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Oral History Number: 120-010b
Interviewee: Glen Kohls
Interviewer: May Vallance
Date of Interview: circa 1978
Project: Bitterroot Historical Society Oral History Project

May Vallance: Dr. Kohls, what year did you come to the Hamilton Valley?

Glen Kohls: I came in April, 1927, as a student from Montana State College at that time, now Montana State University in Bozeman.

MV: You came on the request of Dr. [R.A.] Cooley, was it?

GK: Yes, the head of the department of entomology at Bozeman. He was also state entomologist and was also secretary of the Montana State Board of Entomology, which was overseeing some of the work on spotted fever in the Bitterroot.

MV: You just spent that summer?

GK: I spent the next nine months.

MV: Oh, I see.

GK: Well, I spent a full year. I came over in April at the end of the winter quarter, stayed all that summer and through the next year, and then took up the spring quarter in 1928.

MV: Where was the lab located at this time?

GK: The old one down here by the—which is now the Ricketts Museum, the old Canyon Creek schoolhouse. That was 1927, and they moved from therein to the first unit with the present laboratory in April of 1928.

MV: Who were your co-workers at that time?

GK: Co-workers at that time: Harley Sargent was my assistant, came on at that time. He was virtually a native here, and he was quite an outdoorsman, and we needed somebody that was well acquainted with the geography of the valley and the animal life and that sort of thing, so Harley was a natural for that. He remained with us until he retired with the rest of his career, some 30 years was at the laboratory. He was my assistant during that time and subsequently, too. Oh, and at that time at the laboratory, my immediate supervisor at the laboratory was Frank O'Donnell. He was the administrative assistant for the State Board of Entomology. He was in local charge for the State Board of Entomology by whom I was employed. So, he took care of

the administrative, but he didn't have anything to do with the scientific work. I was responsible to Dr. Cooley in Bozeman.

MV: Oh, I see. Just what was the nature of your work?

GK: Well, I was sent over here to attempt to colonize a small insect, which was a parasite, which parasitizes ticks. Dr. [Emile] Brumpt in Paris, France had been working on that, and Dr. Cooley was in touch with him and an experiment had been set up in, I believe it was 1926, on Naushon Island, Martha's Vineyard rather, off the coast of Massachusetts to control ticks there. The ticks were very—they didn't know that they caused disease there, but they were a great nuisance to people who vacation there on Martha's Vineyard. Since they were coming to the states to do that, Dr. Cooley got a sample of these parasites, and I helped him rear them in the laboratory at Bozeman. Then when spring came, Dr. Cooley wanted me to take these things over to the Bitterroot, set up the laboratory here to propagate them and to release them in various areas of the Bitterroot Valley and in the state.

MV: When you came back, then, you continued with that project?

GK: When I came back to...Let's see, I went back to school and finished my junior year, and stayed in school, then. I came back that summer, the summer of 1928, and then went back to school in the fall and finished my bachelor's degree in June 1929. Then I was on full time at the laboratory and working for the State Board of Entomology until July of 1931, when several of us [who] had been employed by the state of Montana were taken over by the United States Public Health Service.

MV: You had a special project that you mentioned working on for quite some time, in which the—I don't remember exactly what it was, but you mentioned that it was an unsuccessful one, but the doctors tried so hard to find some way of combating this disease by a special study that you had done.

GK: Well, this whole thing was an attempt to control the tick. These little parasites would lay their eggs in the immature stages of the tick and the developing larvae in there would eat the insides of the tick and kill them. Of course, it's only the adult stage that attacks man, so by limiting the numbers of the immature stages, we hoped to control the adults.

MV: But it was because of the shortness of the season.

GK: Because of the shortness of the season, primarily. There's only one generation a year, and (unintelligible) and the adults came out ready to search for new hosts to parasitize just at the time that those immature stages were going into hibernation, so the life cycles of the two organisms were not synchronized.

MV: Just what exactly is the nature of the disease of the spotted fever? How does it react?

