying this transition process of how to get from conventional to organic by taking out one set of inputs and practices and putting in another, and meeting the norms of certification, and having a research basis for doing that. So that was, I think, pretty important stuff.

But I also remember during that time, to begin with, my grad students that I took on, either master's or the first couple of Ph.D. students I was allowed to have after I got tenure, through biology, our work was largely concentrated at the Farm. We'd built the laboratory in late '83-'84. We had a place to start doing that work. We got electricity onto the Farm, much to many people's dismay. (chuckles) I thought for sure I was going to have to remove some bodies from in front of the bulldozer, but fortunately other people were able to intervene in that process. So there was that resistance going on there to the bigger story. I mean, people, and I understand this, were very much committed to what they were doing locally as apprentices, as the apprentice program. They had survived ten or fifteen years of almost no support, and that survival mode had created an attitude that was important because it was a survival attitude and it had kept them going. But, to tell you the truth, it seems to me that even today that same attitude lingers, strongly. It's been important and valuable in terms of maintaining the program, but it's also been a roadblock to change, to adaptation to a bigger agenda, it seems to me.

By the early to mid-nineties, I'd been at it for over ten years as director, and wanting to have time to focus more on the bigger picture. I was getting a little tired of the day-to-day inwardness, although I knew it was important to maintain. I didn't want to get rid of it or anything. I just wanted to be able to connect it to a bigger process. We went through a couple of transitions. At the beginning of the 1990s, I hired an assistant director with the hope that she would be able to take up a lot of the day-to-day operations and management so I could

go on a little bit more to expanding my teaching and carrying the story a little further beyond just Santa Cruz.

Reti: And who was that?

Gliessman: That was Jackie Lundy. And for four years, five years she was in that role.

The Kellogg National Fellowship Program

I guess, if I back up a little bit, something that really pushed me to think about a bigger picture was getting awarded the Kellogg Fellowship. The Kellogg National Leadership Program (KNLP). I was awarded that in 1985. Three years, '85-'87. It was a fascinating program. Kellogg doesn't do it anymore now, but for fifteen or sixteen years they would choose forty people from a broad array of areas in health, education, and agriculture, people who were, they felt, of leadership potential, who were developing leaders. This three-year program was to encourage that leadership process by a series of seminars and learning situations that in a sense liberated you from the normal restrictions of thinking about what you could do, and instead encouraged you to think about doing anything you wanted to do to create change in communities. I really had a good time during that time, and learned so much, and all forty of my fellow members of the group I was in—every one of them was doing wonderful things, and believing in themselves and developing skills to be leaders. That opened me up to that change process, knowing I could do it, believing I could, despite the roadblocks, despite the critics, despite the resistance to changing something as big as agriculture. (laughs) To say the least. So I was able to build that way of

thinking, even though it was maybe there to a certain extent, but never facilitated.

Then, like they say, "Once a Kellogg fellow always a Kellogg fellow." There were reunions and all kinds of stuff after that that continued to keep that sort of sense going. I took part in, and even organized, some of the activities for later groups, and enjoyed that a lot. In fact, I was supposed to go to one in two weeks and I just called them and told them I can't make it. That's our reunion of all of the groups. There's just too much going on right now. I can't break away, with the [International Agroecology] short course coming up and all that stuff. Just too much on my plate right now.

So it was interesting, having that experience with Kellogg and believing in our ability to create change in society, and then trying to bring that back here to Santa Cruz, and struggling to apply what I learned. And who knows, my own personality? Whatever it might be. Some people are good at that kind of stuff, and some people aren't as good at it. The actual application of it at an organizational level I found a little more difficult. But I can look back on it now and realize that some of it was me, but some of it was just the intransigence, the inability to change or think about change. No matter how reasonable the change process is, people won't want to change. It's fascinating to think about. And how long change takes. You know? It just does. What I've found myself thinking more and more all the time, is it's like planting an acorn knowing I'll never see the tree, although I can think back on some of the trees that I've planted over at the Farm, and they are trees now. So you know, it depends on what species, I guess. Or how big the change. Same kind of idea.

Marc Buchanan

Then, in 1994 we had this wonderful opportunity. One of our graduate students who did his master's degree with us, Marc Buchanan, went off to North Carolina State and got a Ph.D. in soil science, and did really great work back there. And then through one of the university Target of Opportunity (TOP Fellowship) programs he came back here, and we took him on for a year with support from the Office of the President, with the idea that at the end of that year we could potentially offer him a position. It worked. He joined our faculty, I think in the beginning of 1995. I immediately sighed a sigh of relief and took a year off.

Reti: You'd been holding it together.

Gliessman: Yes, and let him become the acting director. He acted like that was something he really wanted to do. He had that same desire to create bigger change, and yet [was] a very practical guy with his hands on the ground and feet in the soil and all. So he jumped in. Yet at that point (gosh, here's a whole other part of the story), I think he was able to connect well to the folks at the Farm and Garden, and show them both the practical side and the bigger-picture side. I started to get really excited, thinking, boy, this is the opportunity we've been waiting for!

Writing the First Textbook in Agroecology

Meanwhile, I had been playing around a little bit with taking my class notes from my agroecology class, and I got them into an electronic form as we first started to do computers. First I printed it out and made a reader out of it, and handed it out to everybody. Then the next year, the first year we could put it in

electronic form, people could go to the library and look at it. So by 1995, that year that I was not having to be the director, is when I really made the effort to translate those notes into an electronic form, and began thinking—even though, I guess it was 1985 when I was invited back to Georgia by Gene Odum, one of our founders of ecology in the United States: the first textbook of ecology published in 1953 was published by him.³⁷

Reti: Yes, I used that book when I took ecology from Ray Dasmann.³⁸

Gliessman: I used it when I took my first ecology course when I was in college. He [Odum] invited me back to Georgia in '85 and '86, because he was beginning to think about agroecosystems and the idea of agroecology. I gave a seminar there and he just looked at me, I remember, and said, “You’ve got to write a textbook about this.”

Reti: So he was the one who got you to start—

Gliessman: Yes, he was the first one to tell me that I needed to do that. And to hear that from him, Gene Odum. I thought, “Wow, this is cool.”

Reti: Yes! Now, did you know him earlier than that?

Gliessman: I’d met him at conferences. I’d started to work with some of his grad students. We had connections through the work we were all doing. We were meeting at conferences. I organized a conference in 1986, I think, in Washington, D.C., and it led, ultimately, to that 1990 book. A couple of the folks who were working in that program came to it. They were building a book on agroecosystems. There was a book published in '87, '86? called *Agroecosystems*.³⁹

It was his group, Gene Odum's group that had published it. It wasn't agroecology. It was just the agroecosystems approach. So we connected at that point. But I never had time from that point until 1995 to think about putting all that together. Finally, when I took leave from the directorship that year, I was able to bring the first draft together. It wasn't published until the end of 1997. I went through 1996 and into 1997 working with Eric Engles as my editor. We finally put it all together in its final form. It started in 1991-92 as a reader; in 1993-94 in its first electronic form; in 1995 we started writing. By the end of 1997 it was finished.

During that year I was supposed to be gone, but I was actually here the whole time because I was helping Marc manage all this stuff. He was a new assistant professor and trying to get his program going as well, and here he had this responsibility for directorship of the Farm. It was too much. On top of that, our chair of environmental studies at that time was less than supportive of agroecology. He was building a whole program in conservation biology. That's what he was, Michael Soulé, [a conservation biologist]. He was less supportive of agroecology. He didn't see it as a science, a strong science. He thought it too practical. He kind of came out of that old school, as far as I'm concerned, in my opinion, anyway. That the problems in the world are because of people, and if we didn't have so many people, everything would be fine. Hence we need to do a better job of protecting nature, and helping reconstruct nature, and protect biodiversity, and agriculture goes against all that. Even though we gotta eat. Anyway. I had some long arguments with him about all of that.

So he didn't support Marc very well. Even though Marc was an excellent teacher, an important part of the interdisciplinary approach of our department, he just plain didn't support him very well. Marc started to get frustrated with the university, and up and quit. He said, "I don't want any more of this crap."]

Reti: In that first year?

Gliessman: He lasted two years, I think. I forget exactly. There we were. I tried to get back into it, but the university wouldn't let me. They actually told me, "No. You're not going to be the director." They made Jackie Lundy the acting director, yet she struggled as well with the organizational part. She wasn't a faculty member. She didn't have that strength behind her. It makes a big difference.

And then they sort of put the program in holding, kind of a receivership almost, where they named some faculty as sort of a team of acting directors, people like Bill Friedland and others, Margaret Fitzsimmons stepped in. But none of them really committed full time to it. They were just kind of trying to keep it going. And during that time, I guess the survival instinct of the apprentice course paid off in keeping that part going, kind of being self-sufficient. And the academic side being separate from the Farm, in a sense, through environmental studies, the courses I was teaching, they continued to develop.

Then the book came out.⁴⁰ Suddenly, as far as I was concerned, I had a way of showing what agroecology was. I didn't have to describe it. There it was, in print. Shortly thereafter, the lab manual came out to back it up as well, in that first year. Thanks to Eric's editing, we were able to put a product together that

speaks for itself. I'm really happy with the way that's worked. That's where agroecology took a big step beyond [UCSC], although I think it was in the process of doing it anyway through a lot of other things, and has now become still the only textbook in agroecology that's out there and people use it. That's been pretty exciting.

I think it was during that time that I was asked (or told, or however you want to interpret it), to step down as director and then not allowed back into it, there was a proposal to change the name of the program. There was a very strong movement to eliminate the word agroecology from the name. They wanted to just call it the Center for Sustainable Food Systems. I forget again how this exactly happened, but I was dead-set against that. And I think it may have had something to do with Alf Heller stepping in and saying, "I've endowed the Agroecology Program and I want that name to stay there." (laughter) The campus sort of backed off, so it became the Center for Agroecology and Sustainable Food Systems instead. Which is good, because a lot of people probably even today still have problems with the simple word *agroecology*, because they can only think ecology, and they can't think the agro, bigger picture food systems part. When my first textbook came out it was *Agroecology: Ecological Processes in Sustainable Agriculture*. The second edition is *Agroecology: The Ecology of Sustainable Food Systems* now published by CRC/Lewis/Taylor & Francis 2007. That's an intentional change on my part to try to explain that agroecology is more than just production systems. It's basically an ecologically based approach to understanding sustainability of entire food systems. It's as much a social phenomenon as it is an ecological phenomenon. But it's grounded in ecosystem

thinking and interconnectedness, relationships, change over time—all of the concepts that are grounded in ecosystem thinking, but in a human context.

It's been fun for me, especially since we began CAN with a group of grad students working together, taking agroecology into communities, really strengthening, again, that change process part of it, something we now call action research, or action education, where we're not just learning how things work, but we're learning how to take that knowledge and create change. We take the step beyond being just researcher observers in that process. We become participants in the change process. That's where for us participatory research and participatory learning becomes a collaborative process with all of us in the food system. I think that's been the latest evolution of agroecology that again continues to grow and circle out beyond the Farm and Garden, circle out beyond UCSC, and takes on kind of a life of its own.

Reti: I definitely want us to talk a lot more about the Community Agroecology Network (CAN) later.

Gliessman: Yes. So by, let's say, 1998, after my book was out, gosh, I just felt such a relief. And then willing to take on the next set of things. That's where the whole idea of sustainability and how to monitor it, use it as another one of our tools in the change process, has occupied me—and a little book that we published in 2001, *Agroecosystem Sustainability*, a collection of papers.⁴¹

Reti: That's a great book.

Gliessman: Yes, it's a cute little book. Kind of pricey. But it's an attempt at bringing the concepts together in one little place, and at that time I think was a good step forward. It began as a symposium that we organized in Florence, Italy, in '97. The book had just come out, and we held this conference and invited a bunch of people from different parts of the world whom I knew were grappling with the concept of agricultural sustainability, and trying to work with it both as a research tool, but also, again, as a change tool. We then took all of those proceedings and invited a couple more and turned it into that little book. It came out in 2001.

The other thing that was happening at that time was that— I did my book with a little tiny press called Ann Arbor Press, out of Michigan.

Reti: Which book are we speaking about?

Gliessman: My textbook. And it was kind of neat to do it that way, because [it was] a small press, very personable. I could call and talk to the person in charge, and the book came out pretty easily, and they kept the price very reasonable for people to be able to get it. But then, just two years later, Ann Arbor Press was bought by a bigger press, Lewis Press, with a pretty good reputation in environmental and agricultural textbooks and technical books, journals even. Then they were bought by an even bigger press called CRC. More recently they've all been bought by Taylor & Francis. So it just keeps getting bigger. But the wonderful part is they put a person in charge of agroecology publications. His name is John Sulzycki, a really interesting guy that I've enjoyed working with now over the years, inside the press, who early on saw the potential for

agroecology, partially just to sell books, but partially as a story that needed to be told. I don't know how you find someone like that, but he happened to come along, thanks to a couple of other folks out in the agroecological network [like] Clive Edwards, a professor at Ohio State University. Clive had gotten together with John with this idea of starting a series of books in the field of agroecology. I was invited to be on the editorial board of that to start with, and my textbook came out right at the time they were thinking about doing this. A couple of years later the first numbers in the series started to appear.

And since the late nineties, up until now, they've got a pretty interesting collection of books called the Advances in Agroecology Series published by CRC Press. That little *Agroecosystems Sustainability* book was part of that series, and it continues to grow. I'm struggling right now on another book for that series that I'm trying to get done, an edited book that I'm working on with a couple of people, on the conversion process to sustainability, what we know about farm communities who have gone through the process—where have they gotten to and where do they still need to go, what do we know about all that.

Reti: That's critical.

Gliessman: Whew! Getting it done is a whole other story. (laughs) So that series has been really important, and it's just wonderful how it's grown, and how John has promoted and supported me in expanding the agroecology piece. We meet frequently whenever we can at Ecological Society of America meetings. He's there with a book display from Taylor & Francis, and we go out to lunch and talk about the future of the field, and the way that things are going. He sends me

things to review and asks my opinion about whether they should be included or not. It's really been great and he's done a great job of helping promote the field. So that's one other little piece of the equation.

Stepping Down from the Directorship of the Farm and Garden

Reti: That's great. So you were starting to talk about how the name of the program changed and you were no longer director.

Gliessman: Yes. At that point, 1998-99, I really pulled back. In fact, I remember in 1996— When did they start California State [University] Monterey Bay? [1994—Editor.] To tell you the truth, I was so frustrated with UCSC that I started to look elsewhere. I applied in one of the first calls for faculty at CSUMB. They were focused on education and experiential learning. I had a vision of taking the educational piece that we were trying to build for undergraduate students here to CSUMB. I made that proposal to them. But I think it was a little too advanced for them in some way, or just wasn't part of their agenda, or I was too old, or who knows what? I didn't get it. I was interviewed. They chose one other person instead of me. Interesting to think about what would have happened if I would have given up, let go of the endowed chair, let go of years of trying to build stuff here. But I needed to do it. I needed to know that there were other places I could go if I wanted to. I had a couple of other opportunities come up around the same time: directorship of the Leopold Center; I was asked to apply to SAREP, the directorship there. A bunch of stuff came up. It was fascinating. They all came up around the same time.

A couple of things kept me here—I guess my commitment to Alf Heller. I sat and talked to him long and hard about UCSC and where to go next. A couple of other folks began to support us a lot too at that time. John Halliday, a trustee here in the UCSC Foundation, began supporting some of the stuff. And there was a big transition at the social science level when Gene Garcia was the dean. He'd been a Kellogg Fellow a couple of years before I was, and we had that in common. And my son was on the Santa Cruz High football team and [Gene's] daughters were cheerleaders, so we'd sit around and talk to each other and cheer, actually boo because our teams were losing all the time.

