James H. Oliver, Jr.: Ticks, Lyme Disease, and a Golden Gloves Champion

MARLIN E. RICE

James H. Oliver, Jr. is Fuller E. Calloway Professor of Biology Emeritus at Georgia Southern University and a Fellow of the American Association for the Advancement of Science. Oliver is widely recognized as an international expert in medical entomology and acarology, especially the biology and cytogenetics of pathogen-transmitting ticks and parasitic mites.

Oliver was born 10 March 1931 in Augusta, Georgia, but his boyhood was spent near Waynesboro, where his father farmed 2,000 acres. Oliver earned a B.S. (Biology, 1952) from Georgia Southern College (now Georgia Southern University), and an M.S. (Zoology, 1954) from Florida State University. He allowed himself to be drafted by the U.S. Army during the Korean War. He was assigned to the Army Chemical Corp in Ft. Dietrich, Maryland, at a top-secret biological warfare facility. There he was fortunate to work on a complex group of animals, which inspired his lifelong interest and determined the direction of his academic career. Using the G.I. Bill to further fund his education, Oliver earned a Ph.D. (Entomology, 1962) studying mites and parthenogenesis from University of Kansas. Upon graduation,

James Oliver at 10 years old, 1941.

he accepted an assistant professor position at University of California–Berkeley, but also was offered a National Science Foundation Postdoctoral Fellowship at Melbourne University in Australia. He convinced the department chair, Robert Usinger, to let him take a year's sabbatical leave to Australia before beginning his appointment at UC–Berkeley.

Oliver supervised the research of 30 master's students, nine Ph.D. students, and 30 postdoctoral students from 11 countries. He published 12 book chapters and more than 250 refereed papers, and has been awarded more than $12 million in research grants and contracts. During his career, he was a popular speaker and gave lectures in 24 states, 19 countries, and at numerous universities including Cornell, Harvard, Texas A&M, and Yale.

Oliver was instrumental in getting the U.S. National Tick Collection transferred from the Smithsonian Institution to Georgia Southern University. The collection has over one million specimens, 300 type specimens, and nearly all of the world's 850 recognized species. But news of the collection moving to Statesboro was not without controversy, as the locals complained that Georgia had enough ticks and didn't need any more brought into the state. He leveraged the National Tick Collection as a resource to conduct extensive research on Lyme disease, *Borrelia burgdorferi*, and the ticks that vectored the debilitating pathogen. Oliver and his colleagues found 300 southern

genetic strains of *Borrelia*; 57 of them nearly identical to the northern pathogen and are classified as *Borrelia burgdorferi* sensu stricto. Additionally, they discovered two new species of Lyme disease bacteria in the South: *Borrelia americana* and *Borrelia carolinensis*. If these two new species are found to cause illness in humans, then the discovery will help in understanding the debilitating Lyme disease in the South. Internationally recognized for his research contributions, Oliver has received numerous honors including the Honorary Gold Medal of Achievement, Warsaw Agricultural University (Poland); J. G. Mendel Medal, Czechoslovakia Academy of Sciences; Medal of Honor, Entomological Foundation; and Honorary Doctoral Degree (Doktor Honoris Causa), University of South Bohemia, Czech Republic.

The Entomological Society of America presented the Founders' Memorial Award to Oliver for honoring the late Robert L. Usinger, and he was elected an Honorary Member and Fellow in 1985 and 1995, respectively. Oliver served as president of several societies including the Southeastern Society of Parasitologists, Acarological Society of America, and in 1990, the Entomological Society of America. In honor of his lifetime achievements and dedication to science, Georgia Southern University created the James H. Oliver, Jr. Institute of Arthropodology and Parasitology, where he served as director for 19 years.

This interview occurred 13 May 2016 at Oliver's home in Statesboro, Georgia. We casually talked about the jasmine in bloom, the thick Georgia humidity, and a litter of red fox pups that played on his porch that morning. His wife, Sue, occasionally joined in the conversation. Oliver was 85 years old.

Oliver: Good morning.

Rice: ***Yes it is. Pleasure to see you again.***
Welcome. Good to see you again.

Let's start with your boyhood. Did your parents encourage your interest in biology or natural history?
No. Not a thing. My father was a farmer—a dairyman—and also a barber. My mother was one of the old South ladies who enjoyed the social life of a small Southern town. Neither one of them went to college. So there was no boyhood interest in biology from my parents. I always liked being in the woods and going hunting in the fields. But I was leaning toward medical school because my grandfather was a physician and his father was a physician.

