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E. Charles Prather: Good afternoon. Mrs. Elisabeth Beck, a longtime associate with the entomology activities of the—of Florida. Most of that career was with the Florida State Board of Health and its subsequent organized—organizations that I'll refer to as the Department of Health, but a very long time employee involved with the bugs of importance to the public's health. And miss Beck it's truly a pleasure and a compliment to have you willing to come and share your very fruitful and fun and exciting, from our point of view, history with the public health bugs of Florida. And we thank you for coming. How did you ever get interested in bugs?

Elisabeth Beck: Well, I started out interested in it when I was in school, I was interested in going into medicine.

CP: Yes.

EB: But I ran out of money like a lot of people.

CP: I understand.

EB: And when I left school, Dr. Boyd at the Malaria Rockefeller—Malaria Research Station in Tallahassee asked Dr. Davini to help him find a technician, so she got in touch with me and I went to work at the Malaria Research Station.

CP: At the, what is now is the campus of FSU (Florida State University).

EB: Right, it was FSCW [Florida State College for Women] then.

CP: FSCW; my favorite place, by the way, because that's where all the women were.

EB: Well, yes, everybody liked it at that time. Everybody male anyway. (EB laughs) But it was a very, very interesting place to work and Dr. Boyd was a tremendous person and I started out—well first of all I'd learned to identify the various malarial parasites.

CP: Yes

EB: And—and they had something going on now, that now a days would sound kind of—to put it mildly, primitive, but at that time they were using malaria to try to cut down on the syphilis impact on the brain of patients at Chattahoochee (Florida State Hospital). And we would—there was an insectary and we would infect mosquitoes—they would infect the mosquitoes with malaria from one of the patients there and bring them back over, and we would keep them until the malarial parasites matured. And then they would take them back and feed them on a patient who had syphilis that was affecting the brain. And the high fever would tend to kill off the malaria.

CP: And saw off the syphilis bug.

EB: I mean, excuse me, yes, the syphilis and I never did get to go over to the—to the—to Chattahoochee to see them do this and I'm sorry I didn't, but anyway my part in it was at first identifying the blood smears of malaria and later dissecting out the salivary glands and the stomachs of mosquitoes, looking to see how mature the parasites were.

CP: Oh, boy.

EB: And while I was working there, this was right at the beginning of World War II, and the government decided that they needed to train some people in malaria control or we were never going to win the war. And they would bring in various offices from all over the country, and all of the military units, and bring them to Jacksonville; and the people in Jacksonville would talk with them about controlling mosquitoes and give them the background information.

And then they would bring them over to Tallahassee; and we would show them malarial slides, and show them how to dissect, and how to read the slides, and Dr. Mulrennan, John Mulrennan, would come over with them, and he would teach them mosquito identification.

And I sat in on one of the classes where they were teaching mosquito identification; and then, after that, they would take the group on over to Tallahassee and—I mean over to Pensacola, to see them actually doing ditching and so forth, so they would know what to do when they got out in the field. It was interesting because a number of different groups of people came through.

And my husband Bill was out in the Pacific at the time, and he kept running into people who had recently seen me, and he hadn't seen me for a year (CP and EB laugh), and he wasn't too happy with that. But anyway, that was my work over there; and it was because I learned identification there that after I came back to Jacksonville, Dr. Mulrennan called me and asked me if I would be interested in coming to work at the State Board of Health for—for the Bureau of Mosquito Control.

CP: Yes.

EB: And that's how I got into that part of it.

CP: Can I ask you what year you came?

EB: Forty-four, I think. The first time I came to work here, the federal government, the U.S. Public Health Service, had a program called "Malaria Control in War Areas."

CP: Yes, yes.

EB: And this was a program, where they would go to the various military instillations, map out a radius of one mile from around the station; and then they would do anopheline mosquito control and—and also surveillance to try and be sure that none of the military bases got malaria. And I worked in that for a while, you know, helping them with the maps and doing the mosquitoes and stuff; and then I think it was about '41 or '43 that the—that the Bureau of Etymology was set up.

CP: Yes.

EB: And after this program was over, I just went into the lab there, doing mosquito identification with the bureau. And we were running light traps all over the state to determine what the populations were and what the different species were in the state. At one time, it was very neat; we had sixty five-species in sixty-five counties in Florida, but unfortunately, they were not distributed one to a county (CP laughs).

By now, there have been several new mosquitoes that have been added on to that; and in those first few years, we were of course interested in mosquitoes because of malaria. By that time, dengue and yellow fever has ceased to be a problem, but we did have malaria right up until 1948.

CP: Yes.

EB: Before 1948—about ’45 and ’46, the bureau was involved in a program to spray unscreened houses in the state. And they had some twenty-eight counties in central and west Florida that had high malaria. And they went in anywhere where there was an unscreened house, they would spray it with five percent DDT. And while DDT may have its drawbacks, it certainly did a phenomenal job with taking care of the malaria problem.

CP: It stopped malaria in Florida.

EB: Another thing it helped out in was there was a little program on typhus which I believe sanitary engineering which malaria was a part of—I mean the mosquito control was a part of at that time. They were working trying to get rid of endemic typhus.

And they would do rat proofing. It was the main thrust of it, but they also they went through and DDT’d the rat runs to try and cut down on the number of active parasites; because at that time, when they checked the blood from these rats, they found that eight out of ten of them were carrying murine typhus.

CP: Really?

EB: It was that high.

CP: Oh, man. Can you remember the geographic distribution? Was there a few counties that were outstanding?

EB: Most of the county, and I really don't remember the geographic distribution of the disease.

CP: That's okay.

EB: But most of the counties that had a problem were in central to west Florida, like Gainesville, like Alachua, Marion and then on up toward the western panhandle.