GK: Well, the only way it is acquired in nature is through the bite of a tick, the bite of an infected tick. Now, not all ticks are infected, and the most highly infectious areas on the west side canyons here, I think the highest ever recorded was around 11 percent of the adults, which accounted for the fact there's people here in the valley who grew up in the canyon, were on the irrigation projects, and be bit many times and nothing would happen. Yet one person coming in, maybe a stranger or whatever and go up there on one trip, get bitten by a tick, and subsequently died from the disease. So it took quite a bit of convincing of many people in the valley that ticks had anything to do with the transmission of the disease.

MV: Was there quite a high death rate in the valley?

GK: Yes, the highest that was known any place in the west where spotted fever occurred. It's considered about 80 percent, had a case fatality rate of about 80 percent in people over the age of their early 20s.

MK: Do you have any idea how many in this valley died from it?

GK: I couldn't give you that figure offhand. Those figures are available and in some of the State Board of Entomology reports. I would say several hundred reported.

MV: Why do you think it was that the lab was situated here when we had the University of Montana in Missoula?

GK: That was quite a question at the time. The thing that...The university wanted it on the campus. They wanted it down there. Whether or not they would have had it on the campus, I can't remember now, but one site that was considered was the sugar beet factory west of Missoula. The Amalgamated Sugar Company had a big factory there and there were grounds out there, and I think about that time they were considering closing that. Sugar beets were beginning to decline in importance in the Bitterroot, and space was available out there. Again, that was away from populated areas and they could have animal houses and all the things that go along with an experimental laboratory. But Dr. Cooley and others on the Board of Entomology believed that it should be kept in the Bitterroot Valley because it was closer to the fieldwork that was being conducted.

MV: You did mention that so much of the work was through field—

GK: Yes. The reason the laboratory was situated here in western Montana and in the Bitterroot Valley in particular [was] because of the high case fatality rate. So the first lab that they had here was situated, oh I think they called it the first lab, was down at Sweeney Creek just near Florence. That was just a summer laboratory. Just the time that the tick season was active, and then they had one at Victor in 1911—

MV: Now, is this when Dr. [Howard] Ricketts came?

GK: Ricketts came in 1906. He came in 1906, he was a professor. He was on the staff of the Medical School of the University of Chicago and he came out. I think the first trip he made out there was during Dr. Cooley (unintelligible) all about it in the stories (unintelligible). I think it was 1906. Dr. Cooley met him in Missoula. Those were horse and buggy days. He became acquainted with Dr. [E.W.] Spotswood, who was a prominent physician at what they call the Northern Pacific Hospital in Missoula, which is now the Missoula General Hospital. Dr. Ricketts was given laboratory facilities on the grounds there at that at that hospital. That was his headquarters and he could travel from Missoula out to Florence, Lolo, up O'Brien Creek, and then he'd come on up the valley and stay overnight at the hotel. There was a train running at that time, too, and of course, (unintelligible) ran for several years after that. He would go up and stay and Dr. Cooley would show him around and introduce him and so on, and he would be able to collect animals in nature and ticks and blood samples from people who had the disease. I think I told you that there's a Mrs. McKinney here in town that was a person. I believe she's still living. As a child, she had spotted fever, and Dr. Ricketts took a blood sample from her. He eventually showed, definitely, proved, that the tick was the agent and perhaps the only means by which human beings could contract the disease, and showed that it was a disease of animals in nature and man entered into it accidentally by getting into their environment and becoming parasitized or bitten by infected ticks, which ordinarily feed—their natural hosts were deer and other various large-sized animals. When livestock was introduced into the valley in the 1860s, well, of course they very important hosts. Mountain goats.

MV: When you used these experiments in the lab, what kind of animals did you use?

