LOYE HOLMES MILLER
THE INTERPRETIVE NATURALIST

INTRODUCTION

RAYMOND B. COWLES

Emeritus Professor of Zoology
University of California
Los Angeles, California

The cultural contribution of memoirs and records such as these of Professor Loye Holmes Miller lies in the perspective with which they provide us. Whatever form they may take, such records heighten our appreciation of original environmental conditions, and of time, and change.

Professor L. H. Miller's gift to his contemporaries, whether students of all ages or to his fellow scholars, will through this collection preserve values extending far into the future. Here is the record of a great naturalist, his observations, and his interpretations of nature and especially of the biotic-environmental changes that, for good or ill, may transpire within the mere lifetime of a man. This changeable and dynamic aspect of our dwelling place is clearly revealed in these documents, and they should serve as a guideline by which to judge our cumulative trespasses on nature's realm.

Knowledge does not insure the development of wisdom as to the permittable control of our environmental depredations, but it is indubitably the indispensable basis for such wisdom and planning.

These tapes and records are merely the tangible evidences of Loye Holmes Miller's contribution to our society. Far greater than the records reveal were his unnumbered intangible gifts to those who would listen and read. As a teacher, Loye Miller was largely content to transmit and dramatize knowledge and thus elicit in his students and fellow workers the vivifying effects of his own enthusiasm and participation. Because of his love of people as well as of untrammeled nature, his highest ideal was this transmittal of information to others, the "passing on of the torch of knowledge." As he himself pointed out, every accurately and well-informed teacher passing through his classes and out into the wider world beyond the campus would, and still continues to, multiply, for decade on decade, this knowledge, understanding, and the possibility of yet greater collective wisdom.

Those of us whose fields of intellectual endeavor paralleled or impinged on his have all encountered great numbers of those whom he once taught, and in whom he kindled the enlivening enthusiasm that made them good teachers, too.

From his early youth, "Padre," as he enjoyed having his younger colleagues call him, was endowed with superb natural perceptive senses of the world around him. He particularly revelled in such details as form, texture, color, sound and rhythm as expressed in nature and thus he inevitably came under the spell of avian study.

Through his keen enjoyment of the aesthetics of his environment, and as a result of his love of accurate reporting, and of these gifts in conjunction with his warmly gregarious and understanding nature and communicative skills, he was a superlative teacher. All of the tangible records that entered into his career are now collected here for the benefit of those who wish to expand their insight into themselves and their environment.

Possibly the most urgently needed knowledge and wisdom at this time, and covered by these documents, is the amount of change that can take place in the life of one man. It is the magnitude of change revealed by Miller's records that should alert us to the prospects in view for present fathers, their children, and their grandchildren.

It is ecologic wisdom such as Loye Holmes Miller's upon which the nature of our future depends, and that of all Californians and others. If they have a perceptive and tolerant mind they can now read and combine his information with that of others, and if it is not already too late, do much to preserve a pleasant world.

INTERVIEW HISTORY

WILLA K. BAUM

University of California
Berkeley, California

The following memoir with Loye H. Miller, 1874–1970, was put together by the Regional Oral History Office from several tape-recorded

interviews, as a part of a series on Forestry, Conservation, and State and National Parks. In the fall of 1969, a combination of a letter from Herb Evison, retired head of the Information and Education division of the National Park Service, to Mrs. Amelia Fry, of ROHO; the fortuitous visit of doctoral candidate Leonard Askham to the Office and volunteering of his services as interviewer and editor; and a donation of typing money from former director of National Parks, Horace Albright, allowed the Office to undertake the memoir.

INTERVIEWERS AND DATES

Mrs. Lois Stone, 21 March 1967.

Leonard R. Askham (B. S. Humboldt State, 1963; M. S. Recreation, 1968; forester with U.S. Forest Service; doctoral candidate, dissertation on nature study programs), 17 October 1969.

G. Davidson Woodard (Professor of Geology, Sonoma State College), 9 October 1969.

John B. Cowan (Director of Gray Lodge Wildlife Area, State Game Refuge, Gridley, California), 20 September 1967.

A talk for the Association of Interpretive Naturalists, Inc., by Loye Holmes Miller, 20 March 1969.

PROGRESS OF MEMOIR

Professor Miller agreed to do an interview with Leonard Askham for the Regional Oral History Office in October 1969. This interview and a previous one conducted by Mrs. Stone for the Donated Tape Collection of the Bancroft Library were transcribed and the transcripts sent to Professor Miller for his editing. He sent to the Office a copy of the tape he did with Professor Woodard and that also was transcribed. All of these were gone over by Professor Miller.

In returning them on 20 January 1970, he wrote: "I have gone over these scripts with considerable care, in order to make them 'readable' without making them sound 'written.' In face-to-face talk there is always the slight gesture, the pause, the accent, the facial expression—they do not show on the tape-recording. I have therefore made a few changes—not enough to disfigure the impression or even to hide all of my weaknesses.

"These changes of mine are suggested only. They are made in red ink."

In March, Professor Miller went over the final typed transcript of the three interviews. He returned them along with a copy of his talk to the Association of Interpretive Naturalists, Inc., and asked us to get a copy of his interview with John B. Cowan of the Gray Lodge Wildlife Area. Both of those are included. Our last communication from Professor Miller was 10 March 1970.

A long-time colleague of Professor Miller, Raymond B. Cowles, Professor Emeritus of Biology, University of California at Los Angeles, was asked to write an introduction and he did so on 2 April 1970. Professor Miller had been keeping track of this progress with interest. However, he did not live to see the completion for he died on 6 April 1970.

BACKGROUND AND CAREER

INTERVIEWER: LOIS CHAMBERS STONE

MILLER: Greetings to you, my fellow students, Californians north, south, east, and west! This is Loye Holmes Miller speaking. I'm an alumnus of the University of California, Berkeley, class of 1898, and I speak at the request of my alma mater—her archivist—this spring day of 1967, on the Davis campus of the University.

I spent 12 years in Berkeley, 50 years in Los Angeles, with visits from time to time to the San Diego campus. Some years ago in Los Angeles, my good friend, W. Lee Chambers, had two little daughters who greatly enlivened my visits to his home. I would take Lois on one knee and Alice on the other and to the accompaniment of various giggles, would tell them stories.

Now, as Mrs. John M. Stone of Berkeley, Lois sits before me here with a request for more stories. She doesn't giggle now. It is she who was responsible for my entanglement in all this magnetic tape—and I do feel entangled! But I'm ready to take orders from Cal. Captain, you may fire when ready!

SOUTHERN ROOTS

MILLER: You have indicated an interest in my ancestry. My father was born in Minden, Louisiana. His father purchased land—part of the Louisiana Purchase—and the deed for that land was signed by the President of the United States. This was located at Minden, which is slightly to the south and east of the city of Shreveport today.

Mother was a Holmes-Culpepper from Alabama and Mississippi.

My grandfather Miller, of German ancestry, came to this new and raw land; he had an axe and a rifle and a saw and maybe some other tools. He felled enough trees to build a lean-

to. Into this he moved with his young wife until he could build a log cabin. There he raised a large family, my father being number ten of 13 children.

My grandmother was Sarah Wilson. She brought with her a kettle or two, a bit of needle apparatus, probably some weaving equipment, and the two started out to fight back the wilderness.

Father's boyhood was spent here on this farm. He spent much time fishing, hunting, rambling about through the woods, and well I recall his stories of going fishing, going coon hunting, and hunting possums. He had a certain measure of skill with his hands, and he brought this skill into full flower with his senior years.

He went to war when he was a young man not yet 20, the great war between the states. He was captured and exchanged and reenlisted, and his 21st birthday was spent in Elmira Prison as a prisoner of war. He was wounded in the hip and he carried a Yankee bullet there for the rest of his life. I never knew him except as a man who walked with a limp.

FAMILY MOVE TO CALIFORNIA

MILLER: When we came to California, in 1877 it was, I was two and one-half years old. We came to California and lived for a while in a little board and batten shanty; one board thick were its walls. There were two main rooms and a lean-to kitchen.

I recall very clearly, when I was a very small child, seeing father laid out on two 1×12 boards across two saw horses or benches, laid out there on a blanket, and beneath him a bucket to catch any dripping blood; and the old long-whiskered doctor, Dr. Gill, went into that hip, cutting two cross marks, and tried to find the bullet. He was not successful.

You have asked about my father's education. Well, I don't really know. But I do know that both my parents were people of refinement. There were no well developed schools in those days, but I know that they had the regular reading, writing, 'rithmetic education, and father, when a teenager, actually taught school for a little while before he went to war.

However, he was self-educated in dentistry and in jewelry. There were no dental colleges in those days, but with his manual skill he developed an ability in dentistry which he practiced in Louisiana and which he brought with him to California. His whole equipment was packed away in a handbag-sized case, some of the tools of which I still have today.

I remember some 40 years later, a little old lady who had been our neighbor speaking to me said, "Loye, you see these teeth I'm wearing?" And I looked. She had a beautiful set of upper teeth with just one little nick out of the corner of one incisor. She said, "Loye, your father made those teeth for me 40 years ago in order to pay the tuition of your older brother Guy at a private school." Isn't that interesting?

STONE: That's amazing. That really is.

MILLER: Some of you have asked, "Why did he come to California?" Well, there was good and sufficient reason. After that terrible war between the states, the whole system of living in the South, the whole economy, was upset. The whole political situation was changed. The South was a conquered people. The slaves, who had been our mainstay, were liberated (thank God for that!), but our possessions were wiped away as well.

My grandfather had accumulated considerable amount of property and was considered a man of means, but I recall my dear old Auntie —older than my father—speaking of the soldiers who were stationed throughout the South after the war. Some of them were stationed there at Minden and they came to our home, or Auntie's home.

She said to me one day, "Loye, I remember the soldiers coming and how we hid everything we could. I took off my gold watch and gave it to a tall, lanky darky girl who slid it down into her skirt pocket. I never saw it again. But the soldiers came in and wantonly took their sabres and chopped great marks on the polished wood of my piano."

STONE: Oh, how dreadful.

MILLER: Yes, isn't that dreadful? But soldiers were trained to dreadfulness. Sherman's march to the sea was *war* and, as he defined it, "War is hell." I believe him.

Now, isn't there plenty of reason why we should come to California, a new raw country in 1877. Father came on ahead the year before, '76. I have, of course, very few recollections but some of them are quite clear.

I have one picture in mind of my dear old grandmother Miller, as I stood beside her knee, and she fed me little sugar-coated pills just for the fun of it. They had no medicine on them, but they tasted sweet.

I remember crossing a large river, on a ferryboat of some sort, I suppose. I know not what river it was, probably the Mississippi. I remember little after that, except when we changed cars at Lathrop, here in California, and changed to the railway coming south toward

San Bernardino and Colton. That was in '77. The train stopped at Lathrop and people could get something to eat. They led me, of small size, up to a big, wide cage in which there was a grizzly bear. That grizzly bear is clearly seen in my mind today, and he looked as big as an elephant. I suppose that was the Central Pacific depot. I don't know.

My next recollections were of my boyhood and, of course, there's a lot of that in my little book, *Recollections.*

STONE: Yes.

MILLER: You ask here, or once in a while, something about personnel of my school days in southern California, some of the people who impressed me and to whom I owe much. One of these was Miss Eugenia Fuller, my teacher in the seventh grade, eighth grade, and all the way through high school. She was a remarkable person, very human and very much interested in her boys. I remained one of her boys as long as she remained alive.

She taught me to skin and prepare a bird specimen.

STONE: How did *she* learn?

MILLER: She learned that by practicing, and she was also active with a group of older boys who had learned to collect and prepare bird skins, Theodore Hurd, an older boy, Fred Johnson, Billy Price, and a few others—Ray Lyman Wilber, for instance, who later became Stanford University's president.

Well, she, as I say, kept her interest in me, and under her urging, I finally got to Berkeley as a student.