CP: Okay, not much in the south?

EB: Not much in South Florida.

CP: All right, all right.

EB: Although they did do an extensive rat control program in Tampa because they, I don't know if it was because of the typhus or not, but they did have such a problem with rats; you know, the port area.

CP: (laughs) Yes, yes, yes.

EB: And the mosquito control—the Florida Mosquito Control Association, which, at that time was called Florida Anti-Mosquito [Association], was formed in 1922 and about '25, the people in Indian River County formed the first district in the state.

CP: Ah, Mosquito Control District.

EB: Uh-huh.

CP: Yes, yes.

EB: At that time, Mosquito Control District was strictly a self-taxing district. And it was not until several laws later, all of which, incidentally, Dr. John Mulrennan managed to get through the legislature.

CP: Yes.

EB: It was not until about ’53 that the state started providing some matching funds for mosquito control.

CP: What was your involvement with these early mosquito control efforts? Still identifying mosquitoes?

EB: Most of—most of my work had been in identifying mosquitoes, yes, and when we had, well later when SLE [Saint Louis Encephalitis] came up, of course, I was involved to some extent in working with other bureaus to, you know, to try to see what we could do with that.

CP: I remember you separating the live mosquitoes on a frozen plate of those that are likely to have the Saint Louis [encephalitis virus] from those that weren’t likely. I remember you doing that.

EB: Right. Most of the districts—a lot of the districts, in particular those in South Florida, would ship in live mosquitoes packed in dry ice.

CP: Yes.

EB: And then we’d work on a cold table and separate out mostly *Niagara palpus* after they discovered that was a primary vector during the epidemic mainly in the Tampa Bay area. And then of course once we separated them out and froze them we gave them to the virology lab to check out. The mosquito districts also, most of them had ran sentinel chicken flocks and drew blood and had that checked to see whether or not it was—

CP: From the chickens?

EB: Whether incidentally it was circulating or not in that area.

CP: And they still do that I think. They still keep chickens there.

EB: I think there are a few of them still doing that, yes.

CP: I know in my home—in my home they still talk about the chicken flocks; and they still quote the data from their chicken flocks, which has already begun in Tallahassee for this year.

EB: Right.

CP: The media still follows that, “What’s your rate of positive on your chickens?” (CP and EB laugh)

EB: Yes, I remember well (both CP and EB laugh). One other program that ran somewhere and then I don’t remember the years, the U.S. Public Health Service was sponsoring a program throughout a good bit of the South to try to eliminate *Aedes aegypti*.

CP: Oh, yes.

EB: And while most of the fieldwork was done by public health people, we did a lot of the identification work in the laboratory. Needless to say, it was not successful. You don’t eliminate —

CP: Apparently not.

EB: —anything very well, although at the present time, the Asian Tiger Mosquito seems to be moving into the territory pretty much that *Aedes aegypti* has always occupied.

CP: Will they replace the *Aedes* because of lack of habitat?

EB: They don’t really replace, but they seem to be much more numerous; and they’re great deal more of a nuisance to people than the *Aedes* are because they bite.

CP: Yeah, they’ve gotten better. Yes, we can thank Jacksonville for that. They came in via the Jacksonville port, the *Aedes aegypti* did. Probably not the *Aedes aegypti*, the Tiger Mosquito. And we have them in Tallahassee now too, for your interest.

EB. Well, I think they’re pretty well spread around the Southeast now.

CP: I'm recalling a massive campaign in Tampa in the late '50s, early '60s called "Fight the Bite" that you were involved with. Do you recall any of that?

EB: I don't remember much about it unfortunately, or fortunately as the case may be. My involvement with these programs usually was a matter of staying in the lab and taking care of mosquito identification. At least, back in the early days.

CP: Yeah, you didn't get out of there. That was a—that was a massive public education campaign aimed at eradicating *Aedes aegypti*; and Dr. John Neil was the health officer, and his outfit helped educate—coined the phrase "fight the bite", and it was massive. The public health service got very involved, and it was a very large funded, large funded activity from the public health service point of view was experimental and they wanted to see what could happen. And let me tell you, very little happened.

EB: It's unfortunate but that's often the case.

CP: A three year campaign, yeah, and a year later, the *Aedes aegypti* counts were officially what they were before the campaign started.

EB: Unfortunately, any campaign that depends on a lot of individuals gettin' out and doing something is doomed to failure, usually. Sad but true.

CP: But I remember that one. I'm sure you were involved with it, but I don't ever recall you being in Tampa.

EB: No, I was not in that area—

CP: Tampa, because we weren't doing much with the mosquitoes, we was trying to kill em'. Or they were trying to kill them, I was just interested in the program because it was a research—a research activity from a public health service point of view. You know and they kept up with it, and kept up with the folks down there. Birk was the health educator's name, I just thought of that.

Miss Birk, yeah, a very dynamic, almost Mrs. Katherine Reed ilk, was Ms. Birk was in the sense of enthusiasm, but not size. (CP laughs) So, your career has been mosquitoes, as your lapel pin shows, but I also remember me and Dr. Mulrennan going to Volusia County outside of Deland,

once upon a time. Me and he did, and walked through the woods, collecting ticks. And we brought those ticks back to you to identify.

EB: Right, I really never got terribly good at ticks. We had Dole Taylor was the person that worked mainly with ticks, and in fact, did a key to the ticks of Florida.

CP: Yes, he did. Now, good. Keep talking, because there's a lot of firsts around John Mulrennan's attention to ticks. You know, the very notable from your entomology point of view was the discovery of the Rocky Mountain Spotted Fever in Volusia County of a case there that our labs diagnosed after the fact. And it was that Rocky Mountain Spotted Fever had never been seen in the Southeast at all, you know. And that was the basis for me and Dr. Mulrennan's going to Volusia. And it was Dr. Mulrennan himself and me went outside of Deland and got ticks.