GK: Animals that were used in the laboratory for the study of the disease were primarily rabbits and guinea pigs. Again, Ricketts was one who demonstrated that guinea pigs were susceptible to the disease. He could grind up ticks and inject them into guinea pigs and produce the disease, which he could prove by blood test was the same disease that was attacking human beings. Therefore, you could study the symptoms and all that. The same way with rabbits. He showed that that was the way; it wasn't by drinking water from streams in which there was rotting sawdust along the bank on the old mill sites on the west side here.

MV: Who was it that finally developed the serum that was used on children in—

GK: The first effective vaccine was the so-called Spencer-Parker vaccine. [Roscoe] Spencer was a medical officer in the United States Public Health Service, medical officer. Dr. [Ralph] Parker was, after 1928, was in local charge of the research work, and those two working together developed the vaccine.

MV: Now, in one of my other interviews, the name of Dr. Yamaguchi comes up. Didn't he-

GK: Dr. [Hideyo] Noguchi.

MV: Oh, Noguchi. Was not he also a developer of a certain kind of vaccine?

GK: He made a vaccine about 1923. I think he hyper-immunized either guinea pigs or rabbits or horses, I forget which now, but, by injecting them with massive doses of blood (unintelligible) beings as I remember reading about it. He tested it on Japanese section hands on the railroad here. People at the laboratory weren't much interested in receiving the shot. [laughs] I'm certain Dr. Parker never took Noguchi's vaccine, or Spencer, but I'm not sure of that. I'm not sure. But anyway, it became apparent, there had been quite a bit of spotted fever among railroad workers out along the tracks, you know, in a suitable location to acquire and be bitten by ticks. But it was soon demonstrated that it was not effective, and from there they went on—Spencer and Parker had continued to work with—they provided space for him to work for Noguchi. I think they worked down here at this little laboratory.

MV: What was the feeling of most of the people in the valley regarding the fact that the lab was here and all of this work was being done? Were they afraid of the activities? Did they like to have this lab here?

GK: Some did and some didn't. For economic reasons, some felt that the publicity attended to having a laboratory like this here studying a problem, focusing on it, had an adverse effect on property values, and they did not welcome the thing here, the laboratory. But by and large, it was received by the community—they were more interested in doing something to eradicate the disease, and they were frightened of the high death rates and so, whether it affected land value or not, the main thing, if the valley was ever going to blossom out and develop economically, they felt that the research work had to continue to develop a vaccine, and what not.

MV: Are children still receiving the vaccine?

GK: No. They stopped that some few years ago. With the advent of the antibiotics, that really spelled the end to that. They soon proved that they had these antibiotics, certain ones of tetracycline, if you diagnose the case early enough and administered antibiotics, the chances for recovery were virtually 100 percent. The vaccine that had been used, that was a protected prophylactic vaccine, was not that successful. Actually, as far as I know, as I remember now, there was only one death in a vaccinated person in the Spencer-Parker vaccine. You could get the disease. If you were infected with a highly virulent type that occurred in the Bitterroot Valley and certain other places in the West, you can still get the disease, but your chances of recovery were virtually 100 percent. Now, in southern Idaho where the case fatality rate, oh along the Snake River and all, it was a very important disease of sheep herders and outdoors people out there—cattle ranchers and so on. The case fatality rate was around three or four percent. The vaccine seemed to give complete protection against the disease.

MV: Is the Bitterroot Valley the only place…Now, you mentioned Idaho. Are there other places in the West and the Rockies that you find this disease?

GK: Oh, yes, in every state, practically. That used to be, but it's declined in recent years. I think if spotted fever was diagnosed, it was shown to be present in in virtually every state. I think there was only four states when I stopped keeping…being interested in the figures on it. Maine had no cases, and two or three other New England states elsewhere…that occurred in varying amounts each year, depending on population of the states and other factors, too.

MV: But, actually, it was doctors at this lab that pinpointed the fact that that disease came from the tick.