Reti: (laughter)

Gliessman: It was great fun connecting with him [and] then also connecting with him on the agroecology side, and the education side, and linking those together. That was really an important piece in grounding me here. But then he left, and we went through some interesting transition times in the division. Acting deans are always sort of a challenge to work with because you've got to educate them and then they're gone. Then you educate another one and then they're gone. It's something about building relationships that takes time.

The other piece is that when I stepped down as director, I also left my office that I had in the laboratory on the Farm. Because just about the time I was getting ready to go on leave and Marc was going to step in, I'd started negotiating with Brian Walton, the director of the Predatory Bird Project [Santa Cruz Predatory Bird Research Group], who had his facilities up here in the Lower Quarry. He had a couple of choices. One was just dismantle the whole thing. They'd reached

the point where the peregrines were doing well in nature. The program really had been a success. He'd had some health problems. I think he needed a liver transplant. He was on dialysis for a long time and waited and waited, and finally got one. It really helped him so much.⁴² But the program had just reached a point where he was ready to scale back considerably. So he came to me and said, "Well, would the Agroecology Program be interested in the facilities?" We were growing pretty well and needed more space. So I said yes, and we worked out an arrangement, one of those funny little negotiation things where the Social Sciences, which was the Farm and Agroecology, and Natural Sciences, which was the Predatory Bird Project, had to negotiate back and forth between the divisions. I had to transfer some funds to the Natural Sciences in order to pay for the facilities that Brian thought he could put out to auction. It all worked, basically.

Beginning the Agroecology Group at UCSC

I then decided to move from the Farm at that point, to the back end of the Quarry [where the Predatory Bird project had been housed], and took over a couple of trailers. It was a pretty important step, because I went from just having a small office and a little lab there, that was also the teaching space and all that, to having a whole little complex with a house trailer, and a laboratory, and some office spaces. It was fascinating what we were able to do with that space. I started inviting, or accepting requests from international scholars to come spend time here, which I'd never been able to do because we didn't have any place to put them. It's too expensive for someone from Mexico, or someone from China, or someone from Spain to stay here.

Reti: So you actually had residences?

Gliessman: We actually had a couple of little house trailers that we had them stay in. And gosh, the interactions that started to happen. Then we got our own grad program in environmental studies. 1997 was when we started. So I had places to put some of those folks. And we had a place in 1999 to hold the first International Agroecology Short Course.

Reti: Tell me more about that.

Gliessman: (laughs) Yes, it was really fun. During the textbook writing time, the final parts of it, and a couple of years after, one of the people who was here as a visiting scholar was Erle Ellis. He'd been doing research in China. We met at the IFOAM conference in 1994 that was held in New Zealand. I had talked about some of the work we'd been doing in China. So he contacted me later, and I guess he was looking for a place to do a postdoc. I told him I didn't have any funding. But he said, "Well, I've just applied for a big National Science Foundation grant to go do work in China on the evolution of Chinese agriculture from an agroecological perspective. It will pay all my support. Can I come stay at your place?" I said "Well, gosh, yes."

Reti: Fantastic.

Gliessman: So he arrived here I guess the first part of 1996, something like that, and was part of the grad group. And that's about the time Joji Muramoto arrived, a soil scientist. He arrived in 1996-97 also, and I had an office space for him. He had a faculty position at the Tokyo Agricultural University in soil science. It was

very much soil science; it wasn't agroecology. He'd heard about agroecology and wanted to learn more about it, and wrote me and asked if I had funding or anything. I told him no, I didn't. But he came anyway. I gave him an office and then we began finding little ways to fund him to work on strawberries. I used a little of the endowed chair funds at that time to pay him some salary. We got him into the research process and got some grants and began to expand his funding base to other things.

(deep breath) Gosh. An exciting time, having this network. I remember it was in 1998, after we'd been successful at the conference in Italy, and were working on putting the book together, I think it was Erle who finally said, "We got to get this word out further." He helped set up our web page: agroecology.org. His father was a computer person and had a lot to do with the establishment of the domain-name thing. Erle said, "We got to get this! We got to get agroecology." So he talked me into claiming the domain name of agroecology.org *and* .net *and* .com. So we have all three of them. We only use one of them. But he said, "Gotta watch out. Monsanto might capture one of those. We gotta get them." (laughs) That's how he talked me into it. Then he helped design the first web page, that we have just recently updated, and really had a lot to do with it.

Reti: There's a lot of substance on that website.⁴³

Gliessman: Yes. He was a lot of help there. And we used to have weekly meetings of the grad group and the postdocs, sort of like a lab group, and I'd use a different version of a chapter of the book, in that 1996-97 time. We'd go over it and everybody would make their comments and I'd send all the comments off to

Eric [Engles, Gliessman's editor], and he'd accept some and throw out others. We had a great time doing all that.

So when the idea for the course came up in 1998, Erle said, "We gotta get this word out more. Let's give a course." I'd been giving courses. I'd taught at OTS, a course for them for two months. I'd given lots of short courses in Mexico. In fact, I'd gone back to Mexico in the late 1980s, early 1990s to offer the course, and the institution I was working with down there sort of fell apart, and wasn't supporting it well enough. Oh, a lot of different things. Tried to do a course in early 1990. Then, oh yes— Starting, I guess in 1995-96 (boy there was a lot going on! Whoo-whoo!)—

Reti: (laughter)

Gliessman: —was when I was invited down to Mexico to a conference down there on agroecology and education in Mexico. And they'd invited this guy from Spain, who was kind of a radical Marxist rural sociologist, Eduardo Sevilla, from Córdoba, in Andalucía, who had started a few years before a program he called the Institute for Campesino Studies and Rural Development, in Spain. He'd begun a series of courses in what he called agroecology and sustainable rural development. Agroecology, in some parts of Latin America especially, was really starting to take on a social dimension, and becoming a social movement. It had a real social, political agenda.

Miguel Altieri

A person that I really haven't mentioned, who is pretty important in agroecology, is Miguel Altieri, a professor at Berkeley, who started at Berkeley

the same year I started here. He began teaching agroecology there and I began teaching it here. I'd known Miguel through a botanist-ecologist friend of mine at the University of Florida, Jack Ewel, who had been on Miguel's thesis committee, or at least knew his thesis group when Miguel did his Ph.D. at Gainesville, the University of Florida. I was still down in Tabasco teaching there. I'd heard about this guy and we were looking for a new faculty member in our department down there. So I invited him down as a recently finishing Ph.D.

He's Chilean in origin, but he'd lived in the States for a while. He came to Tabasco and we interviewed him and offered him the job, because I was still working there at the time. He looked around at the hot, humid lowland tropics and the crummy conditions we worked under and he said, "No. This isn't for me." (laughs) A year later he ended up taking the job at Berkeley in the biocontrol division there, and started teaching agroecology. We collaborated a bit, and have off and on over the years. We did some joint research projects here at the Farm. We give visiting lectures in each other's classes back and forth. Miguel, very interestingly, and to his credit, I think, much earlier on carried a political agenda, and used agroecology as a way to promote that, saying that, "We've got a political structure in place. It has to be changed. And agroecology is the way to do it, based in our understanding of local farming systems, sustainability." He really got into some strong stuff, and still has.

Reti: And this was in Central America, or here, or both?

Gliessman: Well, he tried to do it here and ran up against a brick wall, which over the years has made it very difficult for him to build a program in Berkeley.

Reti: That's what I was wondering.

Gliessman: Yes. He really wasn't able to do it. Instead he began putting more and more effort into building a network through Latin America, and has done it really well. In fact right now [he] has established what's called the Latin American Scientific Society of Agroecology, SOCLA, and is holding at the end of July an international conference on agroecology in Latin America, in Colombia, and has begun a whole society, and is going to do a journal. All sorts of stuff. He's become that really strong spokesperson now for that whole process.

Yet, at the same time, I would argue with him that I want to see change happen, but my philosophy was always that I can criticize the status quo only if I have an alternative to put in its place. Miguel didn't want to wait for the alternative (at least this is how I always saw it). He wanted to change the system first and then develop the alternative. He was very unwilling to negotiate or to compromise, and got himself in trouble a lot. But at the same time, [he] became a very important spokesperson for the need for change, and the fact that we have to be political, and whatever we do, the statements we do *are* political! I respect him for doing that, and being willing to do it. He's taken a lot of heat over the years for having done it. We need all of this in any kind of change process, and that's really the piece that Miguel has done. He came out with a book in 1987 called *Agroecology*.⁴⁴ It was more a collection of papers, statements. It wasn't really a textbook. But it was one of the first books under that title in a while. And he's revised it a couple of times since then. I let him use some of my work in his first versions of the book. He'd invited me to try and write some chapters for it, but I

never had time. But being able to put together my own textbook and put it into a different context is something I'm glad I was eventually able to do.

Miguel has been prolific as can be over the years. He's worked for UNDP [United Nations Development Program]. He's worked for different programs, and has brought agroecology to a global level in terms of its understanding. He gives courses and travels all over. He's on the road *all* the time. I just can't do that.

Commitment to Teaching

I've always felt it is important to build the name agroecology, but it's also important to form people who are going to do it. Some people say I've held myself back by investing as much in teaching as I do. But I'm not trying to build *me*; I'm trying to build agroecology. I think some people don't see that sometimes. I admit that I have a hard time separating me from agroecology. It's all so connected. I've invested so much in it. Anyway, that's kind of an interesting thing to think about. But I've over the years put so much energy, so much time into teaching and training, and forming people who can be the people who are going to make the change happen, which goes back to what I said earlier, in that a lot of this change is going to happen after I'm gone. If there aren't people in place doing it, it won't happen. So it's a process. That's why all the short courses, and trainings, and extra teaching I do way beyond my normal load in environmental studies, and I always have.

And the short course—from an academic perspective or an institutional perspective, I don't have to do it. I don't get “rewarded” for doing it. But I get

rewarded in the sense of knowing that I'm broadening a network. And this year in particular, after having done it since 1999 the first time in the Upper Quarry, where we wouldn't have had a space to do it because we couldn't have afforded to do it here on campus because we would have had to pay for space to do it. Just that would have kept us from doing it. Because we had no budget. We had to ask people to pay. We had to pay for housing on upper campus and the use of the dining halls. But we were able to pull that together barely, and use some funds from the endowed chair. We broke even. It set a precedent. We were going to do it again the next year. But that next year was 2000. That was when I finally decided, 2000-01, to really take a full sabbatical after having taught here for almost twenty years, in which not only was I not going to teach, I was going to be gone. (laughs)

Reti: Right. Because the last time, you stuck around.

Gliessman: Yes, I stuck around and didn't get hardly anything done. But anyway, it was different. So I did, and that was also the year that they decided to move The Village [a collection of movable student-residence units] from the current site of College Nine and Ten, to the Lower Quarry here. It meant I'd have to vacate my location back there. But thanks to Marty Chemers, who was dean [of Social Sciences at UCSC] at that time, and some support from folks like John Halliday [former UCSC Foundation Trustee], who was beginning to back agroecology and give a little bit of support financially to us—he, I think, was able to promote it sort of behind the scenes with people like Marty and others, saying that he could see the bigger picture of what we were trying to achieve. It was at that point where Don Rothman [Senior Lecturer in writing at UCSC] and Jenny

Anderson [lecturer in environmental studies at UCSC] and I were together one time, and I was telling Don, “Geez. What am I going to do? I got to move.” At first I was just going to move my old trailers here to this location, which we affectionately called The Pit. I said, “Well, okay. And how are we going to pay for moving them?” Part of the fact was that it was in negotiations between Social Sciences and Housing, because this was Social Sciences space, and Housing wanted to take it. In exchange for taking it they had to relocate me and set me up here. So we got together with Don and Jenny, and I was telling them what was going on. And Don said, “You know what? Why don’t you work with the students who are going to be living down there?”

Program in Community and Agroecology (PICA)

Reti: That’s a very visionary idea.

Gliessman: And suddenly the idea for PICA was born, the Program in Community and Agroecology. Both of them [Rothman and Anderson] agreed to help build it, because these were going to be students from lots of different majors. It’s not like they’re just all environmental studies students. So what is the common link? The common link was that we all eat. We’re all invested in the food system. We all live in community. And by building a program around those concepts with a garden, kids get their hands back in the soil again. They reconnect with the earth and they reconnect with each other. Don’s idea: “Well, let’s capture that. Let’s give it a voice and bring a writing piece into it.” And Jenny saying, “Let’s push the experiential learning part of it.”

Reti: Jenny had been the head of the Environmental Studies Internship Program for a long time.

Gliessman: Exactly. I'm thinking, okay, well: agroecology, community, people. It suddenly dawned on me that here was the alternative to the apprentice course I'd been looking for. We had not been able to integrate students into the apprentice course. Yes, once in a while students could do an internship or volunteer, but there was nothing formal. It was always minimal.

The College Eight Gardening Class

I'd begun a few years before that, probably also 1994-96 (God, that time was crazy!) teaching the College Eight gardening class. It all started with a couple of our undergraduate students at College Eight who wanted to have a garden at College Eight. Since I was a Fellow in College Eight they asked my advice on how to set it up, and I'd go down there and work with them a little bit and watch how they were doing it. Then at that time I think was when the colleges told their Fellows that we all had to teach a one-unit or a two-unit seminar for our college once every three years. A couple of those students who started the garden were getting ready to graduate. I thought, okay, well let's see if I can teach principles of organic gardening to College Eight students, and I'll get my credit. I started doing it, and I just kept doing it. I've done it every quarter since.

Reti: Every quarter! It was supposed to be every three years. (laughter)

Gliessman: Every quarter since 1996.

Reti: What's made you want to do it every quarter?

Gliessman: The kids. I get forty kids show up every quarter and want to do it. We have a great time. They keep a journal. I tell them the basic principles of organic gardening. But behind them all is why it is important. I give it a context of sustainability. Last week we talked about a declaration of food independence, all sorts of ideas about consumers taking charge of where their food comes from, how it's grown, what their relationship is with the food system, that they're active food citizens. It's the framework that we teach this stuff in. It's great fun sharing it with these kids. A lot of them are first-year students. Some of them take it multiple times. In fact, I have one student right now who has done it nine quarters in a row. She's the record. She'll be here next year and probably do it for all three quarters then too.

And see, that was happening before the idea of moving The Village down to the Quarry. I got all excited about that, because, well, here at least was a way I could interact with a small group, and talk about the basic principles, and do some composting, and intercrop and work the soil—all the stuff that you do, but one time a week for an hour and a half. I usually supported it through the [endowed] chair. If I needed to buy some plants or something I'd just go find someplace to do it, or buy them out of my own pocket. But, oh well, it doesn't matter. It was working.

Program in Community and Agroecology Residents at the Village

A couple of those folks became some of the first residents in the PICA program. We started that first year, 2001-02. We had one trailer down there, one of the dwelling units. They hold nine people each. We had all nine of them. We had a

garden right outside. It was in the C Quad, a little garden that we put in. We worked with them, and held weekly seminars, set up a two-unit seminar through College Ten. They allowed us to do it, an independent study kind of thing. Jenny and Don came to them with me, and we did that for the first year and we did it for the second year.