James H. Oliver, Jr., Fuller E. Callaway Professor of Biology Emeritus, Georgia Southern University, 2016 (photo by Kay Rice).

You mentioned hunting in the woods. What did you like to hunt?
Quail, quail. Yeah.

At some point in your life, you decided you wanted to attend university. How did you make that decision?
My mother and father divorced. I was in high school and I didn't know what I wanted to do.

Were you a good student?
Jim: No, not very. I was a good school athlete and party guy. [*Laughs*.]

Sue: But you were more than that; you were the class president and you were a leader.

Jim: Oh yeah, I was captain of the football team, basketball team, and ran track and played tennis in state [tournaments].

Sue: It was a small country school. He had maybe 50 in his class. The football coach would take Jim out of math class to go over the plays. I came from New York City area [and] had 500 in my graduating class. Ninety-five percent of them went to college. I couldn't even believe what he didn't get [in high school]; prior to college [he] was sort of a blank slate [*laughs*] in education.

Jim: My brother was an electrical engineer at Georgia Tech—honor roll the whole time. He says to me, "I want you to enroll in Georgia Tech after you finish school as a senior." But I don't like physics and math. But I felt like I had to do something athletically. I really wasn't big enough to do the [sports] I wanted to do in university. But I was frustrated and decided to go to the University of Georgia. I like animals, so maybe I'll be a veterinarian. That was acceptable to everybody but the trouble was you had chemistry and a lot of other meaty courses. And I thought I wouldn't do well, [but] I was into boxing and I could compete that way.

You went into boxing at the University of Georgia? Were you a good boxer?
Yeah. I won the state championship in my weight—the Golden Gloves.

Did you ever get knocked out boxing?
No.

Did you ever knock out an opponent?
Yeah. [*Laughs*.]

What's the quickest round you ever won?
Probably second or third round. I was so good at it because I was in good physical condition—*great* physical condition. I had a coach that said the one's that's in the best physical condition and can keep his left jab going all the time and don't try for a knockout—just hammer him [would win]. It was very good advice, because after the second round my opponent would usually get arm weary and I'd block him by keeping my hands up. That's how I won most of my fights, out of pure physical condition, and I was coordinated and fast. So then I found what I wanted to do; I'm not going to be a veterinarian, I'm going to be a boxer—a professional boxer! Well, that wasn't well thought out. [*Laughs*.] My brother, and he was always a scholar, said, "My god, you can't do that. You're going to have a brain concussion!" "Yeah, but I'm quick." I was finally talked into not doing that and leaving the University of Georgia. I went to Georgia Southern 'cause it was only 50 miles away from home and I liked teaching as well. So

I'll become a high school biology teacher and coach. That was my goal for several years until I decided I don't want to do that. I think I can do more interesting things—I'll just become a college teacher. All of a sudden, I thought "I'm going to turn myself into a scholar." I joined a classic book club 'cause I didn't have any exposure to the classics.

Do you have a favorite classic?
Not really. That was short-lived! But it actually stimulated me into going to graduate school.

Did you have any challenges as an undergraduate student? You came from a small rural school to a state university.
A lot of time, I cut classes. But I realized that if you were going to go on, you had to get a graduate degree.

If you cut classes, you probably didn't do well academically?
Not until about my sophomore year, and then I decided that this was foolish, and I was wasting everybody's time. Once I decided that, I made the dean's list from then on until I graduated. Majored in biology. Was a student assistant teacher. Published my first scientific paper.

What was your first scientific paper?
It was in ornithology.

Ornithology?
Yeah. I really liked bird watching.

Well, you certainly liked shooting them.
And eating them! [*Laughs*.] But we had to do a student project in ornithology class. That was my first scientific paper: unusual nesting behavior of the brown-headed nuthatch. So then I thought, I'll just go on to graduate school and study ornithology [at] Florida State University. But the ornithologist was not particularly outstanding and I thought, well *damn*. So there was a parasitologist there—Bob Short—and he studied blood flukes. I was impressed with him. He had an NIH grant, which I didn't know what it was, [but] I did my master's degree on one of the life stages of a parasitic worm. But I was starting to get more academically interested. And what do you have to do to do this stuff? So I looked at successful people, and what did they do to distinguish themselves? They published scholarly papers and have

James Oliver with his 1950 Golden Gloves Light Weight Championship trophy (photo by Marlin Rice).

foreign experience. At the same time, I was drafted.