EB: And did you drag claws through the woods?

CP: Yeah, dragged Kroger sacks—Kroger sacks through the woods and over the low-lying bushes and we, man, we got gallons of ticks. (CP laughs)

EB: I learned something incredible the other day, at least it surprised me greatly, at reading one of Archie Karns' books and he says that, "Spanish Moss does not ever have red bugs or ticks in it."

CP: Hanging in the trees.

EB: In the trees.

CP: I believe that. Hanging in the trees.

EB: If it falls on the ground, though, that's another matter.

CP: Watch it. Watch it. Don't sit on the moss on the ground. I learned that as a Boy Scout, our scout master said if you want moss under your bed get it off the tree, otherwise—. And I remember his taking black, scoutmaster—our scoutmaster taking a piece of black oilcloth I guess, I'm not sure what you call it, ladies covered their dining tables with it—

EB: That's oilcloth. It was then. It's plastic now.

CP: Yeah, okay, and the scoutmaster would take moss of the ground, and shake it over this plastic—over this black cloth, you know.

EB: And see all these little creatures.

CP: And then we'd get down a watch the little red dots run all over the place. That's when I was a boy scout too, and that's been a long time ago, Beth. But you weren't involved with that.

EB: No.

CP: With that sort of stuff, not very much.

EB: No I did get off a little bit when we were doing the typhus thing identifying—

CP: Fleas?

EB: Lice and fleas but it—they gave me a quick course in it, and it there were a lot of things that I'm sure enough different, there should have been something, else but anyway.

CP: Do you recall the "eradicate the rat" campaign in Jacksonville in about '72, '71, '73 that Governor Claude Kirk was so excited about? And he would come by here about once a quarter and hold a meeting in the auditorium of the State Board of Health, gather in the city health department people and others and want an exact count of the numbers of rats killed since last time he was here. Do you remember that?

EB: No, (EB laughs) I didn't get to sit in on any of those.

CP: It got down to, it was kind of a fun meeting because he was tough on, "we gotta' do something about the rats in Jacksonville." But I remember his making a big joke over combing the rats. Probably Dr. Mulrennan said, "The rats ain't the problem. Rats ain't the problem Governor. It's them fleas on the rats." So he wanted some combing, the Governor said, "Let's comb some rats and let's see."

Because they were doing, they were poisoning the runs too to get rid of the actual parasites. Didn't have a problem with typhus in Jacksonville but the rat problem, apparently the city folk, Governor [Claude] Kirk went and sat in the poor sections of town and wanted to know their problem was.

EB: And they said the rats.

CP: And the rats, the rats were a problem, so he mounted a rat eradication program in Jacksonville, Governor Kirk did. It was probably Mr. Mulrennan who convinced the Governor that it wasn't the rats at all, oh, it's the fleas that the rats, well—he wanted to get some counts on fleas. "Let's see if our flea eradication program is doing any good, so I want counts of fleas next time I come."

EB: Well, I remember there was a man by the name of Braswell who used to comb the rats and bring us, it was not my favorite job I'll tell you, he'd bring us little jars full of alcohol or what, formaldehyde, or whatever, with all this rat hair in it and all these little fleas and ticks, and everything else, lice, all kinds of lice, and you'd have to carefully tease all that stuff out and try to identify.

CP: And count 'em.

EB: And count it. Especially count the fleas for Dr. Kirk.

CP: Yeah.

EB: For Governor Kirk.

CP: I'm sure you were involved with that, then. That didn't go on very long, but it was kinda' fun, kinda' fun in a sense because—because everyone kind of stood at attention when Kirk came in. And he was serious about that rat eradication program. And he held firing authority over most of the folks that had responsibility. And he was a very dynamic person, all right.

EB: I'll tell you, mosquito control has changed. What they are doing to control mosquitoes has changed through the years when I've been here because—

CP: Tell me about that.

EB: When I first started, almost all the effort went toward ditching or filling.

CP: Drain and fill. Fill and drain.

EB: Right. In fact, the early programs in Florida were mostly done by the federal government, and they were mainly ditching projects; but down the east coast, their big problem was salt marsh mosquitoes, and they found out that if they could keep the—the salt marsh mosquitoes come in a lay their eggs on the soil, and then when they flood they hatch. And they found that if they could keep the areas where they normally lay their eggs flooded during that season, they wouldn't have as much of a problem, so most of the east coast of Florida has impoundments up and down it.

CP: That's control of keeping the water there; on the west coast, it's getting rid of the water.

EB: Right, well, they keep the water there, but they have culverts and outlets where they can let it go off again when they can. But, of course, that met with eventually with considerable opposition from environmental groups, understandably. And they set up ways to mitigate it. I mean that we could cover the water if we do so and so, you know. But anyway that—but because and actually and changes—environmental changes, became very difficult, there began to be more and more emphasis on the use of insecticides.

CP: Yes. Now they're kind of taboo now.

EB: Well, yes, that's another problem. Everybody urged that we tried to find biological controls. And so then a number of biological controls of larvae were developed. Only trouble is they just quite won't do the job; and also they have found that some of them create ecological problems—

CP: Problems of their own.

EB: With other insects too. And so, one big problem they are having right now is that there are only a very few companies making mosquito control insecticides.

CP: Oh, really? I didn't know that.

EB: And they will not put the money into research to find new products because the market is not big enough to justify it. So there are fewer and fewer new possibilities coming up. The only really helpful thing that's been developed in recent years is that they've been able to use computers for things like plotting for larval control and that sort of thing.

CP: Get more exact on where they are?