Then the program grew a little bit, and we moved to the B Quad, and we started the big Foundational Roots garden. And now, as the negotiations were taking place during the move of The Village down here, and me being relocated here, it was discovered that the trailers I was occupying were so old and were in such bad shape that in the process of moving them they were going to fall apart. Somewhere in there (and I really don't know exactly how this happened), Housing agreed to supply these two [newer] trailers for me. But I also told Housing that I would be willing to work with the residents of The Village to set up a program that gave The Village some kind of a focus. So we, right away, right from the beginning agreed to mutually work together. I think we've worked very well with Housing.

At that time there was less interest in living on campus. The Village was having trouble filling itself [with resident students] and PICA became a way to try and do that. Now we're at a whole different phase, where they've let in more students than there're places to put them, and I'm having trouble keeping my veteran PICANs here to train the new ones, because the campus guarantees housing for the new students. They're kicking the juniors and seniors off campus, even though they want to live on campus, because they have to guarantee housing to the first and second years. It's an issue. I'm dealing with

Housing on it right now to see how we can protect the future of the program. If I can't keep people on, what will I do? We'll work it out.

But anyway, the program kind of evolved, and the A quad here where we have our offices continued to fill that role that the old facilities of the bird program did, where I've got offices for visiting faculty, for visiting researchers. I've got one here right now from Spain. Erle Ellis is back here on his sabbatical from seven years of teaching at the University of Maryland, Baltimore campus. He came back for a year, and that's been wonderful. His wife is one of my former grad students. They met up in the Upper Quarry, and fell in love and got married, and she just finished her Ph.D. here, and does some really amazing work on land rights in Latin America, and agroecology and sustainable development. She's been here too in sort of a sabbatical after finishing her Ph.D.

The International Agroecology Short Course

Reti: You were talking about the short course coming up.

Gliessman: The short course, that next year we were going to do it, but because everything was in flux. They were tearing everything out of here, bringing in soil, compacting the ground, getting ready to locate the trailers. It was a total mess. Nothing was set up. So we cancelled it in 2000. But we were ready to go. In summer of 2001 it was down to the wire. I think about two weeks before the course began they finally got the phones working, hooked up the electricity, all this kind of stuff. The 2001 course happened right here in this facility. We didn't have A-3, which is an old mobile classroom. So we set up canopies, and had the class under the canopies. That first year PICA, the students, the nine students

who were in there, stayed on for the summer and were the cooks for the course. So we were able to do our own food. It was really nice. And we've done it that way ever since.

Reti: Oh, so they get that experience.

Gliessman: Yes. Although in 2002, thanks to one of my grad students at the time, who had done his master's thesis at the Tropical Agriculture Research and Training Center in Costa Rica and had good relationships there and had been involved in training programs himself when he did his master's there, encouraged us to do the course down there. I thought, that's a great idea, because it gave us the opportunity to support what was a growing agroecology movement there by holding the course there, and calling attention within their institution to the focus. That's become a tradition now. So in 2003 we were back up here; in 2004 we were in Mexico; 2005 back here again; last year down in Nicaragua; this year back up here; next year we'll be in the Yucatán of Mexico. Each place we go with it, we build those networks, bring in local folks, the institutions, the government officials, the nonprofit sector. Agroecology continues to mature and grow and evolve, and it's become much, much more action-oriented, in the sense that it's developed tools of participation, of collaboration, of linking everybody from the farmer to the consumer in a change process. And maybe what's allowed that to happen, and kind of intersperses into all this is the development of CAN.

The Community Agroecology Network

Reti: The Community Agroecology Network.

Gliessman: So while the change was occurring here in The Village, it was 2000-01, all the work that needed to be done around here, and I decided to bail, so to speak, and do that sabbatical I was talking about. Since this place was going to be in upheaval anyway, be a construction zone, we decided to rent our house out for the full nine months, and either spend time at the ranch [Condor's Hope], see, because the ranch is the piece that's important in all this too—

Reti: Right. We definitely want to cover that later.

Gliessman: Yes. And this was an opportunity to do some of that. But I also applied for a Fulbright, and got it. The Fulbright was to go spend three months in Mérida, Yucatán, working with one of my former grad students who had done his master's here, Juan José Jiménez-Osornio, one of the first ones who came in when, in the early eighties, I didn't have tenure. (They wouldn't let me have Ph.D's, I had to take master's folks.) Well, Juan was one of them. He went on from here to do his Ph.D. at UC Riverside, and then got a job at the University of the Yucatán. And he began a program that was called Protrópico. It's an acronym that has to do with sustainable natural resource management *and* agroecology. I'd talked to him about coming down there. It seemed like a neat place. He was teaching an agroecology course during that quarter to his master's-level students. He invited me to co-teach it with him. It seemed like a neat place for Robbie to go, because there were some really nice language programs and she wanted to immerse herself in Spanish. Mérida itself is a beautiful town, and the Yucatán itself is a beautiful place with lots of different things going on. So we worked with Juan and wrote the application for the Fulbright. It was a visiting

professorship in environmental sciences, or something like that. We wrote it around agroecology.

So that was set up for January 2001. We went down there and rented a little place, and I started teaching. The first thing we did was go out to a program that Juan had set up at a little place called Mani, a town called Mani. And Mani, it turns out, was where Diego de Landa, the priest in the Yucatán who was so oppressive of the Mayan people—on the steps of a church that they'd built on a Mayan temple, at the site which is now the town of Mani, was where he burnt twenty-seven codices, and essentially eliminated much of the history of the Mayan civilization as we knew it at that point. But fascinating that in that town is a little program, a little school for Mayan farmers started by some liberation theology priests, at least two of whom are Mayan themselves, where the school brought young farmers from communities throughout the Yucatán peninsula to the school. They live there four days of the week and went back to their home community for the other three for the whole year. During that whole time they were taught in agroecology, but also their traditional techniques and knowledge about agriculture. Everything was intercultural. There would be a piece where you learn medicinal plants from the Mayan perspective, and then you learn medicinal plants from an academic perspective. You work soil from a Mayan perspective, and you work soil from an agroecology perspective. And they had animals and crops—some of it traditional, some of it more organic and intensive—all sort of balanced there together.

Yet, at the same time they were learning leadership skills; they were learning culture and history of the Maya. Fascinating, because many of them had never,

ever heard about their own history. The oral tradition had been pretty suppressed during the Spanish conquest and the plantation times, and all that stuff that went on and still goes on, in some respects. But a wonderful school, and we'd teach our classes out there. We'd have our graduate students from his program, from Juan's program, and then the students at the school. Trying to find ways to connect them was really fascinating. To start off, we'd have to explore by making mistakes, and then adjust. Juan was really good at putting us there and letting us figure out how to do it, rather than telling us how to do it.

Reti: What did you find worked?

Gliessman: What worked the most was sharing discovery in the field, rather than taking people to the field and telling them things. Just going to the field and finding things together and talking about what they meant, and where they came from in agroecology, where they came from in traditional knowledge and how they blended and linked.

Reti: It's interesting. It's that Field Quarter kind of approach, in a way.

Gliessman: Yes, a very participatory approach too, where we are learning together, rather than one telling the other. Yet, at the same time, we began to find out that the school was struggling. Financially, it was difficult to keep it going. They had trouble finding the stipends to be able to permit the students to come. They had fundraisers in Mérida. Juan's wife, Rosanna, had formed a community support group and held parties to raise funds to support the school.

While we were there, we had friends come visit us, and family come visit us. We had an extra room in the little house we rented, and they'd stay there. We'd travel around and visit the ruins, and go to the beach, and do the stuff you do when tourists come. We brought this one couple that we were really good friends with. The woman works for the Educational Development Center out of Boston. They do curriculum training and teacher training, and in-service stuff and all of that, similar to what the New Teacher Project does here now, but especially in science education. Robbie had gotten to know this woman very well because of Life Lab and stuff that she'd done. So they came and visited us. We took them, amongst other things, to this school. While we were there, we heard the story about the financial stuff. I remember it was Jimmy, Judy's husband, who remarked, "You know, maybe we ought to form a nonprofit and try and help these folks." We were saying, "What do you mean, form a nonprofit? That sounds like work!" (laughs)

Reti: (laughter)

Gliessman: And he said, "Yes, but maybe we can get a little funding together. What do they need? Three thousand dollars? We can raise that." I think we were sitting on a little hotel on a veranda drinking rum or something when Jimmy had this idea. He's a lawyer and we said, "Okay, well you're going to be in charge of the legal parts, and we'll do the other part." He said, "Fine. No problem." Well, we sort of forgot about it.

And after our three months there, Robbie and I, we still had three months to go before we could come back to Santa Cruz and be in our house. So we set off on a

little journey to visit some of my either present or past grad students in the communities where they were working. We went to Costa Rica, because a couple of our students from environmental studies had already started to come down and do home stays, starting in 1999. They had taken the agroecology class and were interested. We went to Agua Buena, the community I'd lived in in the early seventies, and still had connections with.⁴⁵ The people we knew there helped us set up a program where kids could come and live with a family for ten weeks and work with a coffee cooperative, a six-hundred-member cooperative. The kids came down and started to get to know what was going on there, and what the issues were. It was just at the beginning of the coffee crisis, and they were beginning to come back with these horrendous stories of collapse in markets, and people struggling to survive.

We decided to go down there and see for ourselves what was going on. I wanted to reconnect with Darryl [Cole] and the community that I'd been a part of many years before. So we heard this story of struggle, and the desire of the co-op to do something different, to work with our students on projects that would help the community, and everybody working hard, just like the teachers at the school and the students at the school at Mani working hard.

From there we went to El Salvador, where [UCSC environmental studies graduate student] Ernesto Méndez was doing his study, and went up to the communities he was working with, and heard about their struggles in the coffee crisis, and how, though their little coffee plantations were preserving biodiversity, they needed some way to sell their coffee at a better price so that they could keep doing that.

Then we came up to Veracruz, to Huatusco, and went to see Carlos [Guadarrama-Zugasti] and Laura [Trujillo], my two students from Mexico that did their Ph.D.'s, some of the first ones in our program here. They are working in communities that are struggling to maintain their livelihoods in the face of the coffee crisis. Carlos and Laura are doing training programs in composting, and diversity management, and local empowerment, and self-organization. By the time we'd gotten to that last stop, we kept saying, "Here're all these independent, sort of isolated projects and communities that are struggling to do kind of the same thing. What could we do to link them, to network them, to make them stronger, and at the same help them help themselves?"

And that's where the idea for Community Agroecology Network came from, as in networking these communities using agroecology as the linkage between them, but in community. So Community Agroecology Network was born, and we went back to Jimmy and said, "Hey Jimmy. You had the idea. Help us put together a nonprofit." While we were traveling we kept thinking, "can we do this? Do we want to do it? Is there a need for another nonprofit? There are so many of them out there." We just finally decided that yes, it would be worth doing.

Reti: Because there wasn't one that was specifically devoted to agroecology.

Gliessman: No. Not really. And not in these particular communities, with this resident researcher having established a relationship with a community using a participatory, action-oriented approach in agroecology. We had this going on. The community we didn't get a chance to go was Chris Bacon's community in

Nicaragua, who is also part of the network, where we held the course last year, so we did finally get there.

So gosh, we decided to do it. I remember even before we'd finished doing all the 501(c)(3) negotiations with the IRS and all that stuff you gotta do (Sheesh!) we decided to do a fundraiser. And between Robbie and me, our little network of friends and family, kind of like your Hanukah and Christmas card list, you put it all together. We sent out this one-page appeal about all these communities and what they're trying to do. The first appeal was focused on trying to put together three thousand dollars for scholarships for the students at Mani. That was the first thing we decided to try and do. And lo and behold, we were able to put it together within a couple of months, thanks to this network of about two hundred addresses that we had. And in the middle of all that, while that was going on, a hurricane hit the Yucatán and severely damaged the school. So the three thousand dollars arrived right after all that happened, and was used instead to repair the damage.

But there we were. We'd started. That was 2002. Well, the coffee crisis had really hit by that time and a couple of our students who had gone down for home stays in Costa Rica were coming back with packages of coffee that the families they were staying with had prepared, to sell directly to their friends and family in order to send money back down. I've always been bothered, to say the least, by how the middlemen get in between the consumer and the producer. It goes way back to when I was selling produce for Loma Linda, and the stores that we were selling to were giving us such a crummy price and giving us such a hard time. It's just something I always carried. I saw the same thing happening in the coffee

industry. It didn't make sense to me that producers got paid so little and consumers paid so much. It didn't make sense. It still doesn't make sense!

And out of that idea came the idea for: let's connect the two. Let's find a way to develop an alternative market structure. Part of that was born out of the last ten years or so, as organics has really started to take off, and all the experience with Jim Cochran here at Swanton Berry Farm and his success in marketing his strawberries and other things directly to the stores and to consumers at either a farm stand or a farmers' market, and that kind of a model starting to really establish. Well, here we started thinking, well, why not a global farmers' market? Isn't there a way we can get coffee that's roasted and packaged directly up here? We first had to work with the community, asking them, well, can you guys roast your own coffee? Can you bag it? Can you maintain quality? Can you get it here? How do you do it? Well, let's try the mail. And the mail worked. All the details had to be worked out in order to make all that happen.

Reti: I never thought of all that!

Gliessman: This was something they had never, ever done. And we did several things. They came up. One of the farmers and a coffee exporter from Costa Rica who was working with the community, they came up and spent a week with us. We went to the Santa Cruz Coffee Roasting Company, and we talked around on campus, and they figured out, "Yes, we think we can do it." They thought they could. So I think it was end of '03 we started our first sales of coffee direct from the community. Again, we went back to that two-hundred-member list and

asked them to buy coffee, but told them the whole story about direct connection to the consumer.

This is at the same time that the Fair Trade movement was really starting to get going, Fair Trade certification. At first I thought, gosh, Fair Trade sounds pretty good. It's guaranteeing a fair price to the grower. But then I began to realize, wait a minute, what do you mean by fair price? At the peak of the crisis it was \$1.26 to the grower with Fair Trade, and it was sixty or seventy cents with conventional trade. But then I'd ask the growers down there, "Well, how much does it cost you to produce coffee?" And they'd say, "Well, it costs like \$1.50 or \$2.00 a pound to grow it."

Reti: So they are losing money.

Gliessman: I was thinking, wait a minute, that doesn't sound very fair. And then I come up here and I look at the price the consumer is paying, and even when you buy roasted coffee in a bag, it's ten, twelve, thirteen, fourteen dollars a pound Fair Trade Certified. Wait a minute. Something is not right here. (laughs)

Reti: Yes, where's that money going?

Gliessman: Where's that all going? (laughs) The people in the middle, between the grower and the consumer, they push the price up. It's not costing them anything to do Fair Trade. And the amount they are actually paying extra for the Fair Trade certification doesn't really reach the farmer. So that's a whole other story that has occupied us. We have a book that's supposed to come out with MIT Press where all of our group of researchers and David Goodman and

Johnny Fox, we've all teamed together. It's going to be a pretty major statement about, what does fairly traded coffee mean from an agroecological and a sustainability perspective where the whole food system matters, not just the price of the commodity and the commodity chain. And how that's community based and how we build that. There's even a whole chapter in there that Robbie wrote about CAN, and CAN as an option.⁴⁶

Reti: How great.

Gliessman: So CAN took on this marketing side. The other communities we work with, at least [the ones in] Nicaragua and El Salvador, they are not yet able to mail the coffee or to roast it themselves. So we've worked to find ways to get the green coffee up here, and then make a deal with Santa Cruz Coffee Roasting to roast it, and package it in one-pound packages, and be able to sell it at the farmers' market, or supply it directly to the university. And that's where the link with the fair trade movement, the student movement, especially the United Students for Fair Trade organization, pushed our campus, again as part of the Student Environmental Center, the Education for Sustainable Living Program, the Food Systems Working Group, the Students for Organic Solutions⁴⁷. On and on. It's the student movement that's been going for four or five years now in sustainability [that] picked this up, and helped us really motivate the campus to shift its coffee over to CAN. And the bulk coffee, that sale of a large amount, four or five hundred pounds a month, makes an incredible difference for the communities we're working with.