Drafted while you were at Florida State?
Yep. For the Korean War. The draft board had been giving me extensions because I was getting good grades. I just let myself get drafted in the Army. I told the draft board I didn't need any more deferments. So when my number comes up, call me. And they did. After I took some tests, [the Army] sent me to a biological warfare research center. It was a new program called Specialists and Professional. The idea behind it was that [the Army] didn't want entomologists to be cooks and mechanics. They were going to have this special program if [the draftees] have various characteristics and were bright enough.

What year was basic training?
1954-1955. The army told me to go to Frederick, Maryland. It was a secret biological warfare facility and that intrigued me: studying ticks, mosquitoes, and the pathogens they transmitted.

Human pathogens?
Yeah. We knew the Russians were involved in biological warfare. So I did that and that's where I met Sue. She was at a girl's college in Frederick. She couldn't get married until she finished college, so I went to Johns Hopkins for a year, but I wanted to do a worldwide, broader program, and so, when she graduated, we married, and then I moved to [University of] Kansas.

What were you doing at Johns Hopkins?
Medical entomology. I also was waiting on Sue for a year to finish Hood College. I was working with Lloyd Rozeboom and he was a mosquito person in the School of Public Health. I was only at Johns Hopkins for a year. I wanted to broaden myself and get more entomology, so I went west to Kansas.

Let's go back to the biological warfare program. What was one of the most interesting aspects your Army team was investigating?
It's a really interesting camp with Civil Service people and 500 soldiers like me that had special training and aptitude.

All working on biological warfare?
Of some kind, in crops and bacteriology.

You said crops?
Crops. Yeah, plants. Just use your imagination. These are the things that would be very important in a war. If you want to bring a nation, like Russia, to their knees, destroy their agriculture. We felt more threatened, more so than we needed to be, but they didn't put me in crops or bacteriology. They put me in the entomology branch and I had never had entomology.

This sounds typical of the Army. They put you in an area where you have no expertise.
But I am a biologist, so that's where I started working on ticks and mosquitoes—how to produce a lot of them. Drop them out of airplanes. Everything was very hush-hush, very secret. I'm still leery talking about it, because I think they might put me in jail because I'm delivering secrets. [*Laughs*.] It was a crazy time.

How do you do a defensive application of ticks and mosquitoes?
We would run all kinds of distribution tests on where these things go when you release them and what were the factors that would cause the migration. Can we drop them out of airplanes and how do we get the bugs to the enemy? That was the thing we did. So I did my two years, plus a year at Johns Hopkins, then we got married and moved to Kansas.

Who was your advisor at University of Kansas?
Ralph Barr—a mosquito guy. But when I got there, they had hired Joe Camin,

James Oliver and Jerry Rozen trapping raccoons for ticks on St. Catherine's Island, Georgia, 1983.

who was an acarologist, so I transferred professors from Ralph Barr to Joe Camin [because] I got interested in ticks and mites.

Harvard biologist Stephen Jay Gould, in an essay published in* Hen's Teeth and Horse's Toes*, cited your doctoral research on the mating biology of an earthworm mite. What was the element of fascination with this mite that parasitizes earthworms?
From a biological standpoint, it's a very interesting life history. As a behavior, earthworms deposit eggs in the soil and these little mites get onto the earthworm when it makes its cocoon; it would encapsulate these little mites. Under a microscope, [you could see] these mites swimming around in the [earthworm] yolk. I had an NIH [National Institutes of Health] grant to go to Michigan to study these mites. Joe Camin said I was the only student he knew that had gotten their own NIH grant to do the work, so here I was feeling pretty good. [*Laughs*.] So that was for the life cycle of the mite in the cocoon.

Did the NIH grant provide a stipend to you?
Yeah. It was very impressive to me. I don't remember the amount, but it was *more* than enough to be a graduate student.

I was doing a little reading on your earthworm mite. There was something about the chromosomes of the mite that determined the sex of the progeny.
Yeah. You really are up on this, aren't you? Nobody else has ever said that to me or would be interested. [*Laughs*.] But the way it works is, if there is bisexual reproduction, they [the larvae] are going to be all females. And if there is no mating, the [larvae] are going to be haploid and all males. And that's the way of sex determination. That led me to really get interested in genetics—cytogenetics, particularly—because I was studying the chromosomes. I hadn't thought about earthworm mites in a long time.

You finished your Ph.D. at University of Kansas; then what was your next position?
The next position was actually at the University of California–Berkeley.

There is a legend that you had three job offers.
Yeah, I did. [*Laughs*.] It was a lovely time for a student to get out and look for jobs. One was Illinois State University. I took the job at Berkeley, but it didn't pay as much as the one in Illinois. It paid, at the time, a really good salary compared to what I was offered at Berkeley.