EB: Right. And they've used a good bit of funguses—various funguses—fungi, and bacteria and so forth to try and treat larvae and kill them off before they become adults.

CP: Does that look promising?

EB: It looks promising, except that sometimes the things that kill off mosquitoes larvae kill off other things too, then you have a problem there with somebody. (EB and CP laugh) So, it's a constant battle; there is no question about it. People don't want the mosquitoes there, but they don't want the methods that we have to get rid of them, and they haven't come up with anything better.

CP: They need to make a choice. I remember Dr. Mulrennan telling the legislature that we had to make a choice. We either have tourists or—and no mosquitoes, and can't have both. We have got to control mosquitoes to have tourists or we don't control mosquitoes, we won't have tourists. Yeah, so it's a choice. Use pesticides or don't have tourists.

EB: That was always his best argument; I mean he had this wonderful graph that showed relationship of—a very neat relationship between the reduction in mosquitoes and the increase in tourism dollars. You can sell that to the legislature.

CP: Yep, and he did for many years. Yes, he did. He was so good. I'm sure it was fun to work with him.

EB: It was; and the most wonderful thing about him was he'd give you a job to do, and leave you alone, and assume you had enough sense to do it.

CP: That is so desirable, isn't it?

EB: It is. It's wonderful. He was also very, very helpful to me personally. I did not finish my basic college when I was over there, because I ran out of money, and went Bill went back to college he let me take my work to Tallahassee. I mean, they sent me identification things over there, mosquitoes to identify and they made me a place in the county health unit to work, and he told me to go to class when I needed to, and do the mosquitoes when I could.

CP: Really?

EB: And, of course, it wasn't officially approved.

CP: Oh, well, you got your degree and you identified the mosquitoes?

EB: I got my degree. Right. It all got done; it just wasn't done by the book.

CP: Did you get your degree in entomology?

EB: No, I got my degree in biology.

CP: It was in biology, okay.

EB: FSCW did not offer up a degree in entomology.

CP: Well, that's not a job for girls.

EB: Well, no, not supposedly. One sideline I did get off on was working with the taxonomy mainly of sandflies.

CP: Oh, yes, we had a major sand fly research place over in west Florida, didn't we?

EB: Yes, we did. It was set up for that purpose originally; it's just a general lab now.

CP: Speak to that. We'd be very interested in that story.

EB: Well, through Dr. Mulrennan's efforts, there were three different labs set up in the state. One of them was the west Florida lab, which was going to work, to some extent at any rate, on dog flies, and it was going to work on the insecticide testing side of things in order to get the insecticides away from the Vero Beach lab, which had been set up earlier.

Because the Vero Beach lab was set up for pure research, and they really didn't want insecticides around their animals they were working with.

CP: (CP laughs) I can understand that.

EB: The third lab that we set was a lab down in Winter Haven, which was to study blind mosquitoes, which were an enormous problem at that time. Blind mosquitoes, of course, are midges and not mosquitoes at all, and they don't bite but they would just come off of the lakes—

CP: Get in your eyes.

EB: —in such enormous numbers, and in your barbeque, (EB laughs) which is even worse.

CP: And in your barbeque yes, I've experienced those.

EB: And they would gather around houses that had been painted, and just absolutely ruin them. So, they did work for a number of years down there on trying to control blind mosquitoes, and, you know, I don't know exactly why they're not having the same problem with them now, because we never did solve the problem. (CP and EB Laugh) All things take care of themselves in time, I guess.

CP: Yeah. That would be a—that's a fun question: If the populations are down, why?

EB: Well, it may have something to do with the change in lake bottoms down there; I don't really know. The blind mosquitoes bred primarily in the mucky areas of the lakes. I don't know if they changed to any extent or not. Maybe the lakes are so polluted the midges can't live. I don't know.

CP: That's fascinating. I haven't traveled in those parts much, but back when I did travel in those parts, those blind mosquitoes, during the season when they are up, they were terrible.

EB: There was a little Holiday Inn at Deland, Florida that was right near the water and they—their air conditioners would get clogged with them.

CP: Oh, man.

EB: I mean, it was that bad. And I don't know how many meetings I've been to down at Deland about, "what can we do about the sandflies?" And everybody would get up and tell them the same thing, "That there's not really much you can do."

CP: Yeah, sandflies and blind mosquitoes, they the same thing?

EB: No.

CP: Oh, oh, oh, okay, okay.

EB: Sandflies are biting midges, little tiny no-see-ums.

CP: No-see-ums. And a special lab was set up for those?

EB: No, no, the work that's been done on them in Florida has been done at Vero Beach, and I worked some on the taxonomy of the groups, you know.

CP: Tell us about that. Taxonomy. What's taxonomy?

EB: Well, taxonomy is separating different species, one from the other. Taxonomy is the naming of the species. I got interested in them because so many of them turned up in light traps. And they all didn't look alike, so I started trying to identify them. And eventually I sent some up to Dr. Willis Worthit at the US National Museum, and he verified my identifications, and he really was wonderful. He worked with me and sent me material and reprints and everything.

And I did eventually publish on culicoides[1] in Florida, but it's not a—a complete list now by any means. I mean a number of species now have been found since.

CP: Oh, really? How many do we have in Florida?

EB: I don't really know how many we have at this time. There must have been 15 or—somewhere between 15 and 20 when I was working with them.

CP: It's my impression they are predominately a pest of the coastline?

EB: Yes and no. There is at least species that's been quite a serious problem around the springs in Florida, so it's a fresh water breeder. There are fresh water ones; they're not all—

CP: Is any disease, human disease process associated with them?

EB: No, no human disease there; diseases of sheep that have been carried by them, but not for people.

CP: No, they're just a nuisance to people.

EB: They don't—they don't need to, they hurt. And there are people who react very badly to sand fly bites.