Another teacher who impressed me was Miss Sarah L. Dole. She was a remarkable person; educated in the classics, she taught a class in Greek, but she was my science teacher, teacher of chemistry, physics, and she just opened the whole world of botany to me by teaching me how to identify flowers from a key in a little old book, Rattan's *Botany of California.*

STONE: I know it.

MILLER: There were the boys, W. W. Price, known as "Billy,"—Billy Price was a bird skinner and bird stuffer and egg collector and this, that, and the other; I told about him, I think, in my *Lifelong Boyhood*—Theodore Hurd, Fred Johnson, and so on. But my big brother Guy was one of my constant companions. He and I grew up almost like twins, except he was a big, roly-poly fat boy; I was a wiry, skinny, sickly little boy, known commonly as "Scrub" and later as "Stubb," which name still clings to me when I confer with my sister.

STUDENT DAYS AND EARLY PERSONALITIES AT UC

MILLER: You have asked about my attitude toward the University today. That is hard to say. Only this I would say: in the words of an old poet, "Rome, Imperial Rome, who sat upon her seven hills, and from her throne of beauty ruled the world." I feel just that way about the University of California and her nine—or now more?—campuses, from which she doesn't rule the world, but from which she has sent out those who have influenced the world.

I am proud to be a member of the University of California, north, south, east and west, and long may she live! "Rome, Rome, thou hast been a tender nurse to me."

What were personalities and courses of study that I pursued way back? I arrived on the Berkeley campus a very forlorn freshman from the raw back country and I was greatly pleased to join such an institution. It had 1200 students and we didn't know what was going to be done with them. And the little upstart university down at Stanford—we didn't know where there was room for two universities in the state of California. But I guess Stanford has made good enough, even though she did wallop us in football once in a while and we did the same to her.

One of the first contacts I made when I went up to campus with one of my colleagues, I saw an old gentleman in a long black coat and soft hat and grey beard, and as he passed some of the students who were ahead of me, the students took off their hats. That was dear old Dr. Joe LeConte, one of the great, great personalities, not only of Berkeley, but of the whole field of science, east and west and abroad.

I was fortunate enough in my senior year to take a lecture course, just one, a three-unit lecture course in structural geology. I remember to this day: he made things so plain, so clear, that I neglected to take notes—unfortunately —because it seemed as though, why *anybody* would know that! That's the way Joseph LeConte lectured. I have a picture of him, taken by one of my fellow students. He is standing at his lecture desk, and on his birthday, the students decorated his desk and the blackboard behind it, and they gave him some little present.

STONE: That's very nice.

MILLER: A student took a snapshot of it. I paid ten cents for a copy. I would be happy to place a copy in the archives.

STONE: They would be delighted.

MILLER: William Emerson Ritter was professor of zoology. I didn't get so well acquainted with him because I registered in the college of chemistry and I didn't have any zoology until I was a junior, and then Ritter and Harry Beal Torry were my instructors in general zoology (elementary) and with Torry I took some special problems later.

John Campbell Merriam I saw as a young man about the old museum which they had in South Hall. He had come from the Middle West to study with LeConte. I got better acquainted with Merriam after I became a graduate student and especially when we went to the John Day fossil beds of Oregon. That also is accounted in my *Lifelong Boyhood.*

STONE: Yes, very delightfully.

MILLER: One other man particularly, William A. Satchel, botany.

STONE: He was my professor too!

MILLER: Dr. Satchel, I was fortunate enough in taking a course from him in general botany, and his lectures were to me a great inspiration because he had a way of presentation which in later years I profited greatly by. I owe much to William A. Satchel.

Professor Rising, W. B. Rising, of chemistry, Edmond O'Neil, of chemistry, Walter Blaisdell, of chemistry—all did for me much in that subject. But chemistry was dropped after I graduated. I never took any more chemistry. I was just born to be a biologist.

I took German, scientific German, one course with Dr. Henry Zenger. He was a charming person and not only was he charming, but he took a personal interest in all of his students. One day he came to me on the side, and he said to me, "Mr. Miller, haf you a dress suit?" I gasped. Why would *I*, a ragamuffin student, have a dress suit—which of course I did not have. "Then," he said, "I tink I can get you one. I hope it vill fit."

STONE: What did he think you would want it for?

MILLER: Well, in those days, it was customary for formal occasions to wear a dress coat. Even when I went to Honolulu where it was hot, tropical country, I had to have, when I went out, a dress suit. And for the first year I was there, I wore the dress coat and vest that Professor Zenger had supplied me with as a student.

STONE: How nice.

MILLER: When I wanted to get away early in 1896 to take that trip to Baja California, which is given in my *Lifelong Boyhood*, I went to Professor Zenger to see if I could get a special examination. He said to me, "Ach, Mr. Miller. You know enough. Go ahead. You are all right."

Another personality which I recall, and by whom I've profited much, was the lieutenant who was in command of the University Cadets, Lieutenant Frank L. Winn. He was transferred by the Army just before I graduated. But he encouraged me to go on and take the junior and senior years in military science. There I learned to stand straight, speak clearly, and throw my voice at the 300 men and get results.

My feeling ever since has been, in order to command, you must first learn to obey, and obey now. Only then can you expect people to take your commands. And young folks today, I think, lack a great deal in their respect for constituted authority. Now you don't always like that authority, but if you don't like it, it's your job to see, perhaps, that it is corrected in the right manner. Don't try to correct it yourself right now. You aren't quite as old as the people who made those laws, and by the time you are, maybe you will see that they knew better than you do. So, Frank Long Winn taught me things.

My professor of English was William Dallam Arms. He was a young instructor then and like young instructors (and properly) he was enthusiastic. He brought me into a better acquaintance with good English prose, literature of this or that or the other sort.

I saw, moving about the campus, Eugene Hilgard—charming old gentleman—Bernard Moses, and of course, Colonel Edwards in mathematics, and so on.

OFF-CAMPUS FRIENDS

MILLER: You have wondered if there were not people outside the University who had an influence upon my life. Oh, yes, yes! I lived a lot of life outside the University.

One of the first impressions I received outside the University was from a girl. I remember perfectly well in my freshman days, I went to the First Congregational Church, and there in the anteroom of the church, I saw a girl with the most remarkable eyes. I remember her eyes better than anything else, it seemed to me. She had beautiful eyes.

Well, I was smitten. And for the next four-plus years, I saw more and more of that girl until we became quite well acquainted. I saw her every day. We went on walks in the hills. We studied the flowers. We studied the birds, and we had good times.

I was young. She got the notion that I ought to be her husband. But I was not in a posi-

tion to do anything serious, and she was only 5 years old when I met her. That little girl, Madie Hatch, was one of my chums all through college, together with her little sister. Her father was minister of the First Congregational Church, and the home of Mr. and Mrs. Hatch became a second home to me.

Then there was dear Auntie Henderson and Uncle John Henderson, their daughter and their two sons. They were delightful folks. Every Sunday, practically, they seized me at church and took me home to a good square meal, as well as a home environment which I very much appreciated as a lonely bachelor boy.

Then there was another girl. When I was a senior, I guess it was, or first year graduate, I was at my home in Riverside where I always went after a year of college. I called on a family, neighbors of ours, by the name of Holmes, by the way—he was editor of the daily paper in Riverside—Elmer W. Holmes. He had a daughter who had come to Riverside just a year before I had as a small child. But she had gone to one school and one church in one direction; I had gone to another school and another social church group in another direction. I knew that there was such a girl, but didn't care a hoot, as you might say that!

Well, when I was at home that summer and called (she had hoped to go to the University at Berkeley), her father jokingly said, "Well, when this poor little freshman gets up to Berkeley, kind of keep your eye on her."

I didn't take him seriously at the time, but it became a little more serious as time went on and I went off to Honolulu in 1900. But I came back in '01 and picked her off the commencement stage and took her to Honolulu at the beginning of our 50 years' honeymoon. She kept the light burning for half a century.

Then there was what we called the Boys' Club in west Berkeley. West Berkeley was a sort of "shanty town," way down there on the edge of the Bay. It had a soap factory and a tannery and a railway station, and that was about it. There was a carpenter shop. The boys of west Berkeley were just boys, but someone—I know not now who it was—started a boys' club. Once a week I used to go clear down to west Berkeley, walking there and back to save the five-cent fare on the little mule car, and taught a class in handicrafts in this west Berkeley club. I understand that west Berkeley has changed a great deal.

STONE: We still have trouble.

MILLER: I'm sure that the smell of that tannery must have passed and the delightful smell of coconut oil from the soap factory probably has gone with the wind, but maybe there are some descendants of my west Berkeley boys and an influx of some others.

NATURAL HISTORY TEACHER AT UCLA

MILLER: Now, about Los Angeles. I was there from 1904 to 1959. I went there from my teaching assignment in Honolulu and was appointed as teacher of natural history. We called it nature study in those days. It was a good assignment; I enjoyed it immensely. I found when I went there that they were trying to build a higher education school. At the time I went there, people could enter the normal school from the eighth grade, or by examination. But there was a change in administration, and a new president, Dr. Millspaugh, was brought in from the Middle West to build it into a freshman, sophomore school of education, with hope ultimately of making it a four-year college of education.

I, having just come from Honolulu and from Berkeley where I took my Master's, was supposed to have a pretty good acquaintance with the situation in Berkeley; and we, being part of the state educational system, wanted to make the tie between Berkeley and Los Angeles as close as it could be made. So for 10 years, I was chairman of the committee on admissions and had to examine all the credentials that came in from applicants from this high school and that high school and the other. Even one from Russia.

I had to get her credentials translated!

I learned that the teaching experience of our graduates, the average teaching experience, was three and one-half years. Most of them were girls. They taught for one year, two, three, and then, something else.

I got a letter not long ago from one of my students who had been in one of my classes just 50 years ago, and she said she was writing me because she wanted to thank me for what she had gotten in natural history. Because, I said to myself when I went there, "These students are going to be here only a short time. I must give them something that they can take away into civilian life; I must teach them something, perhaps, that will help them make a living. But that is not all. I must teach them how to live while they are making it."

I have never discarded that attitude since. And I have been rewarded by people writing to me again and again that I gave them something. That encourages me immensely.

STONE: You deserve it.

MILLER: I also tried to say to them, "When you go out to teach, teach live things, or about

live things. When you're indoors, you're learning about things; when you're out-of-doors, here are the things!"

So every opportunity I had, I took them out-of-doors, even though it was right in the middle of the city (we had a 5-acre campus). There were some trees. There were leaves. There were butterflies. There were bees. There were birds, there was sky—the out-of-doors, in other words.

Study live things, not just *about* things. The laboratory is just as essential as the field, but the field is just as essential as the laboratory. A student in medicine has to work with a scalpel to learn the anatomy. He has to work with a centrifuge to learn the biology of the bloodstream. He has to work with a chemical test tube to learn the chemistry of the body fluids. Yes! But his *use* of that knowledge is the live patient with whom he may some day come in contact. And we hope that the live patient may be still living after he gets through with him. So that is one thing that I inaugurated in the old state normal school.

RESEARCH BIOLOGIST

MILLER: A lot of folks have asked me how I became a research biologist. Well, I think I was born that way. I don't know anything else, but Dr. Millspaugh, our president, sent me for the first year around to visit a great many of the southern California high schools in order to present to the people there in that school the possibilities of the normal training.

While I was there, I met men and women who did nothing but teach seemingly, as far as I could see. I came home and I said to Mrs. Miller, "I think I'll have to get out of teaching." And I even went so far as to take a summer course in human anatomy in a college of physicians and surgeons, thinking that I might become a doctor. Well, I didn't become a doctor of medicine.

One of my colleagues, Calvin O. Easterly, coming down from Berkeley to a small college in Los Angeles, said to me in a complaining sort of voice one day, "I don't see how you get any inspiration to do research down here." I said to him, "I get it by seeing those who don't have it." Unfortunately, he thought I meant him. I didn't because he was doing good research. But that is the truth. I got much inspiration to do research by seeing those who didn't have it.