What would a really good university salary be in the 1950s?
Ten thousand dollars. Everybody said that your experiences at Berkeley would be so much *richer* long-term, although it's not going to pay as much money as Illinois State University, but long-term, financially, you'll be better off. And it will be much more interesting with the colleagues and you've got prestige and all that. So I took the Berkeley job.

Where does Australia fit into this sequence?
Australia was before I went to Berkeley. It was one of the most exciting and fulfilling years ever. I was from the Southeast, and here I was, going to Australia. This happened while I was finishing my degree at KU. And it was a situation where it was a different world. Animals were different. Plants were different. And people were different; fortunately they spoke English. [*Laughs*.] But I went there with the excuse of studying chromosomes with Michael James Denham White, an Englishman who was transplanted to Australia. He had written several books on animal cytogenetics, and I thought it would be good to associate with him. While there, we got to travel from Melbourne to Adelaide, to Brisbane, to Sydney. It was just wonderful.

And you're collecting ticks in all these locations.
Yeah. Supposedly. [*Laughs*.]

That means that you were also doing something else then?
Yes, yes. I was exploring the people and culture and geography. It was really a wonderful year because I had gone from a KU graduate student, [to] Berkeley, just almost…well, I didn't even go to Berkeley. I was hired, and Bob Usinger, who was at Berkeley, allowed me to take a year's leave of absence to go to Australia and they would hold the position for me.

So Robert Usinger was the department chair.
He was.

He hires you, but allows you to not show up for a year and instead go to Australia?
Yeah, and with a secured position so I didn't have to worry about interviewing [later]. It made a lot of pressure come off. It was a very good year for me. I learned so much about cytogenetics and learned how an international scientist operates.

Usinger must have had a lot of respect for you as a young assistant professor to allow you to take a year sabbatical leave.
That's right. He said, "You'll be much more valuable to us after your year's experience at National Science Foundation expense than ours, but we'll be happy

to have you come back in a year." Life is good! [*Laughs*.]

It was good for you.
It really was. I made so many valuable contacts and associates there. It was so broadening from an intellectual standpoint and a behavioral standpoint. And it was probably one of the best years I've ever had. It was just great. And when I came back, I had a job.

You mentioned that Australia has unusual animals. What was the most unusual animal on which you found a tick?
I found ticks on snakes. There was a graduate student whose specialty was herpetology, and he would bring in snakes from his collecting. We would examine them and collect the ticks. You know, the herpetology people, they get kind of casual with snakes [*laughs*] and these big stumpy-tailed lizards. He would have them in a cloth sack. These herpetologists would go out with these sacks looped in their belt and [*slaps his hand against his leg*] that was a dumb thing because they [the snakes] could bite right through the bag. But anyway, Peter [the herpetologist] would come in if I wasn't there, open the office door and throw that sack in the office. And I'd come in and see that sack moving and I know there's a snake in there, but I don't know what [species] it is. In Australia, unlike the U.S., most of the snakes there are *poisonous*! I wasn't about to go in there until I got some information. He had tiger snakes.

Tiger snakes are highly venomous.
Yes! And very aggressive. You dump some [snakes] on the concrete, and most of the snakes here [in Georgia] wiggle around and go somewhere else. But there, tiger snakes would come toward you. That was a *bad* sign! [*Laughs*.]

He never threw a bag of tiger snakes into your office, did he?
Yeah! Whatever he caught, he put in there. All kinds of reptiles that we would screen for ticks.

You left Australia and came back to University of California at Berkeley.
Correct.

And had a career there.
Correct. I loved Berkeley.

What was the appeal of Berkeley?
A continuation of my education—academically, of course. But more than that, probably it was the cultural aspect. It was across the bay from San Francisco. It was a good experience because I had spent a year in Australia and I had known a lot of people and it made all kinds of bridges possible. And the climate at Berkeley at that time was just…[well] the attitude, I couldn't ask for a more exciting place. A little too much! [*Laughs*.]

Why was it a little too exciting at times?
Well, I hired one of these students as a technician and she was *incredibly* bright and spoke like five languages. She would study the foreign literature and read it in the original [language]. But socially, she was rebelling. One Monday morning she says, "Dr. Oliver, I've had the most interesting experience, and we're going to have another one." It was really a wild place in Berkeley at that time. And she says, "We're to have a photographer—the *Look* photographer." That's a magazine. "And they're going to interview us at our party."