GK: Yes, that's right. Based on the work of Ricketts. Ricketts was the one that demonstrated that that was the case. Of course, he was able to do that in some way because others had begun to work out the life cycle of the wood tick. You had to have pretty much a knowledge of that, which was provided by certain experiments that Dr. Cooley supervised here in the Bitterroot. Even, I think, before 1906, they had a fair knowledge of the life history of the tick: how it operated in nature, the fact that it took two years from the time the eggs were laid to the adult stage and so on. So he had a foundation that way. Ricketts himself carried on some experiments, too.

MV: You mentioned that the Colorado tick fever and spotted fever is transmitted by the same tick.

GK: This is transmitted by the same species of ticks, yes. Males and females both can transmit it, but the male tick is probably more dangerous because of this one thing: an infected tick has to be attached to feed for a matter of at least a couple of hours. You can go out in the hill, get ticks on you, maybe have one attached, but if you examine yourself frequently, get the ticks off, you won't get the disease. A person that goes to bed at night, sleeps, and hasn't removed the ticks, why—the male tick will move around. A female tick attaches and stays there. The male tick will feed for a while, a few hours and then that stimulates the mating activity, and they'll go in search of females and attach someplace else. There were a couple of incidences which it was pretty well shown a single male tick infected three children, three kids sleeping in one bed as they did often times in those days. They found only one tick and it was a male on one of the kids. They all came down with the disease. So that is an interesting angle on the way the disease was transmitted.

MV: Now, as the lab grew larger, did it confine itself just to the study of Rocky Mountain fever?

GK: No. Early in the game, early in the in the work, even 1924, while they were at the old laboratory, they recognized that there were other diseases that were transmitted by the tick, too. One of the first to be recognized, that was tick paralysis. That was known in the northwest here for, oh, since I think one the earliest publications I can think of now is 1912. It was

considered mainly a disease of children. The tick that caused it was the same tick that occurs here in the valley, but it is caused by the female ticks only. The male tick does not, possibly because of the feeding habits of the tick. The female tick has to be on and attached for two or three days and so on. That was studied here quite early and carried on quite some number of years and definitely showed that there were not a living organism connected with it; it was a toxin that was injected at the time the tick was feeding. That was one and then tularemia was studied at the same time. That was recognized about 1918 in California, and it takes its name from the county in California in which it was discovered: Tulare County. Parker and Spencer showed that that was a fairly common disease first recognized in sheep. Now, tick paralysis also will affect sheep as well as human beings, and it affects dogs and cattle. That was studied intensely along the same time as spotted fever. Then in what was the late '30s, probably, they started experimenting with Colorado tick fever. It had been shown that that was caused by a virus. Quite a bit of work was put on that.

MV: Well, now, during—

[Break in audio]

GK: Just before the war there were two diseases here that the lab was interested in, which became of some importance to the personnel here at the laboratory. Dr. Harold Cox was brought here. Speaking of vaccine a little bit earlier here, they soon recognized that the vaccine for spotted fever was costly and quite cumbersome to make. Dr. Harold Cox was brought here to the laboratory to try to devise a new method, a better method for making spotted fever vaccine. To make a long story short he was very successful on it. He found a way of cultivating the needed organism that causes of the disease in fertile hen's eggs. He didn't have to raise these thousands or a million ticks a year which you had to do to make it by the old method. The Cox-type vaccine became the vaccine that was used to vaccinate people after the Spencer-Parker vaccine. The tick vaccine was no longer used. From that work, Cox found that the organisms grew very well in hen's eggs.

There was a great need, then, of work on, for an effective vaccine against louse-borne typhus which always follows in the wake of wars and general worldwide disruption. It killed more people, lost more to typhus than died in certain areas in World War I. They were deathly afraid, really, too, that the third one huge outbreaks of louse-borne typhus. Cox made a vaccine here that was very effective in animals, and they had no way of testing it against human beings because there were no human cases occurring in which to try it, here locally, anyway. At the time, I think it was about 1942, (unintelligible**),** which was American Cyanamid Company in New York, became interesting in manufacturing the vaccine. The government was issued huge contracts for huge amounts of it. So Cox went back east to the Lederle Laboratories in Pearl River, New York. He took with him Les Antoine, who was on the staff here at the laboratory. He was in the mechanical shop. They set up the vaccine-making program for Lederle Laboratories at that time. All the typhus vaccine that was used by the Armed Forces then was the Cox-type vaccine. There was not a single case of louse-borne typhus in the allied forces as a result of this

vaccine. There were several cases. It was field tested in Naples where they were considerable groups of outbreaks of typhus in the native populations.