Dr. Millspaugh was very patient with me and very appreciative of what I wanted to do and did do. Later Dr. Earnest Carrol Moore, who became president after Dr. Millspaugh, was also very considerate, although he thought I should be writing about methods of teaching and he didn't see very much in my studies of biology, but he let me go ahead. I sort of had to do my research behind the door, so to speak, but it was fun and I kept doing it.

My staff at the normal school in zoology was one—I was that staff. When we became part of the university, I built the zoology staff from scratch, I being the scratch.

Now you ask me about my staff, who they were and what I got from them. I got something from every one of them. They were all, naturally, my juniors for I was expected to pick them out. I got Bennet M. Allen, the world renowned authority on the secretion of the "hidden glands," so-to-speak, those peculiar glands—the ductless glands. My junior colleague, Raymond B. Cowles, I brought there as a youngster. He became a world authority on temperature regulation. Sarah (Sally) Atsatt was a great joy. She was an enthusiastic teacher and the queen of all outdoor campers. She helped a lot.

My junior officer, Adrian van Rossem, was a patient man with me because he did all the driving when we went on field trips for research after I retired. I owe a great deal to Van Rossem. He had no bachelor's degree even. I ultimately got him an honorary doctor of science from his alma mater where he had not even graduated.

STONE: You were going to tell us about Knudson, I guess, next.

MILLER: All right. Other men whom I met were not in zoology. Vern Knudson was an outstanding man, well known—internationally known. He later became head of the institution there at Los Angeles.

Lee Kinsey—delightful person, and his wife, likewise. They sort of mothered me in my old age. Another physicist was Leo Del Sasso.

And I had lots of folks down in the machine shops who were patient with me when I wanted to make apparatus. I did a lot of that sort of thing because nobody else could do it and nobody else knew just what I wanted, so I made it myself.

A friend of mine, Dr. Frank Clark, was a practitioner, and he and I used to comb the beach together to pick up skeletons of animals, birds, and mammals that had drifted ashore. I had accepted a lectureship in the College of Physicians and Surgeons in Los Angeles, at their invitation and without salary, and I taught, for 3 years, gross anatomy of creatures from amoeba to man.

I had coined a saying which I used for them, that "anatomy is the servant of function." Not

that one developed before the other, but function excused the anatomy, and the anatomy permitted the function. That has stuck with me ever since.

ACCOMPLISHMENTS

MILLER: Then all at once, I discovered Rancho La Brea, the great asphalt beds, and I went down there to gather specimens for my lecture course at the College of Physicians and Surgeons. But I got so busy with the research on Rancho La Brea material that I had to give up the lectureship and devote myself to the birds particularly of Rancho La Brea, which ultimately constituted my thesis for the doctorate.

Of one or two things I feel that I am justified in being proud. I was asked to write a history of the U.C.L.A. Zoology Department. I declined, because I would have to use the first person singular too much and I didn't want to. But I'm going to brag about two things anyway.

MILLER: One is that I started from one part of one bone, the study of fossil birds on the Pacific Coast, and the only publication was about that one part of one bone. By now, I've handled probably one hundred thousand fossil bird bones and I have inspired, or started, at least, a whole school of avian paleontology in the West. There wasn't any before.

When I spoke to John C. Merriam about this subject, I said, "I can't find any literature on this subject." "Well," he said, "you'd better make some."

So I published and published and published about fossil birds of the West Coast, and finally Merriam said, "Well, why don't you make that a thesis?" And I was practically handed the doctor's degree on a platter!

STONE: You must have been a good professor.

MILLER: The other thing that I think that I can brag about is that I developed a harmonious department of zoology. We worked together, we talked together, we thought things out together. And when a weakness was recognized in one phase of biology, we tried to bring in the man or the woman who would fill that niche in general zoology. And I must say that it kept us mighty busy because zoology was just burgeoning into what we have today, and I don't dare say *what* we have today! "Zoology" is almost a stranger to me.

MILLER: There's one more point I wanted to speak of and that is our relation to the marine station at La Jolla. Some years ago when Dr. Robert Gordon Sproul became President of the University, he appointed me a committee of one, you might say, to try and bring the La Jolla station into closer relationship with U.C.L.A. So I thought the best thing to do was to get on my little tin wagon and go down to San Diego and see what was going *on* there. So I did.

I was received with the greatest of cordiality, and so far as I know, I'm still on the committee because I haven't been fired! But I have made use every opportunity I had of the facilities offered me *gratis* at San Diego. Particularly is that true of the work in oceanography offshore. Dr. Harold Sverdrup, who was director for so many years, as he sat in my office one day (I cruised with him once or twice) said to me, "You know, padre, the whole purpose of this study we are making of the ocean, its chemistry and physics and everything like that, is to understand the ocean as an environment for living things."

STONE: That's most interesting.

MILLER: Now, that came from a physical oceanographer. He was not a zoologist, but was an internationally known physical oceanographer.

So I made every use of the boats. I was given a warm welcome and told to make myself at home on ship or ashore and I did so. During some 10 or 15 subsequent years, I made studies of the surface forms—the birds, the oceanic birds—and it resulted in a number of papers being published on the oceanic birds of southern California and from there clear down to the Gulf of California and up into the Gulf.

It was a fascinating experience to me because while I was in Honolulu, there surrounded by ocean, I had read everything I could get hold of on oceanography. And there wasn't very much, of course, at that time in 1900. But I got an idea of the ocean as the mother of life, you might say, while some folks speak of the ocean as a waste of waters. It's not a waste of waters. It's inhabited from its surface clear down to the mud at its bottom, 5 or 6 miles down. And all the way in between! I have just written a paper on that subject, part of which has not been published, but I have placed the manuscript in the archives at Berkeley.

Now Sverdrup was a particularly encouraging person. I met there and worked with Dr. Roger Revelle, for whom Revelle College at San Diego has lately been named. Dr. Martin Johnson, now retired, was a biologist. Richard Flemming is at present head of the Oceanographic Department at the University

of Washington in Seattle. He was a classmate, or "cruise mate," a shipmate of mine. I enjoyed him immensely.

Francis B. Sumner at that time was working on his great study of the wild mice and their control, or reaction to environment. Dennis Fox (a chemist really) was studying all of the carotinoid pigments. I got great pleasure out of chatting with him and I looked him up every time I got to San Diego.

And dear old Captain Hammond, Captain Earl Hammond of the boats, wrote me a nice long letter just the other day, talking about what wonderful cruises we had had together. He was not a biologist, he was a navigator, but we had happy times, and each learned from the other something.

MILLER: Then of course, I always went over to the San Diego Zoo. I began there when it was just a little bit of a horse farm, you might say, but I made several cruises with members of the zoo and its originator, Dr. Harry Wageforth, who was a very good friend. It was a very cordial welcome I got when I went to his office. He's long passed. His secretary, Mrs. Belle Bencheley, ultimately became the first woman director of a worthwhile zoo. And she helped make that zoo known all over the world. She was succeeded by Dr. Charles Schroeder who is now the man in charge.

Mrs. Bencheley and Dr. Wageforth credit me—they say, at any rate—with having stimulated the whole zoo staff to do research upon the animal life which was under their care, and they did me the honor to make me life honorary member of the San Diego Zoological Society, which same I appreciate.

PRESENT ACTIVITIES

MILLER: Now, you ask me what I am doing here in Davis. Well, very much as I have been since I retired in 1943! I'm going ahead. I live from day to day, as all of us have to. I was at the campus this morning shortly after eight o'clock, and I left shortly after eleven, and I had an interview with one or two students. I did some telephoning. I did some writing. I did some reading on a new extinct species of animal found in Indian mounds along the Atlantic Coast. I tried to catch up with this, that, and the other.

My door there stands open. On my door is a card for engagements or hours. My conference hours are "whenever the door's open," and students are invited to come in.

Other members of the staff are busy with their teaching requirements, with their committee work. I don't teach, except individually. I don't have any committees to attend. I'm not compelled to write a thesis or scientific paper unless I want to (I have two in press today, maybe they'll come out before I die of old age), but I have there an open door for any student who wants to come in and talk. I have sometimes called myself, "Professor of Listening." The only trouble is, I interrupt and talk a lot myself!

Just this morning, there was a boy who came in to ask a question. He was born in Czechoslovakia and emigrated, when things got too tough in Czechoslovakia, to Venezuela. He is a citizen of Venezuela, but he has come to Davis to study and try and take a degree in zoology at Davis. He chatted with me for quite a while, and I with him. As he sat there, he examined some of the things I have on my desk, and I told him about them and why they were there and why, to me, they were interesting. Well, he went out, apparently interested anyway and personally, I hope he comes back.

That is what I do. I go there in the mornings to meet people because I consider them the most interesting creature that walks the earth today. I get a little out of patience with some of these harebrained idiots who try to tear things to pieces without putting them together again. They are a minority. The great, great majority, I am confident, of young people today are worthwhile, and I'm not saying to anybody that the world is going to the dogs. Not a bit of it! The world may be going somewhere—I don't know yet where, and I may never know, nor maybe you won't—but I like this world, and I'm thankful that the good Lord put me here and made a biologist out of me!

STONE: Padre, I remember when I was a student at U.C.L.A., we went out on these wonderful field trips to the desert. Very frequently, when the weather was possible, we would go out, a group of students and a group of faculty. As I recall, the students were known as the "field mice" and the faculty were known as the "sand rats," and we all wore blue jeans and we carried our food and cooked over the campfire, and then, in the early morning, when the sun was just coming up, you would make noises of birds. I recall seeing you sitting there and to my amazement, the birds flew down and landed all around you, even landed on your shoulders and hat.

MILLER: No, no.

STONE: No? but they were very near to you, almost like St. Francis calling the birds down from the skies. And what I remember most of all was your calling owls at night in some of

these desert camps, and the sound of the owl, as you called the owls down for the students to marvel, was the thing that shall live with me as one of the most memorable experiences of my student days. Can you call an owl now?

MILLER: I guess, young woman, you've returned to your childhood when I dandled you on my knee and told you stories about owls. I'm glad that you can remember that too!

Well, I did play with the owls. I remember one particular time when we had a great number of people in camp. In fact, there were ten camp fires. But at dusk I called a Great Horned Owl, "Whoo whoooooo! Whoo!" And again and again, till here came the old owl, down canyon, and sat on the rock wall just above our camp with his two horns sticking up. When I would hoot, he would hoot back. He looked for that strange owl which he couldn't see. And all the students—there were 80 or 90 people in the crowd—they came and pointed up to see the owl. "There's the owl!" "Whooo! Whooo!" That's only one kind of owl. Again and again, throughout all my field experience, I have played with these owls from Mexico to Oregon and it's been fun. Thank you for remembering.

ORGANIZING THE FIRST NATURE GUIDE SERVICES

INTERVIEWER: LEONARD R. ASKHAM

ASKHAM: The following is a personal interview with Dr. Loye H. Miller, Professor Emeritus of Zoology, University of California at Davis. Dr. Miller is 95 years old and continues working even in retirement by holding office hours at Davis from eight to eleven each morning. His afternoons are spent relaxing and writing. Several papers are now in the process of being published.

The interview was conducted at Dr. Miller's home in Davis on 17 October 1969. My name is Leonard R. Askham. I am a graduate student working toward a Ph.D in forestry at the University of California at Berkeley.

MILLER: Very good, Mr. Askham. Start shooting.

ASKHAM: Thank you. We started this idea of interviewing again with a letter from Herb Evison. He was stating that you and Dr. Bryant were instrumental in starting this nature study program. Would you tell us how it came about and how you started it?

MILLER: The nature study program in the national parks was started by Bryant and myself. It came about by Steve Mather's hearing me talk to some fellow campers at Fallen Leaf Lake in the Tahoe region.