CP: Because of allergies, probably.

EB: Probably.

CP: So, you did some publishing on the taxonomy of the sandflies; whatever became of that? Did we ever enter into any control effort for sandflies?

1Culicoides is a genus of biting midges in the family Ceratopogonidae.

EB: Some of the mosquito districts have tried controlling, but actually, when people call up and say, “What can we do about the sandflies?” They say, “Go indoors; and if you got windows screens, spray the window screens because they can come through a lot of them.”

CP: Window screens don’t keep the sandflies out.

EB: No; but if you spray the screens, it helps.

CP: Yeah. They have ran us off of the beach, camping out on the beach. A number of times, particularly on Cape San Blas.

EB: Or even run me out of the front lawn, just watering the grass.

CP: Man, those things. So, we don’t have a way. You mentioned the dog fly, and a special lab was set up for the dog fly one?

EB: Well, the west Florida lab was set up both to do dog fly control and to test insecticides for mosquito control.

CP: Tell us what a dog fly is.

EB: Well, the dog flies are a biting flies, and they are particularly prevalent along the beaches out in the west, out on the Panhandle. And a number of people that own hotels and motels along the beaches got very upset about it, and they would call their mosquito control directors.

And they eventually set up a program out there where there was a plane that was stationed at the laboratory there in Panama City; and it would go out and spray at the proper time to try to—particularly along the beaches areas—so they could keep the Alabama people coming down the coast down there.

CP: Did it do any good?

EB: Yes, it seems to work pretty well.

CP: Can you bring us up to date? I want to recall that they decided that the washed up seaweed was the breeding site.

EB: Well, now I can't give you a date. That was something that I guess Dr. Rogers and his group over there did determine.

CP: Yeah, me and you have been out of the business too long.

EB: You're right, well, I don't know about that. We have been out too long to remember that. (EB and CP Laugh)

CP: Speaking of Dr. Rogers, he was director of the west Florida lab?

EB: Yes, he was. He originally went down to Vero Beach, and was doing the insecticide testing material down there, so when they set this lab up in west Florida, they sent him out as director at that lab.

CP: As an aside, is he still living?

EB: Yes.

CP: And he's doing okay?

EB: Far as I know?

CP: And he lives in Panama City?

EB: Right. He was a professor down at the University of Florida, and there was an entomological meeting here in Jacksonville, and I was standing there with Dr. Mulrennan when he asked Dr. Rogers if he's be interested in leaving the university and coming with the State Board of Health.

CP: Oh really? And he did?

EB: And he did.

CP: And he did. And I recall he was the acting director after Dr. Mulrennan quit.

EB: Right.

CP: Yeah, Dr. Rogers was for a short period of time, I remember.

EB: Just long enough to let John junior get out of the Navy.

CP: That's exactly what it was, exactly what it was. Those are fun. The dog fly—did you ever get directly involved with the dog fly?

EB: No, no.

CP: Okay.

EB: I'm happy to say I didn't, because the only person I know who did went up in the plane, and wasn't supposed to be on it and they got rid of the head of the dog fly program at that point, because he wasn't supposed to take anybody unauthorized up in the plane. So, see, I did well not to get involved in that.

CP: Now you were smart beyond your years.

EB: No, I was lucky beyond.

CP: Tell us something about Dr. Boyd. Dr. Boyd is famous in medical circles as the publisher and author of the first comprehensive book on parasitology, medical parasitology.

EB: Well, I can't really tell you a whole lot about Dr. Boyd. When I went to work there, he was never anything but kind to me, but I was scared to death of him. I was only about 19 at the time, and he just seemed so remote somehow, but he wasn't at all. I mean he really was very, very kind.

CP: Obviously, a warm person.

EB: Very warm, yes. He had a tremendous number of visitors that came to the lab. I met some incredible people that I didn't even know who they were at the time, you know, who I heard about later who they were. I don't know. I can't remember their names now, but people who were high in the army and that sort of thing were coming down, I assume to discuss this training program and what not. I don't know, somebody by the name of Hardenberg comes to mind?

CP: That doesn't ring a bell.

EB: Anyway.

CP: You were kind of privileged to rub shoulders with a lot of those folks.

EB: I was very, very fortunate in everything that ever happened to me has been very, very happy and fortunate.

CP: Yours and Dr. Boyd's work with artificially induced fever using malaria parasites among tertiary syphilis patients—

EB: I wouldn't say mine and his. That really was his.

CP: You had a lot to do with it. That's landmark. That's landmark research growing out of that, out of yours and Dr. Boyd's work at Florida State Hospital, was the fever ships that the U.S. Public Health Service Commissioned; and later after you came back to Jacksonville, there was a fever ship parked at the Alsop bridge, docked at the Alsop bridge here for about a year.

And all the tertiary syphilis cases from all over North Florida were brought into Jacksonville to have artificially induced fever on them. Fever boxes, they were put in the boxes and their body temperature was brought to 106 and held there for eight hours. That was a direct outgrowth of yours and Dr. Boyd's research at Florida State Hospital, and it was effective in about a third of the cases just for your—your knowledge.

Not nearly as effective as penicillin; this was pre-penicillin, but it was much more effective than the mercury that was the treatment of choice at that time. With the mercury, we killed a lot of

them. You know, the fever wouldn't kill very many, and we cured about a third of them with the fever.

So, I don't want you to treat lightly your work with Dr. Boyd and malaria, and brain syphilis in Florida State Hospital. That—that—that was landmark. It's very significant research in our efforts to do something about syphilis—in the world's efforts to do something about syphilis. And you were part of that. That's the point I'm wanting to make. It had far reaching consequences beyond your just dissecting the bellies of mosquitoes.