Later on, then, there had been a vaccine devised for yellow fever. Of course the war was being conducted in areas where yellow fever was endemic, and there was work going on on yellow fever since 1928 or before. Actually, Noguchi, who was at the Rocky Mountain Laboratory, dropped his work on spotted fever here and went with the Rockefeller Foundation to West Africa to study yellow fever. Lo and behold, that's where he got acquainted with Dr. C.P. Phillip who was over there working with the Rockefeller Foundation and Gordon Uday was (unintelligible). He developed a vaccine for yellow fever, but again, it was not effective. He made some mistakes and it didn't work out. But, others devised a vaccine and it was prepared with the use of human serum. Now, Dr. Mason Hargett, who led the Public Health Service worked on that problem in Brazil. They did it there because they knew that yellow fever was occurring in certain parts of Brazil and they had a ready source of the virus. He perfected a method of making the vaccine, bypassing the use of human serum. Some of the vaccine they made with human serum that were carrying along the agent in there of infectious hepatitis in people received the vaccine shots for yellow fever were coming down with infectious hepatitis. That was no good. He devised a method for making a vaccine, substituting something else for the human serum. That blossomed out at the laboratory here, a whole floor of a building was taken over and all the vaccine used by the Allied Forces in World War II, then, was made here at the Rocky Mountain Laboratory under the direction of Mason Hargett. He had several others working with him: Nick Kramis, Clarence Robinson, and others, I've heard. Harry Burress was really his right-hand man who worked on yellow fever with Phillip in West Africa and also with Hargett in Brazil. He brought him here to work with him at the laboratory as his right-hand man and manufacturer of the yellow fever vaccine.

MV: What has happened to all of the tick equipment and everything that was so outstanding here when the serum was being developed and all? It still isn't it the lab, is it?

GK: No. That work is all gone. A commercial company took over the manufacture of the spotted fever vaccine when it was found it could be made very successfully and cheaply and so on. By the cultivation of the organisms in fertile hen—

[Break in audio]

MV: Okay.

GK: Yes, so as I said, the vaccine, was taken over by a commercial company, so we didn't have to rear all these millions of ticks to make it. But the work continued on ticks from the standpoint of how spotted fever occurred in nature, and also in connection with other diseases that were transmitted by ticks, such as Q fever and Colorado tick fever. Then, in recent years when, after Dr. Parker's death in 1948, he was followed two or three others, I can't name them, until Dr. Phillip and later Stoner. The direction of research changed from field-oriented research

to laboratory, indoor-oriented research. So that whole section of work at the laboratory was dropped. The collections and library were transferred to the Smithsonian Institution in Washington, where they are now.

MV: I see. If we were to go back there, we could see where this was?

GK: Yes, you can see all the collections we had in cases here at the laboratory, and one of the first ones (unintelligible) went with him, and he is there, working on the collection at the Smithsonian now.

MV: What year did you retire, Dr. Kohls?

GK: I retired on the first of, my last day was October 31st, 1969. That's when I finished. Dr. Clark Clifford succeeded me. He had come several years earlier to be my successor. I followed Dr. Cooley when he retired from Bozeman, from the state of Montana. Came over here in 1931, and he worked until 1936…'46, he retired, and I took over from him. Then Dr. Clifford took over from me. Now Dr. Clifford retired last October and Jim Kerns (?) has gone back to Washington with the collection.

MV: I see. Well, thank you very much. I appreciate this.

GK: You're welcome.

[End of Interview]