FALLEN LEAF LAKE

MILLER: I went to Fallen Leaf Lake in 1919 to spend a vacation, a summer vacation. I camped there at the lodge, or in the neighborhood of the lodge, which was kept by an old schoolmate of mine when I was a boy, and later a colleague in field work, Billy Price (in other words, W. W. Price). I went there to get rested from a very strenuous year at Los Angeles.

He had a way of asking the fellow campers to meet every Sunday in a little building, an auditorium, and also on Wednesday evenings they would get together there, all just for fun. Someone of the group would supply a few remarks or talk or a song. I was one of these people among several. One was a sea captain. One was a fisherman. One was a forester. Your former chief for whom your building is named was there one evening.

ASKHAM: Walter Mulford?

MILLER: Mulford, yes.

It so happened that one evening I was talking about the bird notes that people around there might hear. I had developed some measure of skill in mimicry, and I talked about the various calls of owls. I am told later by Stephen T. Mather that he was passing by the open window to go over and register at the lodge. He saw people, not only in the assembly hall but standing and watching through the windows, listening to this talk. And I am told that there he got the notion of just such activity in the national parks. Well, he went on. I didn't meet him. I didn't know he was out there in the dark listening. He went on over to Tahoe.

BEGINNINGS OF YOSEMITE PARK TOURS

MILLER: I got back from one of my walks up in the country back of the lodge, and here was a telephone message for me to call Mather at Altahoe, a station down on the big lake. I called him, and he wanted me to come over to Altahoe and talk to him and with him about this very subject. He proposed that I get in my little wagon—I drove a 1914 Ford, loaded with family (I had two boys and a wife)—and come right on down to Yosemite and start now, right then and there.

Well, I didn't feel as though I could for two reasons. I had already spent my summer, and I had to get back to Los Angeles and go to work again. Second, I didn't want the thing to start off "like a rocket and come down like a stick," with no previous preparations. So I got his agreement on this; he quite concurred that we should start it the following summer in Yosemite.

ASKHAM: Was Bryant working with you at the same time on this?

MILLER: Well, that's another point which has never been corrected. I've tried and tried to get it properly recorded. I was there as a vacationer. Billy Price did nothing at that time, so far as I am aware, for the establishment of an interpretative biologist in his camp. So I, going around from day to day, was met by some of my fellow campers and was asked if they could go along with me on some of my walks.

Well, I didn't mind. I was learning a lot of interesting things, and they like the same sort of things. So one or two of them (I think they were from Long Beach) went on one or two of my walks. Some of the other folks found out about this, and they came to me with a proposition that I take them along. They would like to pay me a small fee for my services. Well, I demurred a bit but eventually we agreed. On 3 days a week—three mornings from about eight until ten or eleven—we took walks in the vicinity. They agreed to pay me fifty cents apiece or a dollar a week for the 3 days. I said, "All right. Come along."

ASKHAM: That was pretty good money then, too, wasn't it?

MILLER: In those days, that wasn't bad money and I was there at considerable expense myself and on a small salary at home.

First thing I knew, I had 15 or 20 followers. That was the work I was doing at Fallen Leaf Lake in the Tahoe region all that summer.

Now it so happened that a man by the name of Goethe, of Sacramento, had influenced the State Fish and Game Commission of the State of California to send a man to ten different centers of summer vacationists around Lake Tahoe. He was to talk with them about the natural history of the region in which they were kept. He was paid by the State Fish and Game Commission assumedly, as near as I can learn. The plan was under the stimulus of Mr. Goethe.

ASKHAM: This was in 1914 also?

MILLER: No, this was in *1919*.

ASKHAM: Mr. Stephen Mather came through and interviewed me on 21 July of that year, 1919. The following week, I think it was, Bryant and his family and Mr. Goethe and his wife in their circuit around the Lake Tahoe area came over to Fallen Leaf Lake. Bryant spent a week there as he had in other areas around Tahoe.

Somehow or other the impression got out that Bryant and I were both employed by somebody, and I, assumedly, by my chum, Billy Price—which I was *not*. Now that is a mistake that has lived 50 years or more.

ASKHAM: Well, now it's rectified.

MILLER: No, it isn't corrected. It can't be because this very good friend of mine, Mr. Goethe, now passed on, had a bronze tablet cast and mounted on a big pine stump and placed on the former grounds of Billy Price's station. That plaque still stands there with this statement on it. Unless you take a chisel and cut it off, it's there to stay.

ASKHAM: What was the statement?

MILLER: The statement was that Bryant and Loye Miller were doing the same thing, or that when he came there, he found Loye Miller doing this same work for Mr. Price, which is not the case.

ASKHAM: You were on your own.

MILLER: Yes. Furthermore, he has his own name on there: C. M. Goethe. He later had cast in bronze another plaque which is mounted upon a great granite boulder set up at Yosemite. In this he states that here under the beautiful walls of this Yosemite, Stephen T. Mather got the inspiration for the nature guide service, which is not the truth.

ASKHAM: He got it at Fallen Leaf Lake in Tahoe.

MILLER: Yes. And unless you take a chisel and hammer and cut that bronze tablet all to pieces, it still stands there. So you say that it is now corrected—it is *not* now corrected. I have written to various people stating my relation. I get very nice letters and yet again and again, there come out statements that Loye Miller and Harold Bryant were doing this work at Fallen Leaf Lake in Tahoe.

ASKHAM: To continue, you said that you wanted some time to think about your program before you started it when you talked to Mather. What did you do this next winter?

MILLER: The next winter I went back to my job in Los Angeles, and I didn't have time to think about anything else. I did promise Mather that I would come. Unfortunately, the little leaflet that is handed out to visitors when they enter the park did not carry any announcement of this service. That's what I had expected Mather to take care of. It slipped up somewhere. We know not where.

ASKHAM: This is 1920 now?

MILLER: Yes, that was 1920. So I arrived in Yosemite with my family and my little tin wagon to camp on the shores of the river there, the Merced. I found that Bryant had already arrived. I had to teach at Los Angeles until a later date so I did not arrive until late June 1920. Bryant had arrived a week or two ear-

lier. He had set up a very nice schedule of work. I examined that schedule and wholeheartedly agreed with his plan.

Every day we wrote up for the chief of the park, the superintendent, a statement of our activities together. I endorsed with Bryant this statement each morning, just as a captain reports his activity to his colonel. Those reports presumably are on file somewhere in the archives of Yosemite.

MILLER: Now you ask what we did. We worked like Sam Hill, that's what we did!

Well, we alternated. Every morning Bryant would take a group of visitors from the assembly center, which was Camp Curry, and I would take a group of visitors from headquarters, which was then down at the old Sentinel Hotel in what was known as the Village. The following morning, 5 days a week, I would go to Camp Curry and take a group of visitors, and Bryant would come to the Sentinel Hotel and take a group of visitors.

We walked about through the park for 2 hours or more, covering perhaps a mile. When you walk a mile in 2 hours, you don't make great mileage but you, we hope, do make impressions on people, and that's what we were there for. We examined the flowers, the trees. We studied the cliffs, the sky, the clouds, the breeze, the birds, the deer, the stream, the lake—beautiful Mirror Lake—anything. We answered questions if they came up, but mostly they were questions stimulated by our current talk.

We found a most remarkable attendance. I remember one morning when Bryant was away, I took 92 people out in one group. Now you would think that there would be no possibility of contacting 92 people, but when I would stop, they were as still as children *should* be in a Sunday school and just as attentive. I would move slowly about among that group and talk to all of them. And yet, in a way, I hoped that all could hear, and they listened and most of them did hear.

ASKHAM: For that day and the number of people that were in the park, that was quite a large group.

MILLER: That *was* a large group. We didn't always have one that large. I have in my notes somewhere, "This morning, Bryant had 24 people and I had 20." I just happened to look over my notes.

Now that lasted for 2 hours or 2 and a half. Then we'd call it a morning. The afternoon, after lunch, was spent in one or the other of two ways. One of us took a group of children out on a walk accompanied by their parents generally, or one or two adults. This was Bryant's scheme and it was a good scheme. I liked it very much and I enjoyed it very much because I like kids. Well, we would take these little folks out on a walk for an hour or an hour and a half.

Bryant invented little games to amuse them and to instruct them. One was a feeling game. He would blindfold one of the children and let him feel the bark of a tree, or put in his hands a bit of grass or a leaf and let him feel of it. Then there would be a sniffing game. He would take a leaf and put it up to his nose and sniff it. He would let the kids take a piece of the same kind of plant and sniff it to get a different avenue into the brain. You see, we learn by the various avenues into our brains from our various senses.

There were feeling games; there were sniffing games. Then there were seeing games. What do you see when you look around? Then there were listening games. What did you hear? Where is it? Who's doing it? All that sort of thing. Well, we just had a bully time with those kids. I had been doing much the same thing in previous years in southern California so I just ate it up myself.

While one of us was out with the kids, the other spent his time down at the main headquarters office where we kept office hours, answering questions. You can't image the number and the variety of questions that people came in and propounded to us. I sat in the office there time and again, alternating with Bryant, and finally I got one of these little hand counters that you could keep in the palm of your hand and make a little click which nobody else heard, for each question that was asked. I found that I counted up, as I noted, I remember one time, just 92 questions in 2 hours. Different questions, not by different people necessarily, but they would come in and ask, and I would make a "click." They would ask another question—one more "click."

Outside the main office, we had a flower display which was kept by one of my former students who had married the postmaster in Yosemite. She kept this flower display in an array of bottles and jars and pails and so forth, representing the different plants that would be found there. Each day she would come to refresh the flowers or throw them away and get new ones and put them in. Her name was Enid Michael. She was later appointed officially as a park naturalist, but she was not at that time. She was serving *gratis* just because

she loved it. She had been a student of mine in Los Angeles several years earlier.

The superintendent got the notion of using this little counter. He set one of the rangers out in the road in front of the headquarters to count the cars that went by. In those days, Yosemite had already been open to automobile traffic. The number of cars that went by there was tremendous.

I told you, I think, that we did this work 5 days a week. The longer weekends were reserved for excursions into the farther back country. One week Bryant would take a group up into the Little Yosemite. There was a lodge there at that time, a tent lodge where you could get meals and bed. Another would go up the trail to Glacier Point. Another would go up, perhaps, back of Yosemite Falls or another here, there, or yonder, Lake Tenaya, for instance. He would go one time. I'd go another time.

ASKHAM: So you had alternating weekends off.

MILLER: Alternating weekends when we weren't assigned to do that. But we spent the time when we were not off on the field in the office.

There was a third activity—fourth or fifth or whatever you want to call it—evenings at the two centers at Curry and down at Sentinel. Bryant would give a talk at Curry on one evening; on the same evening I gave a talk at Sentinel assembly. The next evening Bryant came to the Sentinel assembly and I went to Curry and gave a talk. We had to sandwich in our talks with various other activities that were voluntary by the campers.

I remember one time I had to talk following a Scotch comic that came on or sometimes another fellow would give a song. We had all sorts of visitors there, and I sometimes had a little difficulty in switching the attention of people from a Scotch comic to birds! But I gave a talk about birds and tried to say "birrrds" with a Scotch accent.

We were then active for 5 days of the week, morning, afternoon and night, and I was sometimes pretty glad to get home and go to bed! That's what we did.

FINANCES OF PROGRAMS

MILLER: The question has come up again and again: who paid for all of this?

ASKHAM: I was going to ask that one next, yes.

MILLER: I don't know who paid for it, but I know that both Bryant and I received nothing from Mr. Goethe. A good many folks think Goethe paid for it. He did not, so far as I could learn. Whether Mather put a little cash in the general kitty of the national parks' expense project, I'm not sure but I'm *pretty* sure he did. I think he did. My good friend, Horace M. Albright, thinks he did too.

ASKHAM: This was his own personal money?

MILLER: His personal money, but he put it into the general kitty and Bryant and I were appointed as rangers. We were assigned this natural history work—nature guide service. On the other hand, sometimes we acted as traffic directors! I remember one time I had to direct traffic out in front of the hotel there when there was a big lot of folks on the Fourth of July. Later I established the work at Crater Lake, Oregon.