EB: Right, you should see what people say when I tell them I dissected little salivary glands out of mosquitoes and they look like, "You got to be kidding?" (CP and EB laugh) I did have one experience over there that really made an impression on me during the early part of the war.

Dr. Boyd came in one day and he had one of these little old fashioned ice cream cartons, the round ones, about a pint size, and he opened it up and there was this white powder in there and he said, "This is DDT." He said, "This is going to win the war for us."

CP: Oh really, really?

EB: Sure enough, I think it had a great deal to do with it.

CP: I think it had a great impact on the war effort.

EB: Bill tells stories of mixing DDT by hand in the kerosene.

CP: I've personally have seen that. I was privileged to work with the DDT spraying stuff one summer when I was in high school in my little county of Hamilton. I was hired on by somebody and traveled. I didn't do any of the spraying, but I was partial. And those guys would dump the proportion in, and if their stick wasn't readily available, they'd just stir it up, pour it into their spray cans, and here they went.

EB: I was kind of amused. I was looking at one of the old health notes the other day, and they said that all this time they were spraying houses with DDT, and they got to where they went up to 35% DDT. They never heard of anybody being sick from it. [The health notes] said one or two of the people that did the spraying got sick, but they thought that was the xylene and not the DDT.

CP: That's interesting also. That would be a very fascinating study, to re-evaluate some of those sprayers of those days, if there is any of them living.

EB: I don't know many of them are going to be around, I wonder?

CP: I wonder, I wonder.

EB: Time's passing.

CP: Yeah, but that would be a useful study it seems to me. Thinking up.

EB: What somebody really needs to do is look at pest control operators.

CP: They still are kind of haphazardous with their control?

EB: I had to call the company one time and tell them that I didn't that man spraying in my front yard if he wasn't going to wear the mask and gloves and stuff. They just get where they don't really care and so many of them, seems to me, die of cancer, you know?

CP: That sounds like a very appropriate research project, and that pulls me back to the studies in Miami by Dr. Davies on pesticide poisoning among field workers. Do you remember that? I doubt that you were directly involved with that.

EB: No, I wasn't involved, but I remember that they did do that.

CP: The EPA, most of the EPA guidelines grew out of those studies there. Dr. Mulrennan was very involved and the Bureau of Entomology was very much involved with those studies in South Dade on pesticides and the long-term consequences of those. That's something else that would be useful to be followed up from students who might be listening.

Follow up those workers. Follow up some of those field workers on whom the records are still available at the University of Miami, that School of Medicine there. All those preliminary data there by Dr. John Davies are still there. That would be an interesting epidemiologic study, to follow up on those for long-term pesticide impact. You are a world of research ideas, Beth.

EB: You're welcome to 'em. I'm past the point where I want to do them.

CP: But you're still fascinated by such things, and so am I. Let's go back to your early days, and your mosquitoes, I don't believe, because of my personal experience, that you limited your attention that much to mosquitoes. What else did you do with the entomology people?

EB: In the early days, I really didn't do much except identification of one kind or another. Eventually, I got to the point where I was head of the identification lab and I did a lot, not a lot, but a fair amount of teaching, because we did a booklet on mosquito control for the people in Florida and I actually I put it together but a lot of people contributed to it. And we had training, things for them, the mosquito control personnel, particularly down at the Vero Beach lab.

They would come from all over the state and we would—there was a man out at the identification lab at the Naval Air Station here, Charlie Hammond, who used to work with us, and we would get up collections of mosquitoes, and pin them and have the people identify them down there and go into other aspects of mosquito control with them.

And my only other work with the bureau, oddly enough, is one day out of the clear blue sky; Dr. Rogers walked in my room and dropped the budget on my desk, and said, "You're the budget person for this organization from here on out."

CP: (CP laughs) That was when he was director, interim director.

EB: If it hadn't been for Embry Walker, I would never made it, because Embry was right across the hall with the laboratory budget, and I went to him with all my problems, which I had plenty of having never done anything like that.

CP: That was a good learning experience for you.

EB: Oh yes, it was a very good learning experience. We still had the Vero Beach lab at that time, so we had all the research grants, you know, and that sort of thing to keep up with.

CP: Came through this office?

EB: (EB murmurs in agreement)

CP: He did? Talk about the Vero Beach research lab. That was an internationally famous place at one time, and it's no longer part of the health (inaudible).

EB: No, it isn't. It's actually part of the University of Florida right now, and but still as an entomological research center.

CP: Yes, still focused there, that's great.

EB: The original director, Dr. Maury Provo, was quite a tremendous person, and the lab was a very largely his idea, I mean the way it developed was his idea. And Dr. Mulrennan worked with him to get the money to get it set up and so forth. And he really had quite a tremendous organization there. Unfortunately, after he died, you know, they had other directors, all of them who were good but never quite the same.

CP: Never had the same patience.

EB: No. And they got to where—I probably shouldn't say this—but they got to where they had a number of prima donnas down there who weren't satisfied with any director they really didn't want, or director at all.

CP: They didn't want their research directed.

EB: Right, they just wanted to do their little thing and have everybody ignore them.

CP: I think that's fair. The Rockefeller Institute of Medical Research, to which we owe so much bacteriologic/epidemiologic knowledge of infectious disease, suffered the same demise. That it got too many prima donnas who came in and wanted to do their own agenda, their own research, and they lost the central focus of what the original mission was. And because of that, that institution died, and the world is worse off.

EB: Right, well, I guess, in a sense, they were fortunate down there, because the University of Florida took them on. Yes, the original focus for that laboratory was supposed to be to work out, you know, what you can do to do mosquito control and still not hurt the natural resources of the state. I mean, they didn't word it that way, but that was the gist of it.

And I don’t know the people that gradually—well, right now, they’re more concerned about whether they are going to make full professor this year or not. You know, that sort of thing.