Then there's the whole research focus that CAN researchers do. We have a three-pronged approach. There's the alternative market development; the education component with the interns, students in the communities working with this stuff and gaining that experience as undergraduates. And then there's the research piece, the participatory action research model in agroecology, where we work with the community in many aspects to help introduce stronger elements of sustainability in what they do. It's linking livelihoods, and conservation, and alternative market development all together in a research mode. That's been fun, doing all that. And really, the work of a network of these folks that, personally, I guess I've felt I've been investing my time in so that they become the ones that really do this stuff.

It's exciting now to see them moving on to the next phase in their own work. Carlos [Guadarrama-Zugasti] and Laura [Trujillo] in Mexico work at an educational center down there, and Ernesto [Méndez] just last year got a job as an agroecologist as a faculty member at the University of Vermont, and is starting up a whole program there. And Chris [Bacon] is going to be teaching a participatory action research course for Latin American studies here in the fall. All this stuff is continuing to expand and grow, and it's pretty exciting. CAN has been a big piece of all that, and PICA has been part of that, and there are more and more linkages now between PICA and CAN, with PICA being the residential, on-campus piece. And there's a whole student organization with CAN that pushes the coffee within the university, and helps us do our sales campaigns and manages all that. CAN is run eighty percent with student work.

Reti: I've seen you and Robbie down there at the farmers' market selling the coffee.

Gliessman: But they [the undergraduate students] are the ones who are down there all the time. CAN hires a student that coordinates it, but most of it is for internship credit or volunteer.

Reti: So they've got the coffee in all those coffee carts on campus, and the dining halls.

Gliessman: Yes. That's been really wonderful. Alma Sifuentes, who was in charge of Dining Services before she moved upstairs a little ways, her whole approach, as she told me one time, is, "The dining halls should be not only a place to eat but a place to learn." She supported the whole idea, and helped us figure out how to get through the university bureaucracy and sell direct. Man, oh man, that was a challenge. But she helped us do it. And Candy Berlin, who is now the dining services director, she continues to be helpful. Scott Berlin also. The on-campus folks have just been wonderful. And connections in Purchasing. They've helped us find ways to get through the system. Now the students are working to get other campuses to start CAN chapters, and get CAN coffee into the dining halls, and promote internships for students from other campuses and other schools.

Reti: Other UC campuses?

Gliessman: There's work going on right now. One of our students has done a whole expansion campaign as part of her senior thesis work, and motivated folks

in Santa Barbara, at both City College and UCSB, to start programs. It's put me back in touch with guys that I went to grad school with, who are teachers at those places, and now we're trying to build a link there. So it's fun, how it grows.

More on the International Short Course in Agroecology

Reti: Today is June 20, 2007, and I'm here with Steve Gliessman at PICA. This is our fourth interview.

Gliessman: Wow.

Reti: Yes, lots to cover. Today, Steve, let's start by talking about the folks who are coming for the International Short Course in Agroecology this summer.

Gliessman: Well, we talked [last time] a bit about the short courses, the fact that we started our first one in 1999, and pretty much every year since, we've done it. We've done it completely on our own. It kind of funds itself through participant fees. I've always looked at it as an opportunity, on the one hand to bring a group of people here who want to learn about agroecology who are then going to take it back where they came from and apply it, but almost equally important, if not more important, is it's been one of the key training grounds for my own group of students and related colleagues here locally. If I think about the curriculum they take as graduate students in environmental studies, it's not a curriculum in agroecology. It's a curriculum in environmental studies, the broad, dispersed field, with an attempt at trying to get or give people opportunities to think about how you do interdisciplinary research. But it doesn't really have very much agroecology content. Students get that, I think, when they do their Ph.D. work. But they need more than just their own study to develop full capacity as

agroecologists, in my opinion. Our first international course was early on in the time that environmental studies started its grad program. I guess we started it in '97. That's when our first group came in. I had three or four students by that time—Carlos and Laura from Mexico; Ernesto Méndez from El Salvador. Previously, of course, I'd had some of my master's-level students when I was only able to take them through biology, and yet was still in pretty close contact with them, people like Juan José Jiménez from Mexico City, who went to the Yucatán. That's where we spent our sabbatical in 2001, remember, and made the link for the start of CAN.

Reti: Yes, that was fascinating to hear about.

Gliessman: And then Francisco Rosado May, a wonderful guy. When I was teaching down at the school in Southern Mexico, he was one of my undergraduate advisees, and was one of the students from a Mayan background who also helped connect me to Mayan agriculture. We had wonderful exchanges during that time. That connection of his, coming from that background of traditional knowledge, and me coming from a background of agroecological knowledge, and the way they've mixed, and Francisco being one of those where that linkage was so complete. As I was leaving that school, he was starting his master's degree, and I stayed on his committee for his master's as well, and had advised him on his undergraduate thesis. Then after he finished his master's, he came up here in that interim period after I got tenure and could take some Ph.D. students as long as I had a biology co-advisor, even then. He came up and did his Ph.D. between me and Jean Langenheim, and went back down to Mexico and got very much involved in the beginnings of a new university, the first public

university in the state of Quintana Roo, as one of the faculty, and then ultimately became the chancellor.

We made quite a to-do about it when it happened, had him come up here and he met MRC [Greenwood] when she was chancellor. Here is one of our alumni who has become chancellor of a university. He did that for several years, until he decided to step down, and just a few months ago was named the chancellor of a new university. It's called the Intercultural University of Quintana Roo, part of a nationwide program in Mexico, where they have built universities. I think his is the eleventh one, now in regions of the country where there are concentrations of indigenous peoples. It is not an indigenous university, where they are kind of separate and only immersed in their culture. It's an intercultural university. For example, at Francisco's school courses are taught bilingually in Mayan and Spanish, and there are courses of study in language, courses of study in culture, and courses of study in agroecology and sustainable rural development (that's what it's titled), with a focus on recapturing that traditional knowledge from the culture and linking it to agroecological knowledge. I'm on a board of advisors for his university, developing that. He'll be up here for the course too.

So it's really fascinating to think about all this stuff that these folks are doing now in their different places, how it came from their studies in our department, the work they did in their theses, and me advising and others advising. The short courses allowed us to put it together as a whole story. What is agroecology; what are the basic concepts and principles, and how do we apply them. What are the ecological foundations; what are the social foundations, and how do we link those to move towards sustainability? The work that they were all doing, and

still are doing, are the primary case studies we use in the course. So early on, I had them stand up there in front of the participants in the course explaining what they were doing and why, and how it was important, and what the approaches were. And I've seen it happen time and time again in the courses, not just our course here, but in ones we've given in other places, especially the one in Spain that we have been involved with, the master's and Ph.D. program over there. In a week our group can come in and we can lay out this pathway of what's agroecology, and how do you use it, and why is it important to do so as a way to change the way we relate to our food systems. And as it unfolds, I'm always pleased and proud of what they're able to do.

Reti: Do the folks who are coming to these classes already have a notion of what agroecology is?

Gliessman: Not really. They may have small introductions to it. Some people have more; most people have less. But they have a desire to get it. That's the real difference. They come to the course because they want what they're going to get. They have some idea of what it is, but have never had a place where they could deepen their knowledge and experience in it. We create that, and we model it. Maybe that's the best way to talk about it. And by modeling it as a group, we emphasize how it *is* an interdisciplinary process, how it *is* a whole-systems process—that it requires multiple perspectives and approaches to work. It's pretty neat. It's allowed us to develop this way of thinking, the levels of transition in sustainability. It's a piece that we built in the [text]book.

The Four Levels of Transition in Sustainable Agriculture

There was thinking early on in sustainable agriculture that the first level of research in the transition to sustainability is kind of what goes on in conventional agronomy schools, where they develop an environmental awareness, to a certain extent, and hence focus on those conventional systems to try to make them work better—use a little less pesticide more specifically targeted, apply the chemicals in a more uniform or safe way. So you use less and damage the environment less, but it's still a conventional system. That's the first level, and that's an important level.

But when the interest in the environment grew bigger, and the interest in organic especially grew bigger, we found this need for a second level of research and development in agriculture. Agroecology stepped in right at that time, and the work we did with Jim Cochran with Swanton Berry Farm was an example of the second level, where we took out the conventional inputs and practices and substituted them with organic, using the norms of organic as our guide, yet doing our agroecological analysis of the effectiveness of that substitution from a sustainability perspective. What we began to find was that the problems that we were trying to control and manage with the substituted inputs continued to be problems, because we didn't change the system. It was still monoculture this, monoculture that. It was selecting for the problems, and we were just substituting inputs to try and cure them.

So we came up with a third level that we've moved into in the last ten years especially, and that's where we start thinking about redesigning the food system

so that it becomes resistant to the problems in the first place, so that a different set of ecological processes operate, so that you strengthen things like biological control naturally from within the system rather than having to introduce them from outside—intercropping, rotations, complexity and diversity brought into the system. We very quickly found that associated with that is you also needed to think about changing the relationship to the market, because a farmer trying to adjust the ecological arrangement of the farming system ends up with a lot of different things that he or she has to try and sell, when they are probably hooked into a market that only wants a couple of things in large volume.

Reti: So if you have a polyculture kind of farm, let's say? Suddenly you are marketing twenty different kinds of vegetables.

Gliessman: Right. And where do you do that? That's where [you start to need] a different kind of market, like a farmers' market or a CSA or some market that supports and promotes diversity, which requires a change on the part of the consumer, to think about having a relationship with farmers who are doing that third-level work.

We have more recently moved to a fourth level in our thinking around the transition process, where we're talking about changing that whole relationship between the eaters and growers, the consumers and the producers, so that they are supporting each other, with sustainability becoming a whole different set of values, belief systems, ethics. It's changing a way of thinking. As Rich Merrill always used to say over at Cabrillo [College], "We got to get culture back into agriculture."⁴⁸ That's really the fourth level that we're at now in our transition. In

the short courses we demonstrate how we move through those levels with the kinds of work that we're doing now. We demonstrate the participatory, community-based approaches that we use, so that there's a partnership between the farming communities and the researchers, a collaboration that creates and promotes real change.

It can't be done just by the growers isolated from the consumers. Consumers need to make different choices about where they buy their food, who they buy their food from, and ask those questions that are so hard to get information about: who grew my food and how did they grow it? And what difference does my purchase power make as part of a change process? It's returning to some sort of a food citizenship, or as I had fun playing with, with my students this quarter in a couple of different classes—we need to declare food independence. And that takes lots of different forms: from growing a garden, to shopping differently, to learning who the farmers are that grow your food, and building a network between consumers and producers.

I was going to go to a Kellogg group meeting the day after tomorrow to talk about how democracy works in the food marketplace, and how we could bring it back in. Because as far as I'm concerned, this idea that growers and consumers have no say in setting the price of their product or how much they pay for what they buy, they really have no say—that's not democracy.

Reti: Who decides that?

Gliessman: In the middle. The people who are after the profit that you can make by exploiting both of those extremes. That's not democracy. It's not a democratic

marketplace. With CAN, we work closely, by educating the consumer and working with the producers, finding out what their costs are, how much they need to make, and factoring that into the price. And then explaining that to the consumer, so the consumer is willing to pay that price. In many cases, since it's direct, it's still a lower price than they would pay in the open market. But the farmer is getting a much larger percentage of what the consumer pays. Linking the two. Making that work. But a lot goes on behind that. It's not very simple, because it involves farmers changing the way they grow, so they produce a product that the consumer is attracted to, not just because it's cheap, but because it promotes that level-four thinking—of relationship, of values, of livelihoods, of ways of life—not just ways of making a living.

Reti: Does this tie in with the whole relocalization movement?

Gliessman: Yes, the regionalization of food markets as well. Like New Leaf has just begun to put that on some of their products so you know what's local.⁴⁹ Again, that's a beginning. It just says it's local. It doesn't say who. It could be the biggest grower in the Salinas Valley, who has decided to plant some organic acreage and because of economy of scale puts all the small growers out of business. Now, is that what we want to have happen? I'd say no. They're probably producing what they grow with level-two thinking: just substituting inputs. And they can afford to do it. It's not redesigning the system, and it's not changing very much the relationship between the people who grow and the people who consume.

The Energetics of Agriculture

Reti: Where do you see peak oil leading us with all of this?

Gliessman: Well, I think it's very important, because one of the things that we've tried to include in our analysis of sustainability is what I call the energetics of agriculture. How much energy does it cost to produce the food we consume? And breaking it down into renewable versus nonrenewable sources. We've had some opportunities over the years to do that. We did a study. I think I mentioned the Chinese relationship we had for a while. After we started the conversion study, and were two or three years into it, we set up a relationship with a group in Nanjing, China, and a group in Taiwan, and did a comparative study of organic and conventional strawberries here, Taiwan, and Nanjing, and did a full energetic analysis of all three. It was fascinating, because we looked at our organic system here in California, and it was still incredibly inefficient from an energetics perspective because so much fossil fuel was being used in the production process of the strawberries—everywhere from the tractors, to the plastic, to the drip system, to the baskets that the fruit was in, to trucking the fruit around—all those aspects made them very inefficient. The Chinese system in Nanjing actually used more energy in the production of the strawberries, but ninety-eight percent of it was renewable.

Reti: How so?

Gliessman: It was human labor. It was immense amounts of organic matter, compost, even human waste that was composted; bamboo or plant material for the baskets. It was amazing and incredibly efficient from an energetic

perspective. So getting back to your question about peak oil, that is going to become a factor. I'm glad we've been able to contribute to setting up a means of understanding and analyzing what energetics are in food systems, how that compares to how natural systems work, solar-powered. Yet agriculturally, we channel energy into products that we harvest. The efficiency of renewable versus non-renewable, and breaking dependency on fossil fuels for production will become important.

But it's also going to be very important as all of a sudden everybody is jumping on the biofuels bandwagon, and ethanol, and all that kind of stuff being made either from products that could be or should be food, or displacing food production in order to produce oil-producing crops. We are already seeing the impacts of that in the marketplace, as corn, the primary source of ethanol, is going up in price. As new systems come online, and the demand increases or is satisfied, the price will rise and fall. But overall, it's pushing up the price of basic commodities like corn to prices they haven't seen in a long time. And with free trade having set up dependency of places like Mexico on our corn, and all of a sudden the price of corn to them doubles, the price of the tortilla to the common people goes way up, and they go into economic crisis.

Reti: This is happening already?

Gliessman: It's happening right now, and we don't even hear about it. That's the frustrating part. I hear about it, because I'm linked into those networks. What do we do? Well, we make a declaration of food independence, and we develop a whole approach and a methodology for working with communities to achieve it.

That's agroecology. That's the focus of the courses. It's been fun how the courses have both permitted our students to become professors, to become examples and models, but to work together in doing that. I like to call them the agroecological mafia from Santa Cruz. (laughs) We go here and there with our story. It's more the process, the story that our group is able to build and tell together that's important, rather than the specific content. The content is important too. But it's the process that we use to apply the content together that's so valuable. It's been wonderful.

We've set that up now, with CAN being the main sponsor as a nonprofit. It gives us a little bit more flexibility in terms of where we go with the international short course, how we run the course, all that kind of stuff, than if we had to do it all within the structure of a place like the university. (laughs) Although we bring it back too, by doing it here [on campus], and building more long-term relationships with the institutions that each of the members of our team belong to. Like right now the university has a signed agreement of collaboration with the Federal Intercultural Universities system of Mexico. George Blumenthal signed it last October.