Yes, I remember* Look *magazine.
And I says, "Well, what are you going to do at the party?" She says, "A lot of people think we go in and dance naked and that sort of stuff." And I said, "Sounds good to me!" [*Laughs*.] But she says, "You don't have to take off your clothes at the party if you don't want to, you are welcome to join us and disrobe in this room over here, or you can just keep your clothes on." And I said, "Then what?" "Well, we sing songs, and play guitars, and dance." I said, "Dancing! That could lead to all kinds of things." She said, "It's up to the individual. And this next Saturday, the *Look* photographer is going to be there." And I said, "Nooooo! I'm *not* going. Can you imagine my mother in Georgia and seeing her son? [*Laughs*.] No, no, no, no, no! I definitely won't be there if the *Look* photographer is there." So it was that kind of environment. It was just unbelievable. I had never seen such free-wheeling [behavior]. You just wouldn't want to be at that party. It was one of the reasons why I came back to the East, because we had two kids. And I didn't want to imprint them with these things as [being] okay. You have to take them out of that environment.

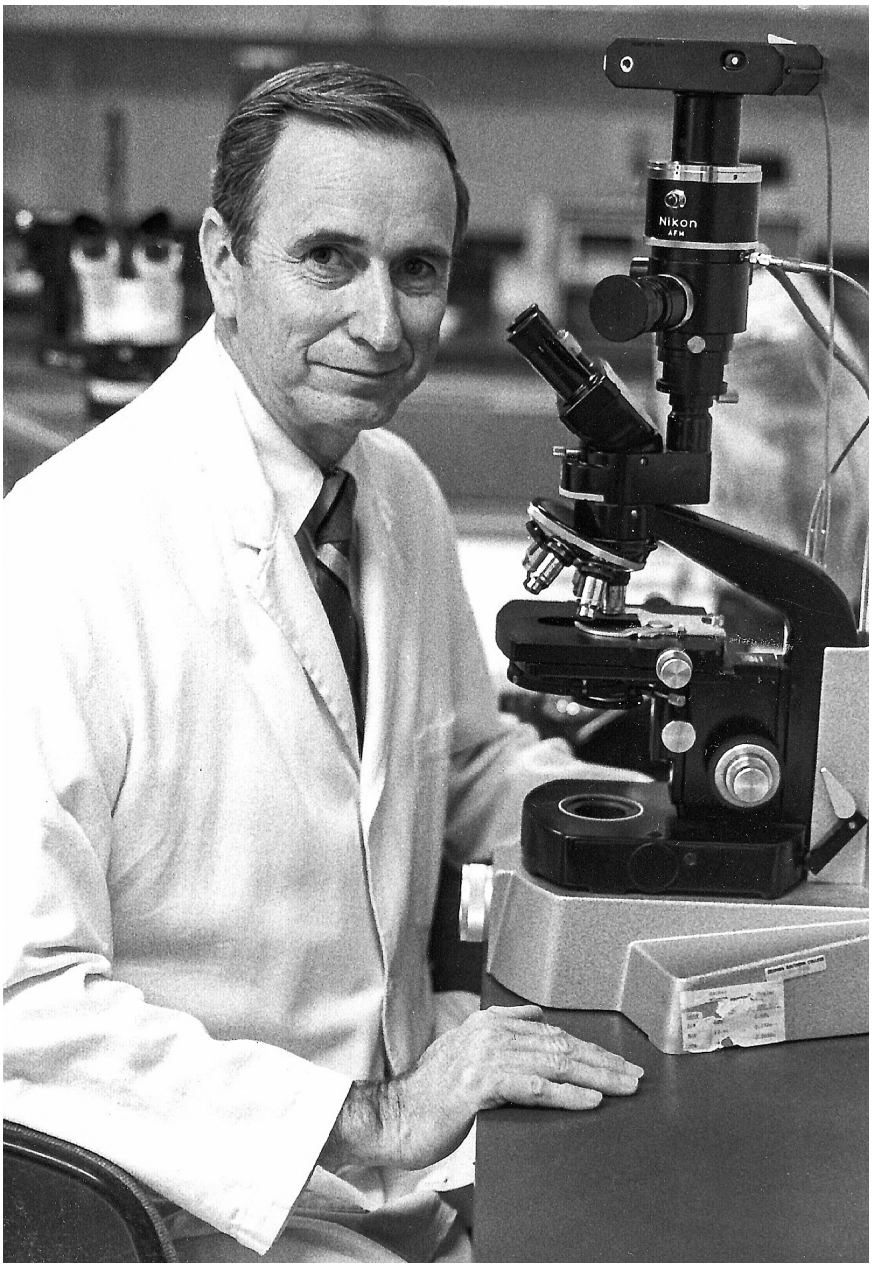
So you left Berkeley and came back to…
University of Georgia as an associate professor. Three of us at Berkeley were hired to come to University of Georgia because they had received a big NSF [National Science Foundation] grant to make good universities great universities. That was the aim. One of us was in botany, and I was in entomology, and we were given nice raises and the option of bringing graduate students we had at Berkeley. And I brought one of my doctoral students—Ziad Al-Ahmadi—from Syria. So he drove my Volkswagen bus across country.