CP: Too bad.

EB: I don’t know what type of research they are turning out; I’m probably not being fair because I don’t see it anymore. Any way, it’s different.

CP: I don’t either. Well, that’s started as a public health effort; so did the dog fly laboratory; so did thrusting research on blind mosquitoes. What’s the proper name of the blind mosquito?

EB: *Chironomidae*.

CP: *Chironomidae*?

EB: C-H-I-R—

CP: Something like that.

EB: *Chironomidae*, anyway.

CP: Okay, and it belonged to what general family? They aren’t related to mosquitoes at all, are they?

EB: Only in the sense they’re both dipteral. They’re different families.

CP: Dipteral means two sets of wings.

EB: Right.

CP: See how knowledgeable I am? Two sets of wings. I know what dipteral means.

EB: I'm so impressed. (CP and EB laugh)

CP: And that started as a public health effort; the sand fly, the blind mosquito, the dog fly, and the mosquito, that I think most of us can understand, as primarily a public health issue.

EB: Well to be on this, an example now if you are speaking of sandflies, the only person that worked to any extant with sandflies in Vero Beach was primarily concerned with how they mated and laid eggs. Period. So, if they are related to any possible way of controlling them or not, you know.

CP: But he worked out how they laid eggs and how they mated?

EB: Right.

CP: That sounds like a very sexy subject.

EB: Oh, yes.

CP: (CP laughs) Yours has been—You've been in a position to see so much history being made and you haven't talked about really the St. Louis epidemic of the Tampa Bay area. You were right in the middle of that. You, personally; and you, the Bureau of Entomology.

EB: Well, you know all these things would be wonderful if you could go back and do them after you get older and wiser, supposedly.

CP: Oh, isn't it the truth?

EB: Because I missed so much of what was going on, you know?

CP: You were there.You were there. You was watching it.

EB: I was there, but I wasn't as cognizant of what was going on as I should have been.

CP: Yeah, I remember a number of the big pow-wows on St. Louis encephalitis in the Tampa area in which you were present.

EB: Right. Down in the virology lab, which is another thing that I think that Dr. Mulrennan helped get set up down there.

CP: He helped get it funded. Yes, he did. And Taylor was the entomologist that was attached to there. Yeah, he didn't do any ticks, as far as I remember, but he was the supervising entomologist. A super guy; he's now dead, is he not?

EB: I don't believe so; I think he's still around.

CP: He still lives around there?

EB: He was, the last I knew.

CP: Okay, I need to make a mental note of that. I'm thinking we might get him to talk to us about encephalitis days and tick days too.

EB: He probably could.

CP: So you're not being—you're not waving your flag as much as I think it's worthy to be waived because you have been witness to so much of importance to the public's health in Florida. Those insects, as Mulrennan says, if we didn't do something about the insects, we wouldn't have a Florida.

EB: That's true.

CP: Even the early conquistadors talked about the hordes of mosquitoes and how impenetrable they were. Alvarez, the first guy that traversed Florida from Tampa up the peninsula into what is now St. Mark's where he departed, his scribe, I'm talking 1550s[2], his scribe kept up with that

2The expedition of Álvar Núñez Cabeza de Vaca lasted from April 1528 to 1537. The aforementioned report mentioned above was not written, nor organized by a scribe, yet written from memory by Cabeza de Vaca after he returned to Spain. *La Relacion* (The Report) was published in 1542.

travel, talked about the hordes of mosquitoes between Tampa—they were coming to the Tallahassee area, because Indians around Tampa told them that was where all the gold was. So, they were coming up to get theirs.

EB: It's over yonder.

CP: But being interested in mosquitoes and reading the English translation of that diary, the frequency that he talks about these pesky mosquitoes that would cause the horses to panic. And beside themselves, they just had no way to do them. But he comments at one point that they thought the mosquitoes were bad, but when they got to the Tallahassee Indians that were called the Appalachia, not the Appalachia, the Apalachee.

The Apalachee Indians that were kind of headquartered around Tallahassee, he commented that that was worse than the mosquitoes, that was just like walking into a nest of hornets. To walk into the Apalachee Indians, but its—so our problem with mosquitoes is as old as recorded history we have of Florida. Mulrennan was so right. If we didn't do anything about mosquitoes, we wouldn't have any people here.

EB: He was right. You know, I remember reading about instances in which cattle had actually been suffocated by mosquitoes, and I thought, Surely that's an exaggeration, until we had a flat tire one day down on the, not on the A1A, but what is—the Turnpike, and by the time we got out of the car—our whole window shield, you couldn't see out of it for the big serape of mosquitoes.

CP: Really? Do they bite?

EB: Yes, they bite.

CP: And so, you got bit on while changing a tire.

EB: Yes we did, we did.

CP: Are they related to any disease?

EB: No, they're not, strangely enough.

CP: Okay, they're just a big—

EB: They got a good opportunity, but they haven't taken advantage of.

CP: Maybe none of the viruses liked them?

EB: Maybe that's it.

CP: Yours is a fascinating story; that you had the opportunity to rub shoulders with some very important soldiers of the public's health locally, nationally, and internationally, through your war effort too. And the work done here; ditch and fill, mosquito control and water, malaria control and its water, is my impression had its origin here. And that Dr. Mulrennan was kind of the big shots in charge of getting that off the ground and training for it.

I get that from—oh, shoot, I have a name block—but the fellow who was in charge of mosquito control/malaria control—put mosquito control in war areas—sanitary engineer who became the first director and organizer of the CDC. Mark Hollis, Dr. Mark Hollis, who I was privileged to know. But he knew Mulrennan; Mark Hollis is a sanitary engineer.