Reti: That's exciting.

Gliessman: So things like that I think are good. But it's out there where it ought to be, rather than locked up in a single institution.

Then alternating the courses back and forth between here and a Spanish-speaking country. In 2002 it was in Costa Rica, and 2004 was in Mexico; 2006 was in Nicaragua, and next year will be in Mexico again. We go to places where

there's a group beginning, struggling to put agroecology into action and we are able to support that by building our course around *them*. That's been a lot of fun. That's really been an important piece of the training. Because if I had to advise, and try and provide everything a student needed—

Reti: It would be impossible.

Gliessman: Yes. And when they see the impact of what they're doing and feel it, it really makes a big difference in what they go on to do. Anyway, that's what we're planning on right now. The 29th of June [2007] is when the next one starts.

Reti: Are these courses documented on video or archived?

Gliessman: Last year we did a good job in capturing all of the presentations we could that were done in Powerpoint. That helps capture stuff. You don't have to copy people's slides any more. We have all of those captured on CDs, and now we've built modules out of those presentations. I'm picking and choosing from those now for designing our course this year. We're in the process of building some sort of a course document that captures how it's done, what its content is. It's now set up in modules of different topics. So we're building a pretty good database for that. And amongst our group of people we share all that stuff. Ultimately our goal is that any one of our group, or any combination of our group, could present the course, and have access to the materials of each other to do it with. So that's been fun. We're getting closer to having that formalized and available for everybody.

Agroecology and UCSC Environmental Studies

Reti: So should we talk now about the building of an agroecology curriculum within environmental studies?

Gliessman: Yes. When I came here at the end of 1980, there was a course being taught called *Principles of Sustainable Agriculture*. Gil Friend was teaching that course. He's doing some fun stuff right now. I've been in touch with him on e-mail. He's got a foundation out of the Bay Area doing sustainable-living development. Other people were involved in that course, but it was kind of the only course in the curriculum, as I recall. It was a little of everything, depending on who was teaching it—from examination of the agricultural crisis to composting. A little of everything.

So when I got here, and brought with me this *agroecología* course that I'd been teaching in Southern Mexico, I redesigned it for here, and the first quarter I was here taught it. We had this course called *Agroecology* starting in winter of 1981, and it was very successful. Lots of students took it every year. It presented the need for additional curriculum, because students wanted more than just that course, and that course really gave the ecological foundations. So I took over the *Principles of Sustainable Ag*, and for the first couple of years I struggled to make it deal with the social side of sustainable ag. That whole field was just beginning, and how you did that was wide open. At first it was an examination of what's wrong with present-day agriculture, and a little bit of a look at the policy and economics of alternative systems. But it was an exploration of why people did

what they did, and what it would take to change, rather than of any alternative yet.

A few years later we hired a couple of new faculty. Deborah Letourneau came in and taught an entomology course. She retained her identity as an entomologist, and she always liked to work back and forth between natural systems and agroecosystems. Sometimes she would be almost all over completely trying to understand relationships between insects in a natural-systems setting and how they evolved, and trophic-level interactions, and all kinds of stuff that go on in nature. But she never really fully developed what I call an agroecological curriculum. One thing about faculty, you do what you want to do. You don't listen to anybody when they tell you what to do. That's just how they are. (laughs) Then when Marc Buchanan got hired and brought in a soils focus, I was really excited because I saw finally a soils course was being taught with a real agroecological focus, because that was his training with his master's here and his Ph.D. at North Carolina State. He wanted to do that.

What else did we do? We didn't have much else. Because we still had to maintain our Natural History [pathway] that got turned into conservation biology. There was all this need for courses supporting that emphasis that kind of competed with agroecology, and there was a period of time I think I mentioned when conservation biology actually sort of looked down on agroecology as a poor excuse for science, or whatever they called it. Disturbed, human-managed systems weren't as interesting, or weren't as important for conservation biologists as nature was. If it weren't for people, nature would be fine, right? So that slowed down the development of the curriculum as well.

We also had the policy emphasis, and for a while we had an ecological design emphasis, but when Jim Pepper left we lost that and didn't replace it. It kind of got replaced by a combination of political economy and environmental policy. So those four areas. Trying to balance all those with a dozen faculty. It's hard to build a curriculum that is complete. That's just the restrictions that we face. But that's why, for our students, it became really important to me to get them out of the classroom and into internships. It was one of the things that pushed me to start teaching the garden class twelve years ago at College Eight, to start PICA five years ago, to get CAN going and get our students in internships in Latin America and Mexico, get them into experiences where they'd learn by doing. Even if our courses didn't give them all the background, at least they'd be operating at that level four of thinking and transition towards sustainability. And they're doing that, I think. We see it in the sustainability movement amongst the students now.

I've always believed in my teaching that it was less important to give a lot of content, and it was more important to give folks a context for *learning* content, and give them the tools they needed to know for where to go and get the content when they needed it, rather than to try and provide all of it. It seems like nowadays with the Internet and all that, it's gotten easier for folks to go and find stuff, for better or for worse. They seem much more flexible, much more adaptable with information. So you put them in a garden, and you talk about the garden as a whole agroecosystem with inputs and outputs and relationships, and internally all you can learn from that garden, with all of the concepts of agroecology, and then how that can be a place to develop a different relationship

about food and understanding about food. Then it moves out of the garden into wherever you go next, take that thinking with you. It works for a lot of them. It really does. That's where our own curriculum has developed.

After my textbook came out (and it's been used for a while, and tested), and now that it's in its second edition, agroecology curriculums are happening in other schools. You can get online and Google in "agroecology curriculum" or something like that, and boy, all kinds of stuff comes up now. It's wonderful. Our book is the primary source for some of those courses, and that's really satisfying. As we wrote the book originally, right at the beginning there's a disclaimer that says, "These are the basic concepts. It's up to the person teaching the course and the students taking it to adapt those concepts to their own situation."

Reti: That would be embedded in the very philosophy of agroecology, right?

Gliessman: Yes. But you still need to remind them, because they'll open the book and say, "Gosh, there's nothing in here about Midwest cattle or Midwestern agriculture." Well, there're a few examples, but not the detail. That's up to them to put in there, to complement it with a series of case studies, local examples, all the things they do, the situations they are under. But the approach is the same. The concepts you use of agroecology are the same. So that's worked pretty well.

Reti: Is there a network of academics who are teaching agroecology at the university level?

Gliessman: Kind of loose-knit. One thing that helped it a lot (and this was kind of fun) was that about five or six years ago at the Ecological Society of America, several of us got together and put a proposal together, and it was accepted, to establish an agroecology section within the Ecological Society of America.

Reti: Oh, great.

Gliessman: I was actually the president of it the first two years, and then I think Deborah Letourneau did it for a couple of years, which was neat, and—it grows. There're several hundred members of that section. There're conferences now at the Ecological Society of America that focus on agroecology, the role of ecology in contributing to sustainability. That's been good.

And then through the American Society of Agronomy, again, groups of people pushing agroecology, organizing symposia, putting some books together sponsored by the ASA, calling attention to the agroecosystem approach and how agroecology is important. That's all part of the network. Many of us stay close together, and collaborate, and things like that so we can keep pushing the word. So that's happening. And there are now degree programs that have agroecology in the title. People are being formally trained now as agroecologists. It varies, of course, from place to place—if you're embedded in a fairly conventional agronomy school, or if you're at something a little more alternative like Prescott College in Arizona, or Evergreen State College in Washington. Former students of ours are heading up both those programs: Tim Crews at Prescott; Martha Rosemeyer at Evergreen; now Ernesto Méndez, an agroecologist at the University of Vermont. So there's a nice network. Vermont, that's a little more

conventional school in some ways, but again, in a different part of the country where there still is more of a fabric of rural living, small farm systems, a different clientele for the work that he's doing than we have here.

Reti: Arizona is a whole other case.

Gliessman: Yes, very different. Washington, the same. Everywhere is a little different. But there're lot of big schools: Ohio State, Montana State, University of Michigan—a bunch of different places now have integrated agroecology. Many of them have started school farms and ways of getting students to get their hands on the concepts. And then a lot more food activism going on too, as we think about that level-four thinking, that level-four understanding of sustainability. Our own campus has been really good with that, with the establishment of the UCSC Food Systems Working Group, and all of the interest and commitment to greening up our food system on campus. It's fun to see our students doing that stuff.

Ultimately the idea of a curriculum here at UCSC in agroecology has to be limited, because we're not an agronomy school. We don't have that whole complex of people, specialists in all the different pieces of what a food system is. We don't have them; we'll never have them. But I think, still, despite all of that, our students come out of our program with a real good understanding of what a sustainable food system is, or needs to be. Each of them in their own way, some more completely than others, take that message with them. We see it happen. We see them come out of our undergraduate program and go on to graduate work, or become involved in community development, or go overseas, or get into

government work, or go into farming. Whatever it is. There's all this stuff they do where it spreads out.

In some ways, I guess the parallel to that is all the apprentices that have come to the program here. In their own way, they're mostly working at level two, although a lot of them think at level four. The course itself is providing all those how-tos: the complete set of practices necessary to farm organically. That's good. But the separation between the two has always been an issue, in the sense that students can't take six months out of their studies. And for what most of our students are doing, they don't need to. They're not oriented towards full-time farming. They're oriented towards being an active change agent in food systems. So you can give them that in a different way.

And that's where, again, PICA came from, and the garden classes, and all the internships, and CAN and all that—giving our students much more of an activist upbringing in what they learn. What they're learning is not just for themselves. It's for the communities that they're part of. I think that's worked real well, too. How fast can you do that work? And how quickly can you get the word out, get the people into the positions to create the change? Well, it's happening. But other stuff happens pretty fast, and it's entrenched and it takes a long time to change.

My other philosophy, too, and the way that I work, is that I've shied away from higher-level activity, like upper administration in the university, or taking on more work with consulting, or government kinds of things. I've never been very comfortable working at those levels, primarily because, although I consider myself pretty idealistic and fairly optimistic, when it comes to government and

administrations and stuff that's where I kind of go to the other side. That's where I'm quite a bit more cynical. (laughs) I've found that I just can't operate well at that level, so I go to the other direction and start one-on-one with students and in communities and build a base, and work up.

It's frustrating sometimes doing that because you're so influenced by those upper policies and upper systems. The whole idea of political ecology that I've learned about from my students and from people like David Goodman—those structures are powerful, the political and economic structures that have influences all the way down to the level of the individual, and all the way down to the level of the environment that are mostly negative, or oftentimes negative. But one of the things I also learned about the definition of political ecology is that it's that power-system-down influence that it studies, but it also opens the door for turning it around, and by knowing the impacts, to move back up again with change that will reach those systems eventually. We're less effective at that turnaround, but the structure, the way of thinking is there to do it. But it's going to take a lot of level-four work to not just get individuals and communities changing, but influencing policy at higher levels.

Reti: Things like the farm bill?

Gliessman: A lot's going on right now. There really is. It's just got to be linked to more pieces of what we call sustainability, and more people will become aware of that greater potential for change.

Roots of Change Council and the Vivid Picture Project

Reti: Let's talk about your involvement in the Roots of Change Council.

Gliessman: Gosh, that *is* a different opportunity. And it *is* working at that higher level, and I did decide to join it. When I first heard about it, it was through two of the foundations that supported our work early on—the Heller Foundation and the Columbia Foundation. The Heller Foundation and the Alf and Ruth Heller Family were so important at the beginning in connecting us to the license-plate funds and endowing the agroecology chair. When we first got the funding from the state license-plate funds, the Columbia Foundation matched that with a big chunk of money that really allowed us to equip the Farm to function. Gosh, a tractor, truck, all kinds of stuff that we got. A laboratory. We were able to outfit the laboratory that we built with the license plate funds. It was an empty building. Boy, those funds were key.

Then both those organizations, along with several others in the Bay Area, have continued to try and support the sustainable-ag movement in California. Over a period of ten, fifteen years they gave money out to a whole group of organizations that each on their own were trying to move some piece of sustainable agriculture. But after all this time of giving out this money and looking back, very little had actually changed, and the problems of agriculture were still the same problems. They weren't getting any better. So these foundations got together and decided to do something different. They agreed to pool their resources, and try and do something that was focused more on creating change at a bigger level. And it's out of this that the Roots of Change was born. They came up with the idea that they could create a synergism by not just giving more money by pooling their resources, but by supporting all these different organizations in coming up with a vision of what the change could look

like, and then once we had that vision, implement the key parts that would get us there.

To start it off, they created an advisory council. These are very knowledgeable funders in the sustainable agriculture movement, but they also wanted to have more input from a broader set of voices, a little more credibility from folks who were outside the funding arena but had experiences in a lot of the different components of the food system. And thanks to my connection with the Heller Foundation over the years, I was asked to represent the, I guess you'd call it agroecology and the alternative agriculture movement, the organic stuff. They brought in a lot of different people.

It's fun to think about how they chose the first group of us. I remember when Bruce Hirsch, the executive director of Heller, called me and explained this to me and asked if I would be willing. I said, "Gosh, this sounds pretty exciting. I'd really like to contribute." Maybe it's also because I'm getting older, thinking more about how I'd like to see change occur a little more quickly. I think what they were proposing to do is how I operate anyway, whole-system components coming together, visioning, something I guess I like to do. I don't even know if that's even the right word. It's just something I do. It's how I operate. I sort of have an idea of what something is going to look like in my mind before I do it. Then I move towards it. Some people have trouble working with me because I'm always coming up with—we can do this, we can have it this way—and sometimes I maybe can't explain exactly how I see it, or do I even know how we're going to get there. I used to have a little saying up on my wall that said basically anything you want to do, you start dreaming doing it, and that process

creates the steps and the resources that gets you to it, but you've got to do that first.

Reti: Without that vision you don't really get anywhere.

Gliessman: I was really drawn to this idea that that's what would start the Roots of Change.⁵⁰ We did have some really fantastic meetings that were well facilitated, and came up with a vision, kind of a food wheel of what are all the components of a sustainable food system, and who is involved in that process. Yet, at the same time, it was interesting how they chose the rest of the people on the committee. They thought wisely, I think, the funders did, in realizing that it couldn't just be alternative folks. They needed to have some folks closer to the mainstream, but willing and able to think outside the mainstream box, hopefully. Alice Waters, for example, of Chez Panisse up in Berkeley, was on it at the beginning, all her thinking. She's done some pretty amazing stuff. And Joan Gussow, with all the stuff she's done in nutrition and education. And a guy named Rich Rominger, who is pretty conventional as far as agriculture is concerned, a very big, mostly rice grower and some other crops in the Central Valley. He's politically relatively moderate, if not a little bit to the left, but a big grower. He served in Clinton's cabinet as deputy secretary of agriculture. He's been a [University of California] regent. He's done a lot of stuff. He's very Californian, many generations. He sees the crisis that agriculture is in in California, and is looking for alternatives. He's been an advisor to the UC SAREP. He's been very much involved with UC Davis. He's not faculty; he's a farmer. He's a very active, engaged, and civic-minded farmer, yet he'll continue to think about markets as the key thing, and that we've got to include all farmers

in this process. I say, well, a lot of those farmers have unfair advantages. It's not a level playing field. We've got to make some real changes that disfavor certain farmers and favor others, and give the farm workers a stronger voice. We don't always agree on things, but that's the way it is with some other folks in the group as well.