If you lived at Berkeley, you had to have a Volkswagen bus; it was almost a requirement.
That's exactly right [*laughs*]—with stickers all over it.

You had stickers on your bus?
Yeah! Oh, they were anything: political causes, sexual freedom, and flowers, too. It was typical impressions you would have of the Berkeley graduate student in the '60s.

What color was this van?
Green with a little white. I bought it brand new. We had moved from Berkeley to Athens (Georgia) and I had Sue and two boys, and a big German shepherd.

You came back to University of Georgia, but you didn't stay there. Shortly, you went to Georgia Southern University.
I was in Athens one year, and the dean I interviewed with in Athens moved to be president at Georgia Southern. He calls me from Statesboro and says, "It would be good, Jim, if you could come down to Statesboro. There's a new program called the Callaway Foundation where the Callaway family is giving money to establish [distinguished] professors on most of the state colleges." My friends, when I left Berkeley to come to Georgia, thought I'd lost my mind [*laughs*] and now they are going to be further surprised when I go on to a smaller school in the state. So I said, "I'm going to need a lot of things." "Like what?" "Oh, you know, like money, technician, support and that sort of stuff." And he told me to list them and we'll see what we can do. During that year, we talked by phone quite a bit, and finally we agreed I'd be a Callaway Professor here at Georgia Southern, which would be the first Callaway Professor in the state. He said, "It would be a natural because you are a graduate of Georgia Southern." He had a brilliant mind, 'cause it would be



James Oliver in his laboratory, 1982.

good for students to see someone that had been a student there to come back and we can do a lot for each other. And I says, "You're right." So we were only at Athens one year, and that's how I ended up as the first Callaway Professor at Georgia Southern.

This distinguished professorship, did they give you a bump in salary?
Oh, yeah! A big bump. The first year I came down here, I had the assurance of the president that I would be supported, and I applied for three grants: National Science Foundation, NIH, and another was an Air Force thing. I got all three! And all the proposals were overlapping, so I couldn't accept all of them. You just can't imagine how, all of a sudden, I had three national competitive grants. So I didn't have to worry about support, and I stayed with the NIH grant.

And you got a technician and lab support. It sounds like a sweet deal.
It was. And I left the most prestigious place at Berkeley to go to [Georgia]. Harry Hoogstraal—you probably don't know him?

Yes, I know of him. He was a tick person working in Africa.
He worked for the U.S. Navy civil service and lived in Cairo, Egypt. Yeah, [we were] good friends. He was the one that told Sue, "Don't let Jim go to Georgia." In the meantime, I had gone to Cairo for a year with the family, and that was during the Israeli Six-Day War, which was an interesting experience.

You took a year and went to Australia and then a year and went to Egypt.
Jim: Life was sweet.

Sue: It was exceptional. [*Laughs*.] The whole time we were in Egypt, [President Abdel] Nasser would be giving three-hour evening talks about America and how awful we were supporting Israel. It was saber-rattling all the time, but the people in Egypt were fine with us, and I never felt in danger. And all of a sudden, the French withdrew all of their citizens and embassy people. And then the English did it; they're usually the last ones out, [but] the Americans were the last to leave. And the whole time, I'm thinking, "This is nonsense, the Egyptians aren't ready for any kind of military anything." I thought somebody was overreacting, but I have to give credit to the American Embassy; once they decided, all women and children were out of Egypt within two days. And we left our husbands behind, and at the airport, the women just went crazy, crying and screaming, and clutching at their husbands, so here I am, standing with two children—four and eight.

Are these Egyptian women?
Sue: No! American women. They just lost it. One woman started it and the rest just followed along. I wanted to smack some of them. "Get control—there are children here!" They were really scaring the children. We were leaving Jim behind in a very uncertain state and, according to these women, never to be seen again. So the trip home was completely a nightmare. I went and stayed with my parents in New Jersey for two weeks and then went back to Berkeley. Jim didn't know what was going to happen to him. He was there doing research, so the [U.S.] military said, "Why don't you go to Addis Ababa [Ethiopia]"—where there was NAMRU 2 [Naval Medical Research Unit 2]—"and do some work there until this all blows over?" So he closed up everything and got on the plane. About an hour out of Cairo airport, the pilot came on and said, "Ladies and gentlemen, we were the last plane

out. The Israelis have bombed the airport and [destroyed] all planes on the field."