He relates coming—coming to Florida, he was responsible for the public health service and the war effort for the mosquito control and war—in war areas. And it's fun to hear him talk about their base research efforts on Amelia Island—

EB: Uh-huh.

CP: Amelia Island, I think. They set up a research lab, and brought in folks from all over the world, and helped work out techniques. But Mr. Mulrennan, Mr. Mulrennan, who was not a Ph.D., no; who was not one you'd pick out of a line-up to be a knowledgeable person; Mark Hollis remarks that Mr. Mulrennan, at that time, was kind of kingpin of the know-how, of the know how to get all of that done.

And I'm just impressed with you; that you had the opportunity to rub shoulders with those folks, and you're kind of a—I don't know anybody else who could recount that early history with Dr. Boyd, and the early history of America's attention to mosquito control in war torn areas.

EB: Well, there's one other person who just might, and that's Jack Rogers; because, strangely enough, when I was working for Dr. Boyd in Tallahassee, Jack was one of the people that was out in the field, collecting mosquito larvae and stuff, and he'd come by once in a while.

CP: Oh, really?

EB: I don't know whether he was working, I don't think was working for the lab, I think he was probably working for something in Tallahassee, you know, but we would see him occasionally there and he would bring larvae in.

CP: And you encouraged me to find him. You encouraged me to find him.

EB: I can give you—I will call you and give you an address. I don't think I have a phone number.

CP: Better than that, I'll write you a little note after all of this is over, and I'll send you a self-addressed postcard, and you just write Jack's address on the back of that. I would appreciate that. And I'm going to tell him you sent me. I will tell you that he was my minor professor at the University of Florida. And I know Jack Rogers very, very well.

But I've lost contact with him, and I just love him to death. It was he who made me give enemas to blowflies in order not to contaminate my specimens with the external flora of the blowfly. And I was looking for anthrax in the intestinal tract of blowflies as a—as a—as a minor thesis.

EB: The things we do; it's amazing, ain't it?

CP: Jack Rogers caused me to do that, and I had to learn how to give blowflies an enema. Jack didn't know how to do that. (CP laughs)

EB: I shouldn't think it was a technique everybody had.

CP: I traveled all over Florida collecting blowflies, you know. And I had to keep up with them geographically.

EB: You didn't collect enough of them. They are still around.

CP: Oh, boy, no I didn't, but I collected them. Entomology fascinates me a whole bunch, and a lot of that because of Dr. Rogers. And I thank you for bringing his name up. Yes, I do. Let me see, what have we left out?

EB: Well, I don't really know.

CP: Let me ask you a question. There will be students watching you. Students who are interested in entomology. Students who are interested in medical entomology will choose you to listen to. What advice do you have for them, for a career in medical entomology?

EB: Well, I don't feel like I'm in a position to offer advice. The first place, if it interests you tremendously, you're not going to need any advice; and if it doesn't interest you, you're not going to be any good at it.

CP: Well, first, don't go to FSU, because they don't give a degree in entomology.

EB: Well, now, since it's FSU now, they may give a degree in entomology, I don't know.

CP: Well, being from—

EB: But I don't think they do, though, because I don't think it's an agriculture college there at all, and that's where entomology is at Gainesville, strangely enough. It always struck me as strange, anyway.

CP: All right, they don't need any advice, but I noticed that you kind of got into yours accidentally.

EB: Well, I did get into mine accidentally.

CP: You needed a job.

EB: I needed a job, and that was fine, and I found it very, very interesting. I found working on sandflies on my own, which I did, you know, when I wasn't busy with mosquitoes, helped me get

more interested in it. Reading, of course, does. Oddly enough, the work I did on Chironomids, I didn't do because it interested me particularly; I did it because Bill was working on the larvae, and he needed somebody to do the adults.

CP: Now what are the Chironomids?

EB: They are the blind mosquitoes.

CP: Oh, thank you.

EB: Bill used the larvae along with a lot of other aquatic invertebrates to work out his system for determining stream pollution quality.

CP: And for our viewers, Bill is Ms. Beck's husband.

EB: Who is a biologist who was with the Bureau of Sanitary Engineering.

CP: He was an aquatic biologist, and he has a lot of famous firsts for his own, too.

EB: Of course, he was majoring in herpetology. That just shows you how you can end up where you aren't heading, a lot of times.

CP: But his was an outstanding career, too.

EB: Yes, and because he was using these larvae to indicate organisms, he needed to know what they were, and the only way you could find that out what they were was to wear them out and have somebody identify the adults. So, I had to learn to identify the adults.

CP: That's okay, and you did that officially because you were both part of the same agency. You didn't have to moonlight to do that.

EB: Well, no, we did a lot of moonlighting at home. Literal moonlighting.

CP: I’m sure you did.

EB: And so, I just really don’t know what to tell students except that whatever turns you on, do it.

CP: Whatever turns you on go after it. Go get it.

EB: And there’s an incredible number of people out there willing to help you.

CP: Obviously. Just look for them. They’re there.

EB: You don’t even have to look for them. If you work at it, and you are really interested in it, they’ll find you.

CP: That’s good testimony, Beth. And you can witness to that. And I can too. But this is not my time on the tape, but I will agree with what you are saying. They will find you. Well, let me tell you, on behalf of the University of South Florida library systems, and the College of Public Health, and myself, and Jane, we just thank you sincerely for coming by and sharing with us your fascinating career.

EB: Thank you.

CP: And I have just so much enjoyed hearing your story, and I knew a lot about your professional career, but I haven’t heard it so well organized like you’ve done it today.

EB: Come to think of it, I don’t know if it’s been that well organized.

CP: Yeah, it has. Yeah it has been fun and we thank you for coming.

EB: You’re more than welcome.

CP: And I’m Skeeter Prather.

End of Interview