So they hired a group, Ecotrust, out of Oregon, that created this whole thing called the Salmon Nation that has had a lot of influence on watershed management and fisheries up there, hired them on to create this Vivid Picture, it was called, of the future of food systems in California. It was very interesting, too, how early on we all realized that sustainable agriculture was not broad enough, that it was too focused on the production side, that we really needed to talk about sustainable food systems. I'd already reached that in my own thinking. You can look at the subtitle of my first edition and then the second edition of my book, and I had shifted over completely in there as well, as a way to reach more people, and to reach more parts of the food system in this change process. I know when I first started doing agroecology, I'd had experiences in a lot of the different parts of the food system, but a lot of my work was very much focused on production, and alternative methods of production. It grew. It had to, as you find the limits to that. It's necessary. It's important. It's a place to begin. But you've got to go beyond that for change.

So we did shift over to food systems, and that's been good, I think. It's allowed us to bring in more of the voices of what a sustainable food system could be, and needs to be. The biggest problem with something like Roots of Change, though, is: how do you choose what to do, and who to fund to do it, with the hope that it's

going to be the right choice that's going to really create change? It's such a challenge, and everybody has got their favorites, or got their ways of thinking, got their experiences. I've found myself sometimes being a lone voice in the Council for thinking holistically and trying to act that way, rather than focusing in too much on individual pieces, and in the process losing sight of what I call the change process. I know I insisted that we as a group discuss, and even get some training in, what I was calling social movement theory, social change processes, that this is really what we're talking about. I tried to explain level-four thinking, and how we needed to have that, when others were saying, "Well, let's get all the people in the food system at the table talking to one another, and then they'll all understand that we've got to change."

Reti: (laughter)

Gliessman: I'd say, "Yes, but those people are professionals when they get at a table, at getting their way and not changing. How are you going to keep that from happening?" I've been saying, "They don't need support. They've had control all along. We need to support the voices that haven't had support, the ones who can build this coalition between the people who grow food and the people who eat it." And when I say, "who grow" it's not just the farmers. It's the people who do the work of growing. And there're a lot of them out there. They're all of the voices that don't get incorporated into this process, so that in California we can develop a culture of agriculture again, rather than just agribusiness. California is pretty unique, in the sense that if you go back into the history of the development of agriculture in this state, from early on it was captured by business, the Gold Rush, a whole lot of people out here needed food,

and a whole lot of people took advantage of the fact that they needed food and started businesses, contract growing, monocultures, all that kind of stuff. We didn't go through very much of a settlement, of an agrarian movement.

Reti: With small family farms?

Gliessman: Yes. That kind of got as far as Denver and then stopped. The rest of it, especially California, was a whole different process. That's been documented pretty well. This book really covers it: *The Conquest of Bread: 150 Years of Agribusiness in California* by Richard Walker.⁵¹ It's amazing what he's done of laying that stage. And knowing that, we have to use a whole different approach to change it. Because that system is so entrenched, that they own the system, and they even own the University [of California].

Reti: The University is part of that whole history.

Gliessman: So we got a lot of work to do. I have stayed committed to trying to be involved in Roots of Change, but part of my problem is time. At first it was an advisory role. We met twice a year and we gave them ideas, and then you go home and go back to work, all the teaching and stuff I do. But it's evolved into this thing where the time that's required of the advisory council— In fact, they've changed the name of it. We're now the sustainability council, or some new name. And the time necessary to fill that role, because we're not just advising, we're making decisions. We're developing the program.

Reti: Deciding about funding proposals?

Gliessman: Yes, what are we going to fund? And how are we going to evaluate the steps? What a lot of this is requiring is being very public, and being right out in front pushing the movement. And to find time to do that. I was supposed to be at something tonight, up to Sacramento just for the evening. I can't do it. So I'm not going. But to really be an effective member of the council, I've got to find ways to do this stuff more. I don't know. I'm a little concerned about how much of a role I'm going to be able to play. If I retired— A lot of the people on the council are retired, and they can devote lots of time. Or else— Jim Cochran is on the council as a farmer voice.

Reti: Now, there's another busy person.

Gliessman: He's made room for it. Since he's in business and takes time away from his work, he gets compensated to do it. I don't. I'm a full-time employee, and so I've got to keep my full-time employment going plus do this extra job. It's hard when so many other things are going on. But people ask me about it, about Roots of Change, and I tell them, "We've got to support this." Because it's almost our last shot, or it's the best shot we've had in a long time, if ever, to truly re-shape the systems in this state. It's that big. It really is. That's what it's all about. You look at the Vivid Picture (it's online)⁵² of what agriculture could look like in the year 2030. It's not what it is now. The question is, how do we get there? I have really enjoyed working with the development of that vision. We want to do what they call backcasting, where you have that vision, and then you kind of look from the present to the future, and then backcast to now to figure out what needs to change, and how to change it to get there.

It's the same idea of having a vision of where you want to get, rather than doing things without one. Or at least a different vision from what exists today. A lot of agricultural research is dealing with what we have today, trying to solve today's problems, without thinking about where we need to get. It's not even at level three, redesigning the system. It's almost like you need level four right at the beginning in order to re-shape the kind of work we do at either of the other three levels. Because without that change in vision, change in ethics and values, and change in understanding of what sustainable food systems is, you're going to keep doing the same thing.

Reti: You can't just add level four in and stir at the end.

Gliessman: No. So how do you frontload it? The vision, the change of thinking right at the start is what has to happen. Now, that's not easy to do, but it seems to me, looking at social change and social movements overall, that the folks who were most important in those movements always did have a vision. They didn't know how to get there, but the vision helped them find them the way. Depending on just how strong they were, how many they were, what kind of resources they had, they could go further faster or not. But many of those movements encountered very strong resistance.

Reti: Well, that's the issue.

Gliessman: And that's the issue. I'm concerned right now some about resistance to this new vision from the status quo. But I'm also worried about co-option. I've seen it happen many times. I've seen co-option occur. I'm worried about co-option with agroecology. I've seen some places that use agroecology as a way to

do what they've been doing, where they define sustainability as: "Well, heck, we've been doing this for two hundred years and we'll keep doing it that way. If we've been farming conventionally for two hundred years it must be sustainable. We don't have to change anything." But it's a different set of criteria. It's co-opting the term. "Sustainability" has struggled as a term because it's used in so many different ways, and it is easy to co-opt.

Organic is being co-opted by Whole Foods, by the large growers who see a market. How do you keep that from happening? I again find my role on the council to continually call attention to this problem and how we need to be aware of how it always happens. They even got this [term] (I didn't like it all; I still don't) that what we're going to try to develop is "a new mainstream." I mean, I understand that they want this vision to be the mainstream, to be what everybody does. But I'm not sure— (sigh) I don't know, it just doesn't feel right, like the way to get to the vision [is] by thinking about mainstream now. It's obviously saying it's what we want to get to. It is new. It's something we don't have. But working with the current "mainstream" to get to the new mainstream, the potential for co-option is just too great. We need to start now with the alternatives, with the new relationships, with the new connections in the food system, and support those. If the mainstream wants to join us, fine. But we shouldn't put any resources into trying to convince them. Let's work with the new parts of the system in what's going to be the new mainstream instead. It's how I think about it.

Reti: Like food citizenship.

Gliessman: Yes. We'll see. But, like I say, it's the best opportunity we've had. And the funders, and us too, are starting to try to raise more funds in order to really have influence. Right now, a couple of million a year, for something as big as this, is nothing.

Reti: When you compare it with how much money agribusiness has.

Gliessman: Yes, exactly. That's the whole point. We need, for example, to hire a fleet of media experts and start a blitz campaign on whatever media people listen to. But for something like that we have to have a story to tell that's convincing, that reaches people. They use them all the time. Gosh, I don't watch television. Haven't for years. I can't stand it. But that's the media, how you get the word out there. Well, it will be interesting to see, and I'll do what I can do. But again, I feel like the work I do here in teaching, and building the networks, and getting the word out about agroecology to people who can use it, training them and giving them the capacity to do it, that's my key role.

Robbie Jaffe [part two]

Now let me talk about my wife, Robbie Jaffe.⁵³ She's been such a big piece of all of this. This goes back to when we were talking about curriculum development. It reminded me that one of the first things I did with agroecology when I was teaching it (I think I did it the second year, in the fall of 1981), I decided that I didn't want to just do the labs at the Farm, although we were doing them in the greenhouse. I didn't have a lab or anything to work out of. But I had already gotten my bus license for the university's old blue buses we had at that time. They were old *then*. We used them for Field Quarter. I was one of the Field

Quarter drivers. But since I had my bus driver's license, I thought, well, let's take the agroecology class into the community, and see some of the things that are going on in alternative agriculture. We went to a couple of farms. But one of the places that one of my students told me about was Green Acres School, where there was the beginnings of Life Lab. I'd heard about this program. It sounded pretty interesting. The students had been there as interns helping run this program. So we went there, and of course the person who was the director of it was Robbie. That's when I first met her, was on one of these field trips, when she showed us around the program. She was teaching at that time, and was the Life Lab teacher for Green Acres. I liked the program a lot, and the garden was beautiful. They had built community support for it. They'd built a barn with help from the community, and this whole garden ecosystem was thriving at this school.

It was actually an intern that I sponsored to work with Life Lab that got me to the school. It was actually three students, but one of them in particular had this idea to help raise a little additional money for the program and to give the students another experience at Green Acres School. They decided to take the produce from the school garden to the farmers' market and have the kids sell it. These three interns organized it. Well, it turns out one of those three students was Drew Goodman [now co-owner of Earthbound Farms]—⁵⁴

Reti: Oh, my goodness!

Gliessman: (laughs) —who is way off now in organic production, and a big time mainstream organic grower. Pretty fascinating that he got his start in the Life Lab garden. (laughs)

Robbie, I guess, at that time too, was thinking about going back to school. She had gotten her undergraduate degree in sociology in Florida, and done several different things. After she got her degree, she worked a bit for Cesar Chavez's group in Florida, and did some research amongst small farmers in Wisconsin, did a couple of things before she hooked up with a guy whose father owned a piece of land in Elkhorn, a big piece of land. So Robbie and this guy, Jerry Kay, he started General Feed and Seed, they were together and came out and kind of homesteaded on this piece of land, and put a little farm in. I guess that all fell apart after a couple of years, the relationship and the farm, and Robbie ended up going back to teaching. After that farm experience and her social activism stuff, she got very much involved when they were putting the legislation together to create certified farmers' markets. She worked a lot on that, and had a lot to do with getting the Cabrillo Farmers' Market started. That led her into teaching as well, and brought this idea of a garden to the school, which fit very nicely with the agroecology stuff that we were starting to do here, a good place to get our students involved.

But she was also at a point, after having done that for a couple of years, of thinking about going back to school. I had just gotten my first crew of master's students through biology. But her background wouldn't let her come in through biology.

Reti: She had a teaching background, not a science background.

Gliessman: So what she did instead was build on her teaching skills. We went to Art Pearl and Ellen Moir in the Education Department, and had her come in through education. I would be co-advisor with Art Pearl and Ellen. What she would work on, what her thesis project ended up being, and I guess it started in '83, was to take over the teaching of that course that I struggled with, *Principles of Sustainable Agriculture*. I was teaching it; she was the TA. But I basically turned it over to her, and she turned her master's thesis into a topic: "Dealing with Conflict in the Classroom, the case of Sustainable Agriculture." She set it up so that she had people from conventional and organic agriculture coming to the class and presenting both sides of the issue at that time when sustainability was just starting to come forward. Had lots of classroom discussions, and panels, and readings through a range of topics that she completely organized, so that students in the end could make their own choices. She got her master's thesis out of that. I was still married at that time to Nanette, and lived at Molino Creek up there. As far as I knew everything was going okay. It was interesting, having lived in Latin America for ten years; the two of us, Nanette and myself, were completely isolated from everything going on up here culturally through the seventies, from 1972-80, eight, nine years in there. That was a pretty dramatic time.

Reti: It sure was.

Gliessman: (laughs) And we were off down in Latin America immersed in Latin American culture. I was busy with doing all the stuff I did, and she had her stuff,

and we adopted two kids while we were down there, one in Guadalajara and another one in Tabasco. That was a pretty big piece of our lives, along with the other stuff going on. When we came back here after having been gone for so long, I was just head over heels into developing agroecology here, and working at Molino Creek, and doing all this stuff. Nanette, I think, realized that something was missing from her life, so she decided to strike out on her own. This happened in 1983. It hit me pretty darn hard. I just— I didn't know quite what to do about it.

Reti: I bet.

Gliessman: But I also, I remember at that time, right about that time I did— You ever heard of Justin Sterling?

Reti: No.

Gliessman: It was one of those things at the time of EST: Men, Sex and Power, and Women, Sex and Power. These workshops. Crazy stuff. Well, I did one of those things. And out of that I got into a men's group. Six of us. And from that point on, up until, gosh, maybe five or six years ago, we met all the time. I'm still in touch, and we get together for little reunions once in a while, this group of guys from real diverse backgrounds and real supportive of one another. During that time that group was real important to me. Crazy bunch.

Robbie finished her master's in the spring of '85. By that time Nanette and I had finalized our divorce, and I was at a point where I didn't want anything to do

with relationships. But then, at the same time I envisioned, if I were going to get in one what it would look like. I made this little list of things.

Reti: The visioning thing again. (laughs)

Gliessman: (laughter) Yet I still didn't have anybody to put into it. And this is when OTS at the end of 1984, asked me to organize the first tropical agroecology course in Costa Rica. I needed a TA. Robbie came to me and asked if she could be that TA. She'd heard about the course. I still hadn't found anybody. I'd had the experience of her co-teaching that course for her master's, and I thought yes, that kind of focus would really add to the course. So I said yes.

She went to Costa Rica a couple of days ahead of me, before the course began, and I showed up the day before the course was to begin. I don't know what it was, something about being out of California in another place, but almost immediately we fell in love. And the rest is history, in a sense. She as a TA in that course played a critical role in its success, and it was our first foray into partnership in sustainable ag and agroecology as we made that course happen. It was really a remarkable course. Personally, I don't think they've ever achieved the same level of, I don't know, completeness, as we did in that first course.

We came back here, and that's when I decided to move out of Molino Creek, and sell my part. The two of us ended up renting a little cabin on Scott Creek from the McCrarys out at Big Creek Lumber. We lived out there for almost ten years. We rebuilt the little place.

Robbie was still with Life Lab, and Life Lab was gearing up.⁵⁵ They'd done this whole curriculum and had gotten it published. What we did then, was set it up so that Life Lab could move its facilities to the Farm. They got a big grant. They were able to buy the trailer that they're in today. I worked the university system so that they could get it moved on campus. That was another one of those little things where I sort of got my hand slapped for doing it. But it was done. And it's been a big piece of their program. She, for the next fifteen years, was the executive director of Life Lab and helped it grow and take on all sorts of stuff that they were doing—NSF grants and working with UCOP [University of California Office of the President] with teacher training programs and teacher development stuff, way beyond just the garden.

Reti: It's become a national program.

Gliessman: Yes, really big stuff. We're constantly doing really related stuff, but part of my vision of a relationship would be a partnership where we would actually share things together, too. So I did that a bit by being an advisor to Life Lab for their curriculum development, and working with their LASERS program, an NSF-funded program called Language Acquisition in Science Education in Rural Schools, garden-based learning things that they set up for elementary schools down through the Salinas Valley. We could always sit down and go back and forth about stuff. I know many times she'd get tired of hearing about all the hassles at the university, because I'd come home and unload because I didn't have anyplace else to do it. Of course a lot of our time was raising the two kids, because they were mostly with us. She just loved it, built a relationship with them both right away, and that's been there ever since.