ASKHAM: Oh, that's something I didn't know either.

MILLER: Well, at the invitation of the Park Service, my son Alden, who was then a college student, and I established the work at Crater Lake. There I did everything from chasing stray dogs, comforting crying babies, making a wild ride down to Medford with an appendicitis patient in the back seat with his very much disturbed wife. We got down there fortunately in time to get him into the hospital. I had to stay overnight and come back the next day and go to work. So we did what was to be done; that's the main thing. But we were kept pretty busy with the nature guide service.

YOSEMITE

ASKHAM: What did you learn from all this?

MILLER: Well, I must say I learned most as much as anybody else! It was a great delight to me. I learned to appreciate the Yosemite. Nobody has to learn that. It blazes itself right upon you, but with two or three summers-long dwelling there, I got a little more intimate with it. I learned a lot about its fauna, its flora, its geology, its physiography, and it sank in, you might say, during those long summers.

Some of the birds I met were totally new to me because I had never been in there before; for instance, the Black Swift I had read of when I was a boy, but I'd never seen it. But time and again the Black Swift came circling around over the meadows in company with White-throated Swifts. Both of them, I think, nested up in the crevices in the rocks which both of them do, I understand.

I met some very delightful little plants. I remember one was a little low-growing plant named *Hesperochiron*, which doesn't mean

much to you folks, perhaps, but I've remembered it ever since. It is kin to a little plant I had known from childhood, the so-called "baby-blue-eyes" (*Nemophyla*), only this was white with blue markings on its petals. It grew right close to the ground and it came from a perennial root. The perennial root brought it up and there it lay flat on the ground. Funny little thing. I had a visitor with me from Cupertino and he took a picture of it. I was so happy to see it. I still have that picture after 50 years.

I also met in the valley my first Sierra Hermit Thrush and heard it sing. As a boy, I had known the Hermit Thrush in winter but he didn't sing in the winter. But I knew he was a Hermit Thrush. Well, he truly *is* a hermit. I first heard him sing up near Happy Isles in Yosemite and I was delighted. That memory stayed with me for years and I finally, after I got to be an old man, wrote a little poem about it and published it in the journal of the Sierra Club. So it was a pleasure, naturally.

ASKHAM: You also imitate these birds too, don't you?

MILLER: All my life I've been, more or less, a mimic. You may call me a monkey or a parrot, I don't know which, or both! I am a field biologist. I began as a little boy, mimicking birds. My vision has never been so good, so in my study of birds I have had to call them to me when I couldn't go to them. So I developed a certain amount of mimicry. But nobody can imitate the song of a Hermit Thrush. I have it in my mind but it doesn't come out. Those are some of the biologic things that I learned at Yosemite.

EARLY PERSONALITIES IN PARKS

MILLER: Now what other questions have you? You intimated you wanted to know some of the people that we met. Yes, I met remarkable people. Everybody comes to Yosemite sooner or later apparently! Something like Davis: we are a crossroads! Of course, Steve Mather—I was greatly delighted to have him call me a friend. I met him both in Yosemite and in Washington, and in Des Moines and in Crater Lake. He was a great man and did a great work.

ASKHAM: I had a question about Bryant. Did Mather contact Bryant after he contacted you at Fallen Leaf Lake?

MILLER: That I never knew. After Mather contacted me at Altahoe, I didn't see him again until next summer. I have the impression that Mr. Goethe persuaded Mather to include Bryant which was very fortunate because he was a good man, no question about it. I always made him write these reports (I signed 'em all) because I was pushing him for a federal position in Washington as Assistant Director of Parks in charge of Natural History.

He didn't want to take it at first, but I persuaded him that his position with the Fish and Game Commission of California was a more or less uncertain position because there were a lot of politicians at the head of it.

Now, Mather was a good politician, in the right interpretation of that word. He was a jim-dandy politician. I am under the impression that Goethe suggested Bryant to Mr. Mather.

I met Superintendent W. B. Lewis, then superintendent of the park, Yosemite. He was a great boy. I met Chief Ranger Forest Townsley and his staff of rangers. They were a great gang, fine men, devoted men, devoted to their job. None of them ever got rich being a ranger or being a naturalist, as a matter of fact.

ASKHAM: You still don't today!

MILLER: They took their work seriously and devoted their lives to it. I honor them in memory—now they are all gone—but the younger men who followed them are of the same brand.

I got better acquainted with Harold Bryant and his family and his two little children. I romped with them in the clean sand on the bank of the Merced River. Bryant was a real man.

When I went on an overnight weekend trip up to Merced Lake, there was Stan Freeborn —Stanley Freeborn, a young fellow, helping ride herd on a bunch of Boy Scouts, I guess they were. He later came to Davis and was one of the first chancellors for the Davis campus. Freeborn Hall here is named in his honor. He is now gone. Then there were men sent into the park every year by the alumni of the University to give what was known as the Le Conte Memorial Lectures. While I was there as a ranger, I helped arrange things for Andrew C. Lawson, professor of geology, University of California at Berkeley. I met John Campbell Merriam who was a memorial lecturer. He later became my major professor in paleontology.

I met C. Hart Merriam. He was the father of the biological survey, now known as the "fish and wildlife." My wife and I spent practically all one day wandering about the park and up the trails with dear old C. Hart Merriam. He was there studying Indians. He wanted to collect the various plants that the

Indians had used in their medical or ceremonial work. My wife and I went around the park with him and located some of these plants.

Joseph Grinnell was one of these speakers of the memorial. Joseph Grinnell was the founder of the great museum of vertebrate zoology at Berkeley.

Albert Fall, the Secretary of the Interior, was in good standing at that time. He came into the park and I met him. I had the pleasure, at his request, of singing him some old-fashioned southern songs that my father had taught me. (I was born in Louisiana.) They were old Negro songs. He seemed to like them pretty well.

I met a great many other folks. It seems that Mather wanted to collect a lot of celebrities, both state and national, and give them, or arouse in them, an interest in the Park Service.

One time my older son, Alden, and I went on vacation. We had several days, so we took a pack horse and started out hiking up the Merced trail and out over the Sunrise trail, camping where we felt like it and where we could find grazing for the horse. We went up Lake Tenaya and then we went up the Dana Fork of the Tuolumne. We went on up into the Tuolumne Meadows about which Joe Le Conte had lectured when I was a student. Then we went up the Dana Fork of the Tuolumne River, camped there, and then we thought we had better come down and get some new supplies down at the station at Tuolumne Meadows.

Next day we planned to go up the Lyle Fork, but we found when we got to the ranger station at Tuolumne Meadows, a telephone call from Mather down in the valley again, asking that I come down immediately in order to take part in a party that he was showing about the Yosemite.

So instead of going up the Lyle Fork, we put out at once for the valley, camping on the route, leading the old horse. So instead of having a lazy day, we made 14 miles afoot and got down into the valley on Sunday afternoon!

Mather was planning this show for the following day, Monday. He had a great gang together. He had Secretary Fall; he had General Sherman and Harry Chandler of the Los Angeles newspapers; he had Charles Field and Colonel Pickering of the San Francisco papers; the president and the secretary of the San Francisco Chamber of Commerce; Paul Shaup and Mr. McCormick of the Southern Pacific Railway; and bankers and highway commissioners and businessmen and all such men ad infinitum. I don't know how many.

Well, he took eight of those great big green touring cars that the concessionaires own. He took us all around the valley and had lunch out under the trees for the gang. Bryant and I were taken along.

ASKHAM: Was this 1920 also?

MILLER: 1921, it was. After that, we caught the four o'clock control; traffic had to be controlled on the way up. We were taken up to Glacier Point for a banquet, and overnight. We had the banquet and the speech-ifying and speech-ifying and speech-ifying, but Mather got Bryant and me to do most of the talking because he wanted to get people interested in this nature guide work. So Bryant and I held forth for a considerable time.

At Mather's request, I did a talk on the sounds in nature, some of which I was fortunately able to imitate. (By the way, if you want to use that, I think there's a copy of it—I guess there's only one disk that was made by the University, of the sounds. It's known as "Music in Nature." In other words, the elements of sound are utilized in music and the elements in music, like interval, tempo, timbre, and so on, can be used in your study of natural sounds.) Mather wanted me to give them that show, so I did it. And they swallowed it hook, line, and sinker!

ASKHAM: Was anybody along on this trip from the American Society of Natural History? Were they along here?

MILLER: They hadn't been born.

ASKHAM: I mean, the American Museum of Natural History?

MILLER: Not so far as I am aware.

SPEAKING TOUR

MILLER: One outcome of Mather's visits was that he asked Bryant and myself to spend the month of January 1921—following our first Yosemite summer—going about the United States speaking to various groups concerning the National Park Service and the use of nature in recreational and forestry services. I gave 15 talks in 19 days. I got pretty well worn out! One was at Des Moines, Iowa. We began there with a big concourse of parks and naturalists from all over the country, some from Canada, some from New Orleans, some from New York, and some from Iowa, and so on. We spent nearly a week there and I talked myself to pieces!

From Des Moines, we went to Chicago. I spoke at the University of Chicago; by invitation, I spoke to the geology department—that wasn't Mather's job. I also spoke to the

Art Institute. I spoke to an art group in the Art Institute and to a geographical society and talked about music. But they swallowed that hook and sinker also.

One fellow afterwards said, "Well, that lecture of yours without the illustrations would have been fascinating, or the illustrations without the lecture would have been fine, but the combination was something! I've never heard or seen anything like it before." I took that as a great compliment.

Well, we went on to Indianapolis and spoke there; Syracuse, the State Forestry School at Syracuse. Then down to Washington. John C. Merriam of Berkeley had then been called to Washington as head of the Carnegie Institution. He asked me to speak on the geology of Rancho La Brea where I had worked.

I spoke before the Geological Society of Washington. I considered it quite an honor to be invited to speak to that august organization. And they took it fine. One lady afterwards said, "I really didn't know much about what you were talking about, but I liked to hear you talk!" That was a compliment too, I thought. Also we spoke to the Audubon Society of Washington.

Then we went up to New York, the city of New York. We spent several days there. I was fortunate in being able to go down to the headquarters of the American Museum of Natural History and meet some of the people I had not met but had known by reputation.

Then there was a great big banquet at the Waldorf Astoria in New York. Bryant and I were the honored speakers. We put on quite a show there. We had to leave to catch a midnight train all dressed up in our open front suits! When we got up to leave, they applauded us until we got to the door. (Possibly they were glad to get rid of us!) So we got our baggage, which had already been checked; we got our suitcases, at any rate, then took off our open front clothes in an upper berth and packed them away while we were heading for Washington again!

From there, we went on to Buffalo and to Cleveland. We met so many important men, great men, that I can't name them all. Unfortunately, I don't have a record of all their names. By that time, I was very glad to head for home and mother, or my wife, and she met me with open arms.

Now I think probably you've picked my brains about as far as you need to. Are there any other questions you have?

ASKHAM: Well, I have one in particular.

MILLER: Shoot.

ASKHAM: I asked you if you had met anybody from the American Museum of Natural History. In particular, did you meet a man by the name of Frank E. Lutz?

MILLER: No. I didn't meet him. Was he there at my time?

ASKHAM: He was there in New York, somewhere around there, about 1921. In the summer of 1921, he began a nature trail study sponsored by the American Museum of Natural History. He has stated that he was the first to develop a nature trail as such.

MILLER: Maybe he was. I don't know. There is a feeling in my mind that they had such a trail in upper New York when we were at Syracuse, in January 1921.

ASKHAM: He didn't do this until 1925.

MILLER: Oh, that's another matter.

ASKHAM: Then he didn't publish until 1931.

MILLER: I was in Central America then, doing field work and picking up a tertian malaria bug.

ASKHAM: I was wondering if maybe he had picked up some of his ideas from you or if there had been a cross-pollination or something.

MILLER: He may have been in that audience. I don't know.