This was the day that Jim left Cairo?

Sue: Yes! He was up in the air and everyone on the plane realized they would have been at the airport if they had gone any later. They left at night to go to Addis Ababa. He already knew someone in Addis; a roommate he had at Johns Hopkins. He was an Ethiopian national and was director at the Haile Selassie Imperial Lab. And his name was Asseffa Tekla. Jim was very well taken care of in the Tekla home and had a wonderful time, but back here in the States, we had no idea where he was! We thought he was still in Cairo having a horrible time under house arrest. We didn't have a cellphone and we didn't have computers. So he sent me a cablegram and it took three to four weeks to get to me. In the meantime, they realized he wasn't going to get back to Cairo, so they said, "Why don't you go to Uganda?" The Navy was going to have a collection trip and they put him on as an acarologist, so he did some collecting for the Armed Services. Again, being in academics, you have friends everywhere. In Uganda, he stayed at the Rockefeller Institute with John and Evie Nichols, who had been at Berkeley, and he had a very nice time. So after that he went to Kenya and working at ICIPE for a couple for weeks, and they all decided there was no going back to NAMRU [in Cairo] for any foreseeable time, so he came home, back to Berkeley. But it was an exciting time.

So basically you were apart for two months, not knowing exactly his location or condition, while he's hopscotching around East Africa.

Sue: [*Laughs.*] Having a great time with all his colleagues, but honestly, we had no idea where he was until I got the cablegram. I thoroughly enjoyed our times abroad, but there were some hairy situations.

You mentioned you knew Harry Hoogstraal and were good friends. I read that you probably know everybody in the world that works on ticks. That has to be a special fraternity.

Black-legged tick

Jim: It is, and I have been so blessed. A month ago on a Sunday afternoon, I get this phone call, and it's one of my Japanese colleagues and he wants me to come to Japan. I love Japan, and it would be a pleasure to go back for a visit. But I've broken my hip and I'd be a burden.

Let's talk about Lyme disease. In the book* Cure Unknown—Inside the Lyme Epidemic, *author Pamela Weintraub described you as a "world-class entomologist" for piecing together the puzzle that is Southern Lyme disease. Give me the story.

The whole thing is fascinating about Southern Lyme disease; it really is very different, but the clinical [symptoms] are the same. There is a rash, disorientation, and that sort of stuff, but the vectors, that is the important thing. I had a hard time convincing people that we had Lyme disease in the South. A great friend at Harvard had described a variation on *Ixodes scapularis* as a different species.

Ixodes dammini*?*

Yep, and I told him I'm not sure it's a separate species, because if you take the characteristics and go north to south, you'll find a gradation. No, he told me that Harry Hoogstraal thought the one we have here is a separate species. I said, "I disagree with that. I think it's a continuum of the same species that goes up and down the whole coast." But he fell out with me because of that. I had visited with him and had stayed in his home, but all of a sudden, when I disagreed with him, I became an enemy.

I believe you published some research, which showed that the southern* scapularis *would breed with the northern* dammini*, and* scapularis *had taxonomic priority, so* dammini *became a synonym.

That's right, that's right. You can find strains of each that are variable, but if you study the whole range of it and the variations, a lot of these quote "species" are not biologically different.

Is the black-legged tick,* Ixodes scapularis*, the only species known to transmit Lyme disease?

No, not really. It's the major one, but it's still not decided by a lot of physicians. They were impressed by the idea. There are sociological reasons why Lyme disease is reported more in the Northeast than the South: availability of physicians, people differences, tick variation. They still argue with me, and some people at CDC [Centers for Disease Control] keep pushing [against my research].

What other species potentially vector Lyme?

From a very natural standpoint, that's the main one, but from a breeding standpoint, you can get other species to transmit it.

Such as?

The lone star tick is one of the candidates, but it's still a question.

As a tick guy, have you ever contracted a tick-borne pathogen?

I don't know! [*Laughs.*] A lot of tick pathogens are rickettsia and rickettsial diseases. Every time I go to my local physician and I have some strange illness that they don't know what it is, he says it is probably a rickettsia—an idiopathic condition. I've tested negatively for rickettsia, but the symptoms [suggest it] could be.

Have you ever gotten into a challenging situation when you traveled internationally?