Most of our extra time during those first years was soccer practices. I was a coach and all that kind of stuff. You do it with kids. I had fun doing it. Then when that started to get past, and the kids were moving into junior high, high school, we'd go to football games and watch the older kid be on the football team at Santa Cruz High, and that was fun. But, my brother— This is sort of merging into Condor's Hope.

Condor's Hope

Reti: That's fine.

Gliessman: My brother was working for a guy down in Santa Barbara that had a little commercial retail nursery business, wholesale retail to the public. And this guy one day was over in the Cuyama Valley in the north part of Santa Barbara County, driving along Highway 166, saw a little for-sale sign alongside of the road, and drove the four or five miles up this canyon road to this little place for sale—twenty acres with a ranch house and some open land. He decided to buy it, and fix it up, and would go over there and take some of his friends over, and shoot quail and drink beer, and just have a good time. My brother went over there, and got involved, and helped him fix up the place a little bit. He invited me and Robbie down one time to see the place when he was there alone, without his boss there. His boss let him use it whenever he wanted to. I immediately fell in love with the place, the location. After having left Molino Creek at the end of '85, I missed having a place to farm of my own. I could get a little of it at UCSC, but it wasn't the same. A feeling that I had when I was farming in Costa Rica, a feeling that I had when I was farming at Molino Creek, and I missed it. I guess I

just saw this little place, didn't even know especially what could happen, but I know I told Eric, my brother, that if he ever heard, or if his boss ever heard of any other places for sale in there to let us know.

Well, about a year later his boss decided to sell the place. So my brother, and Robbie, and I, the three of us, formed a partnership. We struggled to find the funding, but first of all, there was a little partnership with his boss, who stayed part owner until we could find other financing and then take it over. About a year later we finally did. We think back now: twenty acres with a house and barns and a well. \$150,000. But you know, it was a lot of money.

Reti: It was a lot of money then. It's just only now that it seems insanely cheap.

Gliessman: Well, it's out there in nowhere, off the grid and all that kind of stuff. And almost right away we started thinking about grapes, something I had always wanted to do. I'd wanted to do it at Molino Creek, but I didn't have time, and we were focused on the dry-farmed tomatoes and making all that work. So there was never an opportunity to do them. So that's what came to our mind. We did our first planting in '95, a little experimental planting of about 150 plants, and geared up for a larger planting based on what we learned with that. Finally in 1998 we planted four acres worth of grapes, and a couple of years later interspersed olives amongst them. It was really fun sharing it with Robbie, and as much as we could with my brother. But then my brother got in a relationship with a lady who wasn't as interested in that kind of stuff, and Eric had very limited funds to invest in the ranch. A year or two after we planted the grapes originally, we bought my brother out. So it was just Robbie and me.

But we went on, and the grapes grew, and we got into a thing where when pruning time would come we'd put out the word to a network of friends and family, and mostly students here. PICA had started by that time, and I had a close relationship with the PICANS just because of all the stuff we were doing together. I'd say, "Hey, you guys want to come down and prune?" Down they'd come. We'd have fifteen or twenty people down there on President's Day weekend, and I'd train them on pruning. I'd explain the way we were growing the grapes, and basically practicing what I preach by having a place where I could, not just grow things, but share the process of doing it and how I do it with other people, so they could see and learn from it, and then have fun with food and music and wine, and go beyond the work, and build that relationship at a whole other level. Really special times. Harvest is the same way, where we put out the word to a network and see who shows up. We have a ball. It's so much fun. You'll have to come join us for a harvest.

Reti: I'd love to!

Gliessman: God, we have fun. (laughs)

Reti: You were making olive oil this year.

Gliessman: Yes, we did this year for the first time.

Reti: Sarah Rabkin was telling me about that.

Gliessman: Yes, that was great fun. We had a little over seven hundred pounds of olive fruit, and made fifteen gallons of oil. That was really nice. Good stuff!

I'm still eating it. We've turned it into a little family business, where we've got all our permits and licenses and labels, and we now sell wine.

Reti: I saw you have it on the Web.

Gliessman: Yes, we got a website, CondorsHope.com. When we were first planting our grapes and didn't really have a name for the place yet, they had begun releasing some of the captive-bred condors just a couple of canyons to the east of us. They frequently would fly over the farm. If you went up on the ridgetop behind us, and drove along the ridge, why, you'd see them all the time flying along the ridgetop. I'd always thought condors were cool anyway, and we turned it into a name, Condor's Hope.

When it first started, why, during Field Quarter, another tradition was that we'd go out to Santa Cruz Island. Well, either a few days before or a few days after, I'd bring the whole Field Quarter group to the ranch. We'd actually camp at the ranch, and we'd explore the mainland chaparral and oak woodlands either before or after going out to the Island and seeing it there, and have a way to compare and contrast. I took them up on the mountains and we'd try to see the condors. But I guess after four or five years of releasing, or six years of releasing them up there, they finally had to back off doing it there, and [move] the release sites to some other places, because there's a lot of hunting in that area, and the biggest problem that the condors are facing in the open wild right now is the fact that lead from bullets, fragments, the tiniest fragment is lethal! They have no tolerance at all. Zero. They were all dying of lead poisoning. So they've had to move them to other places where that's, not eliminated completely, but much

less of a problem as it is up in that region. We see them less often now. They're starting to fly longer distances. We see them occasionally. They'll come back eventually. There're movements afoot to try and get lead out of bullets and pass legislation that will hopefully remove that stuff from the environment.⁵⁶ But boy, what a process.

We're producing what, 350, 400 cases of wine a year now and it's good wine. It's really good stuff. About four months ago we started selling it at the Westside Farmers' Market. My son and his girlfriend are in charge of that market. It's fun to have him be a part of it. In the last several years he's gotten into the place, and he's so good with tools and machines and equipment. I can just put him on the tractor and I know he'll do all the work. He does it better than I do. I just love him out there doing it all, and sharing it. He's really gotten into all that part of what we do, plus the marketing now.

Reti: Is he interested in agroecology?

Gliessman: No, not really.

Reti: Just the farming part.

Gliessman: Yes, and sharing it with family, which is, again, part of the vision of it all. So we've shared that, Robbie and I have, and try and cram that in along with everything else. It's five hours, four and a half hours away. So we're on the road a lot, back and forth, because we don't hire anybody to do it. We do it ourselves. Fortunately, there's peaks of work and times in between when it doesn't take so much, and harvest is in the summer when I'm not in school, so I

can be down there most of the hot part of summer. It's kind of cool, get away from the fog.

Reti: You like it out there.

Gliessman: Oh, I love it. Always have.

Robbie and I went off in 2001 to the Yucatán on a Fulbright and a sabbatical. She took a sabbatical from Life Lab. We did it together. While we were gone she decided to retire from Life Lab. She'd been at it for twenty years. She was ready for a change. We thought that if she did go back to work, she'd only do it part time, and have more time to work with the ranch, and share other things together. The idea of CAN that developed during that sabbatical. That became that project together that we'd been looking for for a while. It is wonderful how we complement each other and work together with it, I think, really really well. And as we brought it back here and developed the student group of interns and volunteers that do the work of CAN here, she really works with them well. It's fun seeing her in that mentoring, teaching role. I like to watch when that's going on. And then building the whole alternative market for the coffee, and finding the funding to keep CAN together as a nonprofit. It's been a big job. She does it volunteer, all of it.

Reti: I didn't know that.

Gliessman: Yes. Because after she got back from our sabbatical, I guess it was Ellen Moir of the New Teacher Center, who is a good friend of Robbie's anyway, asked her to come do a consulting job and help write a grant to NSF. Robbie

wrote it and wrote herself in for a half-time salary. And they got it. They're in their fourth or fifth year of a thing called EMSS. I don't know if I mentioned it or not.

Reti: I don't think so.

Gliessman: E mentoring for student success. EMSS. It's a web-based mentoring program for new teachers in science and math, where they're teamed up with a veteran teacher. It's for middle school and high school. It's for new teachers fresh out of their teaching credential programs that usually almost always get dumped into a difficult teaching situation with very little support. That's why forty to fifty percent of new teachers don't last more than the first two years and never go back to teaching.

Reti: I had no idea it was that high!

Gliessman: Yes. It's crazy, a crazy system. So this program has really turned out to be highly successful and she's the program manager. She's now up to seventy-five or eighty percent time on it. It's a collaboration of the National Science Teachers Association, the University of Montana, and the New Teacher Center here at UCSC. It's in sixteen states now, and there's a network of literally thousands of teachers. She's enjoyed it, but she's kind of overwhelmed by it. It's more mechanical keeping it all going now, and she's thinking maybe it's time to retire again. But we're talking about continuing CAN, and CAN's link to PICA here, with a local versus international opportunity for agroecology in community, and how maybe there's a way together that we can make all that happen. We'll see. We are looking at some potential different options right now

where she could become more fully involved in that and we'd work together on it more.⁵⁷

Whenever you work together with somebody closely on something and they are also your partner, issues always occur and arise. Things go smoothly usually and sometimes not so smoothly. But I think it's that longer-term vision of the relationship, the partnership that you share that helps you through those times. I look back now. This summer we will have been married twenty-one years. It's been a good time, and there're lots more good times still to come. Being able to share agroecology with Robbie all these years has been, I think, an essential part of it all being possible.

Reti: For you.

Gliessman: Yes, for me. To have that total and full support, yet also a critical eye. She's not afraid to tell me when I'm blowing it, (laughs) and at the same time encourage me to think about different ways to solve problems, or deal with people, or whatever it might be. When I felt like I had been removed as the director, her presence was critical in getting me through that time. I don't think I could have gone through it without her. That was pretty important. It's been a great journey.

A Sustainable Living Curriculum

And it ain't over yet. There's still lots more to do. I got some visions of what I—
The idea about a curriculum, it's taken a different form now. It's a sustainable living curriculum instead of an agroecology curriculum. It's connected to a bigger piece of sustainability, food systems being part of that, but people in

community together is the other part of it. And peak oil⁵⁸ is part of it. All these things that I think our students are constantly being barraged with, are aware of, want to do something about. Because it's their future.

Reti: Absolutely.

Gliessman: And we, as faculty, are trying to wake up to this realization that they want a different curriculum than we're offering. I really believe it. And I think it's happening. On our own campus, for example, right now, with interest on the part of the faculty to engage in sustainability in their courses, to become part of the student movement that's been so powerful with ESLP [Education for Sustainable Living Project], the Student Environmental Center, the Food Systems Working Group—the stuff they're doing is amazing. And the annual environmental summit that they hold that engages the campus in a greening process, that I don't think that they would have done if it hadn't been for the student influence. Being a faculty member that's supportive of that with students, I've been one of the main faculty advisors for ESLP the last four years. I just entered all the grades for almost two hundred students. It's courses sponsored by the Student Environmental Center, organized by students, but listed as College Eight courses. They just found a place that they could list it in the *Schedule of Classes*. And thanks to people like Barbara Lawrence, and Joyce Rice, and a supportive college, on the part of the provost— The provost who was most supportive at the beginning was Roz Spafford. Ravi Rajan continues to be supportive. And even before Roz, Andy Szasz was supportive of the idea too. So they got a home. They got a place they could start. They just needed to get a faculty of record.

Reti: There was this long association between College Eight and environmental studies at UCSC.

Gliessman: Right. And I had been at College Eight since the beginning as well. So they came to me, and they came to John Borrego. Both of us have said yes. So you look in the *Schedule of Classes* under College Eight 61 and College Eight 161, and he or I are listed as the faculty of record. I don't even think environmental studies knows it, because it's certainly not part of my teaching load over there, but that's okay. It's been great to see it happen. I did it because the stuff we were doing with PICA and CAN fit right in, and I supported it completely. The extra work has been really worth it, seeing it start, and seeing several other faculty start to come forward, to respond. They see this course being taught, and realize, hey, wait a minute. There's something out there. So people like Ronnie Lipschutz, and Melanie Du Puis, and Ali Shakouri in Engineering—we've started talking about a sustainability minor.

Reti: I was wondering if this was headed towards something like that.

Gliessman: Yes. We realize you don't just establish a minor from one day to the next. What I like about working with this team is that instead of waiting for something to happen, we just do it. So we put a course together, and we're getting permission for fall quarter to start teaching a course on sustainable engineering and ecological design, or something like that. It doesn't matter what it's called. Students will come to it. It will be kind of a precursor to ESLP in the winter and the spring. That course has four hundred students enrolled in it, [and is] two units. They meet every Monday night. The ESLP has funds bringing

pretty well-known speakers in sustainability who come every week, a great list of folks have come who motivate the kids. Then the upper-division folks form action research teams, ARTs they call them, with a facilitator. And they now train themselves in how to facilitate, and they choose topics that are oriented towards change.

That's where the action piece of it comes in. We try to get faculty advisors in to give them some input, and also as a way to get faculty involved and affect faculty. I think that's where it's started to pull faculty in, more than anything else. They've taken on things like campus composting, and campus recycling, and campus transportation, and the campus food, and sustainable curriculum. They spend a whole quarter exploring it and meeting with people, and have a report at the end about what action that they were able to take. It's remarkable, just remarkable what they've done with it. I love it.

So even environmental studies now has recognized that sustainability amongst our students is in demand, and that if anyplace, if *anyplace* it should be going on, why, environmental studies is the place. Some of the department doesn't like it when I say we're not doing it. They think that the stuff they're doing is a part of sustainability, and it probably is. But what it doesn't have is the action piece, the social change piece, the hands-on learning piece, the student engagement and activism piece. There is a real resistance on the part of our faculty to be connected with activism. I think that's true across our campus. Maybe there's advocacy going on, but there's not activism. And to really create action for change, that's part of what we do. I think our students are back at it again after a little lapse.

Things [are] sort of collapsing around us, it feels like sometimes, in terms of the quality of the environment we live in and its ability to support us. It's phenomenal. The evidence just keeps mounting, too. What I always talk about is, rather than studying what's going to happen with global climate change, we need to be making different choices about how we live, in order to reverse the process.

Reti: We have so much information about different possible scenarios.

Gliessman: But it's fascinating to me that to promote or advocate change in, say, transportation systems, or the way food is grown, to really advocate for it, is considered activism, and not something that we as academics should be engaged in.

Reti: But if we study it, then that's okay.

Gliessman: Yes. But our students want to do more than that, because they, almost better than we, sense the urgency of it. So the idea of a sustainability minor has come forward, because it's something that we could house in any department, really, as long as there's one that's willing to manage it. Right now the department that seems to be more open to doing it is engineering. They're seeing tons of opportunities in the design of technologies that will help green up what we do. Tons of stuff. I mean, that's what they do. Students are into it. And they have had trouble maintaining enrollments in engineering. They have this whole school and hardly any students in it. This is a way to attract that student mass.

Maybe environmental studies will come back around and decide it wants it. I don't know. There're lots of different ways. I don't care. If we could have a curriculum where they get introduced to the idea of sustainability, have opportunities to engage in it, from PICA to community stuff, whatever it is, this area here could potentially become the hands-on learning center for all that. That's one of the other things. So that no matter what your major, is you could have this sustainability minor and take it with you. Art, computer science, biology—whatever it is, you'd have this whole exposure to how we can affect the earth every day through how we live. That's what some of us are working towards right now. We'll see what happens. And that, like I say, for the next few years is what will engage me. I'd love to see in the end this place become a center for sustainable living, and that every 152 beds in the Village is occupied by a PICAn and we retrofit this whole area to express how to do that. Anyway, that will keep us busy. (laughs)

Reti: That's very inspiring.