ASKHAM: He was an entomologist, if I remember correctly.

TEACHING PHILOSOPHY

ASKHAM: Now my question to you is how did you decide this was a worthwhile thing to go into? What were some of your philosophies behind trying to teach people?

MILLER: Well, I grew up under a tree, you might say. (There was a roof between.) I was born of parents in Louisiana, and I inherited from them, my mother particularly, a chromosomal granule of some sort! She used to run around through the big woods with a whole lot of little children and look for pretty stones, possum hawes, sweet gum, this, that, and the other.

ASKHAM: Honey trees?

MILLER: Honey, yes. Anything.

When we came to California, I was 2 and a half years old. The town where we located—Riverside—was a little one-street town 4 miles away. I went to school when I was 5 years old, a mile across, practically, the desert, and from that time on, I was a biologist or a little before.

ASKHAM: You started picking up your biology on the way to school then.

MILLER: Yes. We found little wildflowers and we saw migrating cranes and geese and

we saw shrikes. I remember seeing a lizard's tail—the rest of him was eaten and it was still squirming. It had been pinned on a sharp stub on a willow tree by a shrike.

We just rambled. I remember my first excursion. I was 4 years old, I think. I started chasing a beautiful oriole that was migrating across the desert. He flew from one sage bush to another, and I chased him until my legs gave out and I had to quit. Now that's in my little book, *Lifelong Boyhood*, I think, if you want to read that.

ASKHAM: I will.

MILLER: It's in the library down there. When I went to college, I had already been collecting 6 months in Arizona, collecting birds and mammals and reptiles. While I was in college, I spent the summer of '96, after my sophomore year, in Baja, California, collecting birds and mammals, particularly birds. So I was acquainted with field work and my colleagues—my professors—didn't know field biology. So my major professor and one of the instructors along with two or three graduate students asked me if I would take them up Strawberry Canyon and teach them some natural history!

I began then when I was a student. When I got my first teaching job in Honolulu, I took my students out-of-doors as well as indoors. When I finished at Hawaii, I came back, spent another year at Berkeley, then went to Los Angeles and taught natural history in the State Normal School. The clientele there was largely women—pre-teachers. I learned the first year that the average teaching experience of our graduates was 3 and a half years. After that, they got married or went into some other activity.

I resolved then and there that as long as I was a teacher, I would give them something that they didn't get in the books, that they didn't get in the classroom, that they didn't get from my lectures, but they got *only* out-of-doors. I considered that the indoors was essential, yes. It is to a surgeon, to a medical student. He must dissect; he must use the test tube; he must use the centrifuge. But all of it presumably is to enable him to understand the living organism, even though it's sick. (We hope that it will still be living after he gets through with it and living better!)

So as a teacher, for the rest of my teaching experience, and even when I go to the campus every morning here, I try to give the graduate students I meet there something they can carry away with them—an appreciation of creation, be it living or be it the moon today. I haven't any piece of rock from the moon yet and I don't expect to get any, but I've looked at the moon a good many years, and so have they, and enjoyed it. The world is full of miracles but you have to go outdoors to appreciate it.

In my teaching at the University, I taught a general biology course, and as I spoke to my first class meeting each semester, I said, "You must do at least two things. One is to attend class and keep notes. The other is to go out and see something and bring it in." Well, I got all sorts of things brought in.

ASKHAM: This is at Berkeley?

MILLER: No, at Los Angeles. I did the same thing at Berkeley in summer session. They brought in a leaf or a feather or a cricket or a rock, and some way or other we always got a lesson out of that rock: why was it round? Out of that feather: how did it come to be shed? Or how is a feather built? Out of that leaf: what's its shape? Are there different kinds of shapes? What kind of a tree did it come off of?

In other words, we got facts out of the specimen and (we hoped) stimulated a question left in the mind of the young one—student or kid. After that, I couldn't go out on the campus without somebody coming up to me and saying, "Hey, Mr. Miller, what is this?" So I feel that at least I made a mark on a small percentage of the folks.

Now that was the philosophy. You asked about my philosophy. I used to say, "Teaching is one of the greatest of indoor sports." You are dealing with the highest function—the brain—of one of the most intelligent animals—*Homo*. I considered teaching one of the greatest of indoor sports. My wife once twinkled and said, "Especially when you take it out-of-doors." Now that philosophy has remained with me the rest of my life.

ASKHAM: Very good philosophy.

MILLER: Keep it up. Try it yourself.

ASKHAM: I'm going to. I plan to.

EVALUATION OF NATURE STUDY PROGRAMS

ASKHAM: Would you care to evaluate, looking back in retrospect, on the nature study programs over the years?

MILLER: Every day or two I get a letter from one or another of my former students saying, "I was in your class so-and-so-and-so." How many years ago? One was 50 years ago. She said, "I was in your class 50 years ago, and you taught me something that served me the rest of my life." Now is that an evaluation? Yes.

After we became part of the University, I began one of my lectures in paleontology. (I took a doctor's degree in paleontology.) One of my general lectures in paleontology I began by introducing myself to the students and why I was going to teach this subject. A very husky young lady came up after class, quite bouncy, and said, "Do you remember me, Dr. Miller?" I said, "Well, were you in one of my summer classes?" "No. I was in kindergarten. You took me on your knee and told me a story about nature."

I said, "Well . . ." I didn't know whether she wanted me to repeat it. I did say however, "If you'll attend these lectures, I'll tell you some true stories and maybe you will enjoy them and maybe you'll remember them. Thank you for coming in."

ASKHAM: How do you think the program has done over the years, the nature study programs in the Parks? Do you think it's done very well, is being developed?

MILLER: This letter I showed you came to me just the day before yesterday from the superintendent of Yosemite National Park. He said to me, "The work that you and Bryant started 50 years ago, we are celebrating now its 50th anniversary, and we are crediting you and Bryant with its birth here in Yosemite. From here, it has spread to all national parks and national monuments. The state has taken up the same thing and many state parks have naturalists. Even cities or counties have seen the light and have done just the same thing."

Now to me, that means that it's a worthwhile thing. And instead of having *one* naturalist in Yosemite, I think they have a whole scatterment of naturalists. Bryant and I had to talk about the birds and mammals and reptiles and flowers and sky and trees and cliffs and geology and topography and whatnot. They are doing better now—they are putting in some geologists; they are putting in some botanists; they are putting in entomologists, and so on and so on. Now you ask me: has it been a success? I say, a *big* success.

ASKHAM: What do you think about the programs today? Do you think there's room for changes or advancement?

MILLER: That I don't know, but I know of no educational system that is not capable of improvement if you take into consideration all the changes that are taking place in everything else. Therefore, it's quite proper that we at the University should turn the inspection inward. If we can't adjust in one or another way, we're dead timber.

I don't think that young people, freshmen, sophomores, even seniors, know quite as much as people who have been in the University for several years and people who have been selected by the Regents with advisory committees from the Academic Senate. I don't think that these young fellows who are so vocal are quite as wise as some of the highly selected men and women that are employed by the University.

The same thing occurs in other walks of life. There are cries going up that our young fellows are old enough to be put in the army and made to go to war, why shouldn't they be old enough to vote when they are 16 or 17 or 18? My reply to that: they are put in the army but they are not made generals. They are not even made corporals. If they had the power to vote when they are 16 or 17, would they exert that power as wisely as they would a few years later? I think 21 is about as early as they should be able to vote, personally.

I'm really confident that the government of the United States and the government of the state of California and of Mississippi and of Arizona and whatever—the government on the whole and in general is made up of men and women who are well-meaning and who are fairly well equipped with brains.

So, I raise my hand in salute to the flag of the United States and since we have a Republican President and I'm a Democrat born and bred in the briar patch, I salute the President. If I can do anything to uphold his hand, I will do it as long as he is President.

LA BREA FOSSIL BEDS

INTERVIEWER: G. DAVIDSON WOODARD

MILLER: I have here a copy of a tape which I made for the Library at Berkeley. If you'd like to take that home with you and make a copy of it, I'd be happy to have you do so. They made a duplicate for me and this is my property and if you wish to make a copy of it, you're perfectly welcome. It's not for publication.

WOODARD: Thank you very much, sir. I certainly would like to, if you don't mind entrusting me.

MILLER: Yes, indeed. I don't play it over to myself, naturally. It was taken about two or three years ago when I was 92, I believe, and it's on deposit there at Bancroft Library.

WOODARD: It's also in the Bancroft? That's good to know.

MILLER: Now also I have, and probably you could obtain, copies, tape copies, of my reply to the invitation to come to Los Angeles for

the ground-breaking. You could get that from Ted Downs.

WOODARD: That's right. He mentioned to me the other day when I called him that the museum trustees had a copy of the tape which I had not heard, unfortunately, when I was in Los Angeles. But I do have the copy of the letter that you so kindly wrote on the day on which the new pit was first begun. That I have in my own files.

MILLER: Well, I made a tape recording which was not read at the particular meeting but was read afterwards, I believe. I have that at my desk at Davis here, and a tape which I made in reply to an invitation to come to Ohio and receive an honorary membership in the American Interpretive Biologist Corporation. I could send you those if you'd like to make a copy of them.

WOODARD: Thank you, yes.

MILLER: This is on California. I served three different summers—four different summers—in the Federal Parks Department as ranger naturalist, interpreting the biology, geology, topography, and so on, of Yosemite and of Crater Lake, both of them here in the West. That was 1926 and '27, in Crater Lake.

I was therefore elected an honorary member and given that diploma from this organization, so if you wish something of that sort, I would be happy to send it to you.

WOODARD: Oh, thank you very much. Again, I appreciate anything of this nature.

EARLY UNIVERSITY OF CALIFORNIA EXCAVATIONS

MILLER: Now, what can I do for you particularly while you are visiting here?

WOODARD: Well, Dr. Miller, what I am particularly interested in, especially in my own interests presently, is a reconstruction of the geological conditions which were prevalent when the La Brea Pits were formed, and what I would really be very interested in, right at the beginning perhaps, would be if you can give me some recollections of what just the surface of the general Hancock Park area looked like in your memory, perhaps even before the excavations were begun.

This would perhaps apply particularly to the area of the University of Califonia pits which, of course, were located in the northwestern corner of the park and where current excavation is taking place right now. Really, I sort of think anything that you have in memory about the area, the processes of digging, and what you can remember they may have discovered in terms of the sediments, would interest me very greatly.

MILLER: Well, I have on record on those tapes which you have a copy of, my first visit out there in 1906, and I have also a photograph or two which I took personally in the area at that early date. Of course, it was far out in the country. Now it is right in the center of the city. I would be happy to lend you negatives of those pictures and you may have copies made of them.

WOODARD: This we would appreciate very greatly. The only photos, really, that we have were those made . . . well, there are a couple of photos still at Berkeley that were taken when Reginald Stoner was in charge of the digging. But of course, these are directly into the pits themselves, and unfortunately it doesn't show what I am interested in as much as anything, which is the panoramic view of the area.

MILLER: Well, I have, as I say, two or three pictures of the general area but they are not highly valuable for geologic purposes, except to show that it was open terrain and that these masses, or lenses, of asphalt were simply slightly elevated because the native soil had been washed or blown away somewhat. The asphalt remained resistant and appeared as slight elevations.

In one of these mounds, the first excavations were done by Dr. John C. Merriam away back in 1906. Now his *memoir*, which is in the paleontology library at Berkeley, gives you something of that. It may have pictures. I do not know.

WOODARD: Yes. It does have two or three pictures that were taken mainly down near the Hancock House where the big lake is now. And he does show one very interesting picture which does appear to show some stratification in the uppermost soil layers just below the top surface of the asphalt capping.

DISCOVERY OF PLEISTOCENE BONES

WOODARD: Now, could I ask one thing, Dr. Miller. Do you have any recollections as to whether there were any quite high concentrations of bone in the surface asphalt deposit right on the surface, or do you think that this was more just a pure . . .