I've got a good story about being robbed—mugged twice in the same day! [*Laughs.*]

Where were you when you got mugged?

Jim: In South Africa. I'll let Sue tell it.

Sue: We were in South Africa for a month,

and Jim was the keynote speaker [at a symposium] in Kruger [National Park]. We arrived in Jo'burg and went to Pretoria. The next day we're out and walking toward a bus stop in front of the parliament buildings. It was about noontime, and everyone goes home on a Saturday. All the stores are closed and all the whites are gone, but the blacks are still out. Then, all of a sudden a guy comes along—*bam!*—and hits Jim and I thought he was running for the bus. And I realized, no he's not, because Jim is fighting and they are rolling around on the ground. Jim was a fighter; he was a boxer. This guy was a young man, and I guess we are in our 70s. So [Jim's] first reaction was *whop! whop!* The boy was stunned. He never expected this skinny old guy to *fight* back! He was after the wallet and easy pickings, [but] had a hard time getting it because Jim was fighting like mad. I'm screaming and kicking and pulling on the boy's hair. But he was much bigger than Jim and got the wallet. And he gets up and Jim says, "Oh no you don't!" And Jim grabs his leg and down they go again. Finally the boy gets up and starts running. Jim says, "I'm getting that wallet!" So there he goes. I'm standing there, looking like a tourist, and I'm thinking this isn't the place for me. [*Laughs*.] So I was running—it's a wide-open racecourse: there's the bad boy, and there's Jim, and there's me in the back chugging along screaming at the top of my lungs. [Then] this black kid comes up and goes straight to Jim and I thought, "Oh no, it's an accomplice!" Jim thought the same thing because he had his fists up, but it was an undercover policeman. He said, "I can catch him. What does he have?" "He has my wallet." He says, "Okay." And off he goes. He could have been in the Olympics. He took off like he had a motor. So then it's bad boy, cop, Jim, and way behind, chugging along, is Sue. We ran a couple of blocks and the cop got him. Then a Jeep-thing police vehicle came up and out steps this big white Afrikaner, with a moustache, and I mean he was *big*. He got that bad boy and he's shaking him and he got the wallet and handed it to Jim. He says, "I want you to come down to the headquarters tomorrow and file a complaint." We said, "We can't, we are going to Kruger." He says, "Well then, we can't do anything." So he grabs this boy and he says something very harsh in Afrikaans and he takes this ham-sized hand and whops him on the side of the head and the kid goes rolling, then he took off and ran. This Afrikaner turns and says, "If I were you, I'd go back to my hotel." "We're on our way!" [*Laughs*.] We're walking along and kinda' thinking we were lucky: we got the money back, we're not hurt, and nobody had a gun or a knife. Then Jim says, "Watch it!" And *another* one hits us! Not ten minutes after we left the cop. Jim is in a clutch with the guy and pounding on him. And again the kid looks *stunned*, like what's this old guy doing? [*Laughs*.] And every time he came around I kicked him and I'm yelling and screaming because there are cars going by—it is a major street. A car came up and two white men got out and that boy saw that and he thought, I'm out numbered, so he gave Jim a major push [and ran]. But nobody got our money, but we were mugged *twice* in less than an hour in day two of a 30-day stay. Oh, the Afrikaner [hosts] were so embarrassed for us.

Lone star tick

A fun story. On a more serious note, what do you consider to be one of your most significant contributions to the science?
Whoa! I don't know. Let's defer that.

Well, how about your legacy?
Let's defer that one too.

One more question then: is there such a thing as a good tick?
Yeah, when it supports my work! [*Laughs*.]

[Oliver asked to provide a written answer to the contribution and legacy questions; his response was provided a month later.] ***What do you consider to be your most significant contributions to science?***
The blending of entomology and parasitology in addressing fundamental questions in biology. More specifically, my work on sex determination and chromosomes in mites and ticks, and the demonstration of the widespread occurrence and importance of haplodiploidy among mites. Also, the occurrence of several types of sex chromosomes, i.e. X-O, X-Y, and multiple sex chromosomes, and their widespread presence in different taxonomic groups were very important. Later in my research, and perhaps more of a practical interest, was the recognition and demonstration of Lyme disease in the southern U.S. It was not only important in the northeastern U.S.; in fact, other researchers have shown it to be important in the western U.S., and now it is known to occur worldwide. Interestingly, Lyme disease is very complex and shown to be caused by several species of spirochetes, and transmitted by several species of ticks. In my lab, we continue to be involved in research dealing with various genetic strains of spirochetes; some are pathogenic while others may not cause Lyme disease.

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Additional Reading

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