Gliessman: It's good stuff. And then of course Condor's Hope will continue to mature, and CAN will continue to mature. I can see it [eventually] being spawned off to one of the younger CAN folks at another university, so it takes on another life at a different place, but keeps going as an organization. Who knows? Right now I think if Robbie and I both stopped doing CAN, CAN would cease to exist. But we're in a transition period where there are folks that are part of our CAN group, CAN researchers, CAN advisors that are almost ready and are in positions where they can keep it going. In keeping it going it allows them to do the work they want to do in terms of action research and action education.

I guess it's also appropriate that this year our International Short Course's subtitle is "Action Education and Training in Agriculture and Community." We've partnered up with Heifer International. They're a co-sponsor of the course. A bunch of their program directors at community agroecology projects they're doing around the country are going to be taking the course. It's going to be fun to together explore how we turn agroecology into action through the teaching and training that we all do. We teach them the basic principles, and our CAN team is going to stand up there, and my group of grad students (they're not grad students anymore) but that team that's "The Mafia" (maybe that's a better way to say it.) Everything that we do is going to be presented in that context. How has this been working? Is it effective? Is it creating the change? And if not, how do we adjust it in our teaching and training, so that it does add to that change, and provide a model for doing that? Boy, that's going to be fun. I'm really excited about it!

Reflecting back, and thinking about all the pieces of what's been agroecology and how it's unfolded for me over the years, I remember when I wrote the preface to the first edition of my book. It was the first time I ever sat down and deeply reflected on each of those steps, how one thing led to the next, and ended up in that book. I'll pick it up every once in a while and I'll read it to remind myself, just to feel that connection again. And sometimes when I do, it gives me a bit of inspiration as to what the next steps might be.

Reti: From here?

Gliessman: Yes. Or could be, for someone else. A student will ask me, “What am I going to do?” or “What do I do?” or, “What should I do next? I need to know if I’m going to get a job,” or something like that. And I’ll oftentimes reflect with them a little bit on my own experience. I don’t know if that’s fair or not. But I’ve found it useful just to think—well, gosh, I don’t know. I didn’t know what I was going to do when I did this, or went from here to there, or when I did it felt the right thing to do. I didn’t know how long it would last, but I didn’t even think about that part. I just said, well this is the next thing to do, and as long as I’m supposed to do it I’ll be here doing it.

And you know, going to Costa Rica, going to Guadalajara, or going down to Tabasco—each one of them had its time period, but was an important step to the next thing, and the next thing wouldn’t have happened without that step. And then ending up here, and having been here now for so long. God, twenty-seven years! It’s been a good time. And it sure hasn’t been the same for those twenty-seven years. There’ve been lots of different things going on. That’s been good. It was fun thinking about how it almost did change there, when I almost decided to leave this place. Glad I didn’t. I think Condor’s Hope, in some ways, kept me here when a couple of opportunities to go somewhere else came up.

Reti: Oh, where you wouldn’t have been able to be within five hours of the ranch.

Gliessman: Yes, that piece held me here. And Robbie, too. She had her stuff that she’s doing here, and it would have been really difficult for her to leave that. So that was all part of it as well. Looking back, it’s amazing how each piece led to

the next piece, each step led to the next step. I don't know how it could have been planned. But every one of them has been connected. It's remarkable how that's happened.

Reti: It's been remarkable to hear the story unfold through this oral history.

Thank you, Steve.

¹The Natural History Field Quarter is an integral part of the Natural History Pathway within the environmental studies major at UC Santa Cruz, and was founded by Professor Kenneth Norris in 1975. Steve Gliessman has taught this 15-unit course for many years. According to the UC Natural Reserve System's website: "Field Quarter takes students on a natural history journey across the state. Though the exact itinerary changes from year to year, the trip always begins in the Mojave Desert at Sweeney Granite Mountains Desert Research Center and moves northward with stops that might include the Channel Islands at Santa Cruz Island Reserve, the Big Sur coast at Landels-Hill Big Creek Reserve, the Carmel Valley at Hastings Natural History Reservation, and the redwoods of Mendocino County at Angelo Coast Range Reserve, before ending in the Sierra Nevada mountains." Gliessman was interviewed by the Regional History Project about teaching the Natural History Field Quarter as part of an oral history on Kenneth Norris. See <http://library.ucsc.edu/reg-hist/norris.html>

² Allelopathy is the inhibition of growth of a plant due to biomolecules released by another.

³ The Green Revolution began post-World War II, when plant breeder and soil scientist Norman Borlaug spearheaded a Rockefeller Foundation-funded program to increase yields of wheat in Mexico. The term itself was coined by U.S. Agency for International Development director William Gaud in 1968, and referred to the attempt to increase crop yields through variety of agricultural technologies including irrigation, "genetically improved" hybrid seeds, petrochemical fertilizers and pesticides, and mechanization. The Green Revolution has been widely criticized by environmentalists, including agroecologists, for its dependence on petroleum-based fertilizers and large-scale irrigation projects, and for promoting monocultures and loss of genetic diversity.

⁴ The seed packet was from Cooperativa Agroecología Nacional Terra e Vida, Ltda. Candiota, Rio Grande do Sur, Brasil.

⁵ Dan Janzen, "Tropical Agroecosystems," *Science* (1973), 182:1212-1219.

⁶ Norman Borlaug died September 12, 2009.

⁷ Steve Gliessman, editor, *Agroecosistemas con énfasis en el estudio de tecnología agrícola tradicional*. H. Cárdenas, Tabasco, México. 1978. pp. 216.

⁸ See the oral history documenting the UCSC Arboretum at <http://library.ucsc.edu/reg-hist/arboretum.html>

⁹ See Maya Hagege and Randall Jarrell, *The Early History of UCSC's Farm and Garden* (Regional History Project, UCSC, 2003) for an interview with Dennis Tamura.

¹⁰ The interviewer was an undergraduate student in environmental studies at UCSC at that time.

¹¹ G.W. Cox and M.D. Atkins, *Agricultural Ecology*, (W.H. Freeman & Co, 1979).

¹² See Irene Reti and Randall Jarrell, *Jim Pepper & The Evolution of Environmental Studies at UC Santa Cruz* (Regional History Project, UCSC, 2007).

¹³ See the oral history with Sam Farr in this series.

¹⁴ See the oral histories in this series with Jim Nelson, Beth Benjamin, Steve Kaffka, Orin Martin, Heidi Skolnik, and Wendy Krupnick for more on the Chadwick era at the UCSC Farm and Garden.

¹⁵ In 1979, California Rural Legal Assistance filed a lawsuit against the University of California on behalf of the California Agrarian Project and seventeen farm workers, arguing that the mechanical tomato harvester, invented by UC in the 1960s, misused land grant research funds

provided by taxpayers because it resulted in the elimination of agricultural jobs. This became known as the research priorities (or mechanization or tomato harvester) lawsuit. According to *Science Magazine*, "The lawsuit also claims that mechanization research is counter to federal land grant acts, which, according to the group's interpretation, require federally supported research in agriculture to benefit small farmers and laborers, not agribusiness."¹⁵ UC lost the case in 1986 but won on appeal in 1989. Nevertheless, the backlash against the University of California opened up a political space in the 1980s for key programs such as the UC Small Farm Center and the Sustainable Agriculture Research and Education Program (both located at UC Davis) and the UCSC Agroecology Program—Editor.

¹⁶ See the oral history with Amigo Bob Cantisano in this series for more history on the Ecological Farming Conference.

¹⁷ See the oral history with Amigo Bob Cantisano in this series for more on the political battle to establish UC SAREP.

¹⁸ See the oral history with Jim Cochran of Swanton Berry Farms in this series.

¹⁹ Stephen Gliessman, editor. *Agroecology: Researching the Ecological Basis for Sustainable Agriculture. Ecological Studies 78* (Springer-Verlag, 1990).

²⁰ Dale Coke of Coke Farm began growing strawberries organically in 1980, but Cochran was the first to distribute organic strawberries into a variety of larger retail and wholesale markets. See the oral history with Dale Coke in this series.

²¹ The Montreal Protocol on Substances That Deplete the Ozone Layer was an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. One of these substances was methyl bromide, which is heavily used in strawberry production. The treaty was opened for signature on September 16, 1987 and entered into force on January 1, 1989. However, conventional strawberry farmers have applied for exceptions and have continued using methyl bromide.

²² See the oral history with Sean Swezey in this series.

²³ Gliessman discusses the different levels of transition in the section of this transcript entitled "The Four Levels of Transition in Sustainable Agriculture."

²⁴ See "UC Santa Cruz Develops Powerful New Approach to Protect Strawberries From Pest," *UCSC Currents*, July 16, 2007, http://www.ucsc.edu/news_events/text.asp?pid=1440

²⁵ According to IFOAM's website: "The International Federation of Organic Agriculture Movements, abbreviated and best known as IFOAM, began life in a very historic place - Versailles, France on November 5th, 1972. It all started during an international congress on organic agriculture organized by the French farmer organization Nature et Progrès. The initiative came from the late Roland Chevriot, President of Nature et Progrès. There were 5 founding member organizations at the cradle of IFOAM: The Soil Association from Great Britain represented by Lady Eve Balfour, the Swedish Biodynamic Association with Kjell Arman, the Soil Association of South Africa in the person of Pauline Raphaely, Rodale Press from the United States of America whose representative was Jerome Goldstein and of course, Nature et Progrès with Roland Chevriot. The aims of the new organization were reflected in the chosen name: International Federation of Organic Agriculture Movements. The founders hoped that the federation would meet what they saw as a major need for the organic movement - the diffusion and exchange of information on the principles and practises of organic agriculture of all schools and across national and linguistic boundaries."

http://www.ifoam.org/about_ifoam/inside_ifoam/pdfs/Early_History_IFOAM.pdf

²⁶ 5th IFOAM International Scientific Conference "The Importance of Biological Agriculture in a World of Diminishing Resources," August 27-30, 1984.

²⁷ See the oral history with Patricia Allen in this series.

²⁸ The 6th IFOAM conference, entitled Global Perspectives on Agroecology and Sustainable Agricultural Systems took place in Santa Cruz. According to IFOAM's website: "A real opening up to the countries of the so-called third world can be dated back to the IFOAM scientific conference in Santa Cruz/California in 1986. Many participants, especially from Latin America, gave inspirations and the mood of the time was reflected with the decision to hold the next IFOAM conference for the first time ever in the southern hemisphere in Ouagadougou/Burkina Faso." http://www.ifoam.org/about_ifoam/inside_ifoam/pdfs/First_25_Years.pdf

²⁹ <http://www.nal.usda.gov/afsic/AFSIC-pubs/oralhist.htm>

- ³⁰ Nancy Abrams is a historian, lawyer, and philosopher of science who, with her husband Joel Primack, is the author of *The View from the Center of the Universe* (Riverhead Books, 2006).
- ³¹ See the oral history with Robbie Jaffe in this series.
- ³² Art Pearl is a UCSC (emeritus) professor of education.
- ³³ Bryan Farrell was a professor in the environmental studies department at UC Santa Cruz.
- ³⁴ See the oral history with Mark Lipson in this series for more about Molino Creek Farm.
- ³⁵ Bud and Lud McCrary are proprietors of Big Creek Lumber, a family business which began in 1946, and is known for sustainable logging practices. See <http://www.big-creek.com/>.
- ³⁶ Stephen Gliessman, editor. *Agroecology: Researching the Ecological Basis for Sustainable Agriculture. Ecological Studies 78* (Springer-Verlag, 1990).
- ³⁷ Eugene Odum and Howard Odum, *Fundamentals of Ecology*, (Philadelphia: W. B. Saunders Company), 1953.
- ³⁸ Raymond F. Dasmann was a faculty member in environmental studies at UC Santa Cruz who taught many courses, including ecology. Dasmann was the author of more than a dozen books, including *The Destruction of California* (1965), *Environmental Conservation* (fifth edition 1984), *Wildlife Biology* (second edition 1981), and *California's Changing Environment* (1981). A visionary environmentalist, Dasmann began working as a conservation biologist in the 1950s when the field was just emerging, identifying the major threats of population growth, pollution, habitat loss, and species eradication that would become the focus of international conservation efforts for decades to come. See the oral history book *Raymond F. Dasmann: A Life in Conservation Biology* published by the Regional History Project and available through the University of California press.
- ³⁹ R. Lowrance, B.R. Stinner and G.J. House, *Agricultural Ecosystems: Unifying Concepts* (New York: John Wiley and Sons, 1984).
- ⁴⁰ Stephen Gliessman, *Agroecology: Ecological Processes in Sustainable Agriculture* (Ann Arbor Press, 1998.)
- ⁴¹ Stephen Gliessman, ed. *Agroecosystem Sustainability: Developing Practical Strategies* (CRC Press, 2001).
- ⁴² Brian Walton passed away only a few weeks after this interview, at the age of fifty-five. Walton had been the coordinator of the Santa Cruz Predatory Bird Project for thirty-one years. In 1999, the peregrine falcon, nearly extinct two decades earlier, became one of the few endangered species to be "delisted"—removed from the endangered species list—by the U.S. Fish and Wildlife Service. In 2006, SCPBRG staff conducted a statewide census of peregrines in California and documented 179 active nest territories. In addition to its peregrine falcon work, the SCPBRG under Walton's leadership was involved in research in captive breeding and wildlife management of eagles, condors, and other rare or endangered raptors. The program is now located at UCSC's Long Marine Laboratory.
- ⁴³ See <http://www.agroecology.org/>
- ⁴⁴ M.A. Altieri, *Agroecology: the Scientific Basis of Alternative Agriculture*. (Boulder: Westview Press), 1987.
- ⁴⁵ "Agua Buena is a small town in the county of Coto Brus, Costa Rica, located on the border with Panama in the mountain region south of La Amistad National Park." See <http://communityagroecology.net/communities/cotobrus/> for more information.
- ⁴⁶ C. M. Bacon, V.E. Méndez, S.R. Gliessman, D. Goodman and J.A. Fox. *Confronting the Coffee Crisis: Fair Trade, Sustainable Livelihoods and Ecosystems in Mexico and Central America*. (MIT Press, 2008).
- ⁴⁷ See the oral history with Tim Galarneau in this series for more about these student movements.
- ⁴⁸ See Richard Merrill, editor. *Radical Agriculture* (New York: Harper and Row Publishers, 1976) and the oral history with Richard Merrill in this series.
- ⁴⁹ See the oral history with Scott Roseman in this series for more on New Leaf Market's programs.
- ⁵⁰ See <http://www.rocfund.org/>
- ⁵¹ (New Press, 2004).
- ⁵² See <http://www.vividpicture.net/>
- ⁵³ See the oral history with Roberta Jaffe in this series.
- ⁵⁴ See the oral history with Drew Goodman in this series.

⁵⁵ See the oral histories in this series with Gail Harlamoff, Amy Katzenstein-Escobar and Erika Perloff for more about Life Lab.

⁵⁶ In October 2007, California Governor Arnold Schwarzenegger signed the Ridley-Tree Condor Preservation Act, AB 821, which will remove lead ammunition by having hunters switch to a widely available, non-lead ammunition alternative when they hunt big game and coyote in condor country.

⁵⁷ In December 2007 Jaffe went back to twenty-five percent time with the New Teacher Center, and began a paid eighty-percent position as CAN's executive director.

⁵⁸ Peak oil refers to the peak in oil production, after which oil prices will begin to rise steeply, affecting the global economy in a variety of ways. A number of recent books have been published which address the implications of peak oil. See, for example, Richard Heinberg, *The Party's Over*, (New Society Publishers, 2003).