MILLER: Oh, it was quite concentrated because these lenses were composed of asphalt from Pleistocene times. When I first began collecting there in late 1906 and early '07—that is, December and January—I took an ordinary miner's pick and started at the surface of one of these lenses. And the second or third blow of my pick displayed bones of Pleistocene mammals.

WOODARD: They were right at the surface?

MILLER: Right at the surface. And where they had been exposed before I had struck with my pick, the weather had leached away the dark bituminous material, leaving the bone bleached almost as white as that paper.

WOODARD: Really? They were bleached out almost like recent bone in the material.

MILLER: So you could see them in the lens. That's why I picked out a certain area to begin digging. And, as I say, with the second or third blow, I brought up bone that was Pleistocene. So there was no stratification.

WOODARD: In the topmost layers! It was just a mass of material all gathered together!

MILLER: Some of the photographs that Stoner and Merriam took show a concentration of bones in the lenses.

WOODARD: Do you remember whether the bones were more or less distributed throughout the complete lens, or would they tend to occur in small pockets within the lens itself?

MILLER: The small, more fragile bones, like birds and small rodents, were preserved in the borders because there was less differential motion by the movements of the tar, slow though it might be. It was like a boiling, a very slow upward movement.

WOODARD: Turning over of material . . .

MILLER: Due to gas and oil and outward movement due to the upward pressure shoving these materials aside. So that I used to tell my students, "It was a gigantic, boiling kettle, although the bubbles came minutes or hours or days apart."

WOODARD: They just appeared and then burst and faded away.

MILLER: Geologically, the time was small, but with the clock it was long.

WOODARD: This would more or less imply then—this is one thing that interests me very greatly—whether the surface (neglecting of course the hardened asphalt but in some of the other exposures) whether the surface deposits are actually of what I would call a liquid bitumen, or was this a more pasty, viscous mixture?

MILLER: There was always a series of what you might call "veins" or "channels"—microchannels—up through the lenses, and as I tell in my little book, in the chapter on the Rancho La Brea, bubbles of gas would come up through these channels with a *hchrusssssh*, and little bits of perfectly fresh, heavy, crude oil would come up through these same channels.

So the Pleistocene asphalt was like a modern cheese, but the fresh oil coming up made my shoes and my clothing, and sometimes me, a sticky mess, more or less. I changed my clothes as soon as I got out there and before starting to work. That is indicated in my little book too.

WOODARD: Yes. Did you ride a streetcar that went past three-quarters of a mile away, and then you had to walk?

MILLER: We got off at a little crossing which was merely a signboard. I've been trying of later years to locate that signboard and that area, but the city has grown up around it. The car lines have been torn up because of transportation by automobile. The little crossing was merely a stop known as "Rosemary." That's for remembrance. We got off at Rosemary station and the car went whizzing on by. They went at a tremendous pace clear down to the beach.

WOODARD: This was on Wilshire Boulevard, I suppose?

MILLER: It was south of Wilshire. Wilshire Boulevard was nonexistent at that time. Beyond Vermont Avenue, it was all grain fields, and the city hadn't developed beyond Vermont Avenue.

WOODARD: Vermont Avenue was almost the western limits then.

MILLER: Practically the western limit.

WOODARD: Yes, it's marked north and south. It's rather hard to believe, in this day and age when it's all covered with houses.

MILLER: And as I repeatedly have said, I've tried since then to locate Rosemary. The cars have disappeared, the signboard's disappeared, and the terrain is all covered with houses, buildings. One day I remember, as I walked through grain fields (we just made a little path through the field to and from the station), I was walking through there and I heard *hchrusssssh* down in the grass, and there was a tiny little vent with bubbles of gas that came up. Now, somewhere in somebody's basement today, there's doubtless one of those oil-seepage vents, possibly a sabre-tooth further down.

GEOLOGY OF THE AREA

WOODARD: Yes. This is one of the things that we have found—I've personally found—quite interesting, that the tar beds in which the Pleistocene mammals are entrapped exist, of course, as far west as Fairfax, and probably as far southeast as perhaps the intersection of La Brea and 10th Street or 12th Street. Rancho La Brea is just at one fortunate locality where it's completely surrounded by the city.

MILLER: Yes, but as I remember, we explored north and east trying to find additional fossiliferous lenses. We found some lenses, but none of them were fossiliferous.

WOODARD: No; perhaps I might make a comment here. One of the things which we are finding now is a good possibility that the so-called "6th Street Fault" may surface at the erosion surface between the Pliocene and the Pleistocene almost directly below the northwest, southeast alignment of the old major pits —the University pits, 61, 67, pit 4, and pit 3. And one of the suggestions that I think is quite possible is that the tar supply—or I should say, the bitumen supply—coming into the pits, of course, was directly related to the escape of asphalt-bearing oil along the 6th Street Fault.

MILLER: Might be.

WOODARD: Now, I have also been interested by the fact when one goes north of 6th Street —and that is in the area which is now occupied by Park La Brea, but of course used to be the old Salt Lakes Oil Field—the uppermost 40 to 60 feet of sediments contain essentially no flat-line layers of tar whatsoever. It seems that the geology is quite different immediately north of La Brea than it is immediately in the vicinity of where the fossils are being preserved.

MILLER: It seems to be the case.

WOODARD: You seem to have recorded the same thing when you were looking 60 years ago. Very interesting.

You are probably conversant with pit 3 which was the Los Angeles County Museum pit that had the classical ice cream cone-shaped structure, and in the present day, it would have been about a hundred yards southeast of the University pit.

In the records of the L. A. Museum that were kept by Wyman at the time of their digging, interestingly, he recorded at the depths of 12 feet, the point at which the old tree was imbedded in the soil; and in my studies, I have been able to show that this surface in which the tree was imbedded was actually a surface which extends all the way over La Brea, of course, submerged underneath the ground at the present time. One of the interesting things is that in replotting of the subsurface contours from the top of that bed, I find very strong evidence that the deep stream channels running from the northeast of the park—northwest of the park, excuse—to the southeast and then joined by another stream coming from the northeast of the park running from the southwest . . .

MILLER: *Rodeo de las aguas*—the old Spanish term—the meeting of the waters. *Rodeo*: the meeting or the gathering; *de las aguas*: of the waters. That was the original name of the old Spanish *rancho*, part of which was sold to Major Hancock and called by him *Rancho de la Brea*—the Ranch of the Tar. *Bitumen*: *brea*, in Spanish.

WOODARD: Yes. I always wondered whether there wasn't a possibility that there may have been some surface indications of a drainage pattern.

MILLER: In my letter—which you read, I think—I spoke of bedded leaves. I didn't save them, unfortunately. I was a zoologist, and in a hurry. Sandy beds with bits of wood, somewhat worn by stream action, chips of wood and leaf beds—those occurred while I was digging out bones.

WOODARD: You found those directly again associated with the bones?

MILLER: Well, not far from them. I didn't dig very extensively. I had only my own pair of hands.

WOODARD: Yes. I can fully imagine how hard that digging was.

MILLER: I dug where I found material to dig for. Yet I found there those evidences of stream action.

COMPLEX ORIGINS OF PITS

WOODARD: Yes. Well, this is another thing which does interest me because I feel rather convinced, I think perhaps in some ways that some of the . . . first I should say, that I think the pits have a very complex origin. I don't think there's any one single answer to any of them.

MILLER: Some of them older and some younger.

WOODARD: Some are old and some are young. Some are possibly still forming, if one might put it this way.

MILLER: Some little pits like that had ground squirrels and meadow larks trapped in them, lizards maybe, but none of the ancient fauna, some of the little lenses no bigger than a pail, a bucket.

WOODARD: Yes. And this, of course, is one thing we are finding, again reaffirming the earlier excavations. In this respect, I wonder if you might comment on pit 10, which of course was the pit with the human skeleton. Incidentally, you might be interested to know that the radio carbon dating has now been done on pit 10 and the Indian lady is nine thousand years old. This has not been published; I just heard it in Los Angeles. This, of course, makes this somewhat younger than we have always suspected, younger than the major pits. But you commented yourself very early, that you felt that the associated fauna in

pit 10 was somewhat younger than the typical La Brean fauna.

MILLER: I have a perfectly clear recollection of being out there with John Campbell Merriam and Henry Fairfield Osborne of New York and the director of the museum at that time, Frank S. Daggett. When the human remains were discovered in pit 10, I remember seeing Merriam go down into the pit and examine the walls very carefully, and *I watched* him very carefully.

The walls of the pit showed ancient asphalt of a brownish tone in color, containing also mammals. The central core of later, much more recent as we interpreted it then, more recent asphalt constituting a fill-in of a chimney, you might say, a chimney some feet in diameter—I don't remember how many. In that chimney there were none of the ancient fauna present.

We did find, I think it was, one bone of the great *Teratornis*, but my feeling was that bone had perhaps crumbled in from the walls of the pit nine thousands years ago. The *Teratornis*, unfortunately, was not carbon dated, that particular one.

WOODARD: That has not been dated yet but it could be.

MILLER: I think it should be. My son Alden and Hildegarde Howard later made a very careful study of the notes that Wyman kept, and they felt that I had the wrong idea, that it was a chimney. I still cleave to my thought because I was there. And I saw it, and I saw Merriam look at that wall with greatest care. And Obsorne and I both stood up on the bank watching. Osborne took that human skull and turned it over and over in his hands and said, "It's a perfectly good Indian. There's nothing primitive about it."

WOODARD: So *he* knew it was much later too.

MILLER: Absolutely.

WOODARD: Have you ever entertained the thought or the possibility that the Indians themselves may have excavated the tar back, let us say, as early as nine thousand years? It would have seemed logical to me that the Indians would have used some of the La Brea deposits as long as they have ever lived in the Los Angeles basin, and I've always wondered perhaps whether the poor lady just died while she was digging *brea*, and that thereafter the Indians wouldn't go near the pit and that this accounts for the possible occurrence. Nobody's ever explained the presence, of course.

MILLER: I suggest in my little book that maybe she was a witch and they put her in there.

WOODARD: That's always a possibility too. I guess we'll never really know.

Well, this again, of course, has strongly influenced our thinking that in view also of the artifacts in pit 61 and pit 67 which are terribly complicated pits, very hard to unravel, even from Wyman's notes—it's almost impossible to see what was going on in there—but there seems no doubt that the pits themselves have shown various kinds of activity and then ceased and then sedimentation has occurred and then the pits have begun once again, and animals have been trapped in them.

HISTORICAL INCIDENCE OF ASPHALT

MILLER: The pre-Columbian Indians of California, southern California, used asphalt a great deal. But they didn't have to go to Rancho La Brea to get it because it was continually being washed up on the beach of southern California.

WOODARD: That's true.

MILLER: I remember as a little boy, away back in the Eighties, early Eighties, going from our home in Riverside with the family down to the beach at Laguna and finding globs of crude oil thrown up on the beach. I have out there in the garden an Indian grinding stone made of granite or something of the sort with a channel chipped around to form a groove in the upper surface, and when I first got the stone there were bits of asphalt still adherent in this channel. In other words, the Indians made a basketry ring attached with asphalt in the groove around that grinding stone so as to keep the seeds from being thrown out. And they could pound away down in there and get the materials ground up to the consistency they wished. Now that asphalt which they used may have come from Rancho La Brea, or it may have come from Santa Barbara because it occurs all the way up the coast.

WOODARD: There's quite a bit of oil that one might say "polluted" the beaches even that early.

MILLER: Indeed yes. And we kids used to get it on our feet when we'd go bathing, and even my own children did later on. Mother would have to take kerosene and wash off their feet when they came back from swimming.

WOODARD: Yes. I can remember the same thing as a child also, but I think ours was from dirty ships, but of course in those days there were no ships in great abundance to do this.

MILLER: One year as I came home from college—we used to go to Berkeley by steamer from southern California—I was coming south one very quiet trip and I came out on deck in the Santa Barbara Channel headed south. As the sun rose, the whole surface of the sea was irridescent from a thin film of oil on the surface.

I said to the old first mate who was a German, "Where's all this oil coming from?" He said, "Mein Gott! If I knowed that, I don't go to sea no more!"

WOODARD: He's anticipating a lot of things that happened later on in history.

MILLER: Sixty years later that whole area . . . Well, in 1904 I was doing oceanographic work offshore from the Mexican border up the coast to Point Conception, and out 200, 300 miles. 1904—didn't I send you a copy of that paper?

WOODARD: Yes.

MILLER: Now, we hauled up by a dredge haul, at 2100 fathoms, 6 foot to the fathom, masses of hard asphalt. I opened and burned one with a smoky flame.

WOODARD: So there's a great deal of oil that's escaping out on the ocean floor at great depths. Very few people I'm sure know about that. That's the first that I've ever heard of oil seepage that far offshore at that great a depth. Again, that interests me very greatly.

Do you think that this affects the sea life on the ocean bottom very greatly?

MILLER: I don't think so. Nothing comparable to the DDT that they have now!

WOODARD: That's one of the other things that we've got to start combating soon too. I suppose that not all problems have existed for all times, put it that way. We've introduced a few in the last 40 years.

MILLER: And you as a geologist know very well that nature does not stand still.

WOODARD: Not at all. Not at all. Every mistake that we make, she counterplays with at least two that are twice as drastic.

SPECIMENS IN THE STUDY

WOODARD: Now as an avian paleontologist I never got off the ground floor, but this is a *Teratornis* or [handling specimens] . . . ?

MILLER: No, that is my first bird described from Rancho La Brea and the second bird described from the state of California—fossil bird, that is. That is the California turkey. *Teratornis* I described in 1910, I believe. This I described in '09. *Teratornis* may have been in late '09 or early 1910. That turkey bone is the one I took out of the asphalt and jumped up and yelled to the surrounding meadowlarks, "There is *Gallus californicus*!"

WOODARD: Was that the one that you renamed later on?

MILLER: Yes—*Parapao.*

WOODARD: *Parapao*—that's right. Yes. Beautiful specimen.

MILLER: Isn't it? Perfect.

WOODARD: Looks like the living bird.

MILLER: Just as good! But we don't have anything like it living at the present time in California.

WOODARD: How big a bird would this have been?

MILLER: Oh, as big as our modern turkey.

WOODARD: Modern turkey size.

MILLER: Approximately. Of course, our modern turkey has been cultivated, crossed, and selected and this, that, and the other, until you get big turkeys and little turkeys and white turkeys and brown turkeys and all sorts of turkeys.

WOODARD: And none of them taste as good as this one would have.

MILLER: Not to me! Not to me!

WOODARD: This one here has a very strong spur.

MILLER: Yes indeed. That was, of course, covered with a horny covering, or keratin.

WOODARD: Is this almost identical, again, to the modern equivalents? Or have they evolved very much?

MILLER: Oh, not evolved, they're just different—minor differences.

WOODARD: I notice that you have another big bone there.

MILLER: This is a recent one. It is a condor.

WOODARD: Oh, this is a California Condor?

MILLER: I don't know. It came from a sailor's kit. It was given to me. Whether it's from South America or North America, I know not. I think it's a North American condor. I keep it because it has beautiful curves, beautiful topography. I was showing it to an art major, a visitor from Boston, and he just loved it, so much I nearly had to shoot him in the leg to keep him from running away with it.

WOODARD: I must admit that I started out my career, of course, as a geologist and then met Dr. Stirton when he came to Australia in 1953 and I had never thought of fossil bones. Fossil mammals were almost completely unknown in Australia until his trip except a few Pleistocene occurrences. We sat and dug diprotodons to begin with and then we got, of course, the first Tertiary record of bones back in 1953.

That is why I came to Cal. I ended up taking all of the courses in vertebrate paleontology. I'm afraid geology has always been my first love—or shall I say, my security—and I've stuck with it more than anything else.

MILLER: You took your degree at Berkeley?

WOODARD: Yes. I took my degree in the Paleontology Department actually, and my thesis work was done on a project with Ted Downes, or actually through the L. A. Museum in the Salton Sea area. We have a tremendous Pleistocene, late Pliocene fauna down in there.

I might just mention that I found the beak of a bird which is probably somewhere within the late Pliocene Age, that Ted tentatively identified as a *Teratornis*, but of all things, it's much bigger than the *Teratornis* that comes from the Pleistocene.

MILLER: It may be been *Teratornis incredibilis*.

WOODARD: Yes. This we do have higher up in the section.

MILLER: You found it in the Salton Basin?

WOODARD: Yes.

MILLER: Has Hildegard seen it?

WOODARD: Yes. She wrote a small paper in the Los Angeles County Museum contributions on some of the birds. You probably have a copy of this, I'm sure. She has seen the beak of the thing which we think is considerably lower in the section and hence much older, but I don't believe anything has been done on this yet. The beak is about this long and about this deep. We just have the frontal portion of the snout on the beak.

MILLER: That's the first part of *Teratornis* that you found in 1909—the beak?

WOODARD: Yes. I must admit that when I first found it I thought it was a claw of a ground sloth. I'm a little "out" on my paleontology these days. I haven't worked with it enough, unfortunately.

MEMORIES AND PHOTOS

WOODARD: When you were at the University of California—and, of course, you remember the University at a very early age. Would you like to just recount to me some of the memories you have of the University? I'm very interested in how much it has changed. All of the information is on this additional tape, because this I would like to compare very much with what goes on in the present day.

MILLER: Berkeley. Let's see. I went there in 1894 as a freshman. We had 1200 students. We didn't know what to do with them.

WOODARD: Unbelievable!

MILLER: Same thing today. That's all on your tape.

WOODARD: That's all there? Very good.

We might perhaps come back to Rancho La Brea again for a very few minutes, to the University pits which I know that you are fully familiar with. In reference to Reginald Stoner's paper, he showed quite a regular form of topography in the three. As I remember, in pit 2052, which was the second of the pits, it turned out that the deposition occurred within three separate pockets. I should have brought his publication with me; unfortunately, it was back in the Bulletins of the University of California early in the 1900's—1912, '13. But I was wondering how you feel about this. Dr. Merriam's first excavation was on the south side of the lake as it now is found.

MILLER: Yes, on the south side of the lake. That's the one he showed me in 1906. And that's where I picked up the vertebra to take home.

WOODARD: And took home—the vertebra of a saber tooth!

MILLER: That's in my letter.

WOODARD: This has always been a very interesting area. It's alway given good indications, as if there should be good localities, and yet in all of the museum excavations, they never really got any good return from it.

MILLER: No. That area was almost cleaned out of bone, and the excavations that the University made later were about 200 or 300 yards to the north and west.

WOODARD: Yes. Dr. Miller, do you happen to remember if there was a big fig tree that grew near the house?

MILLER: I don't remember a big fig tree, but it might be there.

WOODARD: There was one other thing. In one of Dr. Stock's references, he refers to the hot house, or the plant house. Now I presume that they must have had a conservatory associated with the house. It doesn't show up on any of the old maps.

MILLER: No, I do not remember. There was a grain shed and a harness room. I used to go in there and change my clothes.

WOODARD: If I remember, that would have been slightly to the northeast of the house.

MILLER: Yes, northeast of the house. Now there were several Grevillea trees, Australian *Grevillea robusta* that Major Hancock had planted years before. They still persisted, but I do not recall a fig.

WOODARD: There were just two localities referred to, a fig tree and a plant hot house. Some of the localities are referred to—a hedge

that grew around the house, or to a fence around the old Hancock house. Do you remember if the fence or the hedge were very close to the house or . . . ?

MILLER: I do not recall that, I'm sorry to say.

WOODARD: Dr. Howard fortunately was able to fill in one critical locality which was the old bear restoration. Dr. Stock gave almost 30 of his localities in relationship to the old bear restoration, but of course, the bear was moved many times. We think we have the locality.

It almost looks in this photo as if this was a hedge on the north side of the house.

MILLER: It would be the east side of the house, looking almost west. Way off down this way was where they ultimately did their greatest degree of excavation. John C. Merriam made his first excavation right about here. Now it looks like, almost, the shadow of two trees there. Those are eucalyptus.

WOODARD: Do you recollect, was this a road? That land behind the lake?

MILLER: No. No road at all. That was sort of an embankment and the Los Angeles High School did some cutting along there, and later the county museum did somewhat. But most of this excavation was done, as I understand it, by Major Hancock getting out commercial asphalt. That commercial asphalt, some of it, was shipped clear up to San Francisco and used in the covering of sidewalks. I recall as a student going over to the city one day on a very hot day, and the sidewalk was squidgy because the asphalt had been softened up from the heat.

This is a copy of my little book which the librarian at Los Angeles tore apart and inserted photographs.

WOODARD: Do you mind if I have a look at it?

MILLER: No. I was going to show you. Here is a negative of John C. Merriam taken much later.

WOODARD: Yes, this is the note on the date.

MILLER: Yes, I put that in much later.

WOODARD: Yes. The dates of course which are coming out now are really fascinating. That is a beautiful photo. That's lovely. [Looks at photo of Miller and infant son] I've just married quite late in life and we have a little girl who is just one year old this week, and she's the apple of Dad's eye, needless to say.

MILLER: Naturally. That's how old I am there. I married rather late in life. I was 27.

WOODARD: I hate to own that I was 40.

MILLER: Oh, you're worse than I am.

WOODARD: The John Day Basin is really quite a fascinating spot, isn't it, geologically?

MILLER: Perfectly fascinating, and that's recounted in my little book. I kept the only diary that I know of in existence at the present. It was just a running diary, not a scientific notebook, but I filed that diary with the Bancroft Library, and they gave me a typescript copy. Now just this spring the director of the museum at the University of Oregon asked my permission to reproduce that diary *verbatim*—away back in '99. And he said he hoped to have it out this fall. It hasn't come.

WOODARD: It hasn't been completed yet. But this is the University of Oregon Press that will be putting this out? How nice. Well, I hope they have it out in time for your birthday. It would be rather good of them if they timed it so well.

MILLER: I'm tired of these birthdays. They are getting monotonous.

WOODARD: I think that one should forget about them after 21. I told my wife this. She's much younger than I am.

Now *this* was taken at the park, wasn't it? I wonder if this wasn't the covering that was put up about the University pit.

MILLER: Isn't that on the back?

WOODARD: Oh, it is. Yes. 1912. U.C. Paleo was working on a spot under the canvas awning.

MILLER: I'm standing there talking. I'm the figure farthest to your right, and there's another gentlemen standing. That is the president of the school where I was teaching, and then there are some students farther to the right and I'm explaining to them what is going on. The negative from which that's printed is also in the envelope.

WOODARD: It really *was* out in the country, wasn't it?

MILLER: Oh, mercy, that was 1912 and we had to drive out there then.

WOODARD: There actually was quite an extensive surface growth of scrubby vegetation in the picture.

MILLER: Oh yes. Various grasses. Of course, it had been grazed off and cleared more or less.

WOODARD: None of the original oaks or anything were ever left standing? I suppose they had gone with agriculture.

MILLER: Yes. Old Major Hancock used it for raising grain. That is a picture taken in 1914 or some such time, and the names are there.

WOODARD: Yes. You're talking to Mrs. Osborne and Mr. Daggett and Professor Osborne.

MILLER: Now that is a copy of the print which was given me and I placed it with the library in Berkeley at Bancroft, but they have copies of it undoubtedly at the Los Angeles Museum.

WOODARD: I think I may have seen the copies of these in there in the small photo file. I again remember asking especially whether the building in the background was part of the old Hancock house. I was interested in the trees that were growing around, trying to pick up clues again as to where some of the later test holes of Chester Stocks had been put in.

MILLER: There were some Monterey cypress, I remember; there were some eucalyptus. There was much cactus, tuna cactus, which the Mexicans used for food in the early days. Now, in that picture the buildings in the background were the grain shed and the harness room, not the residence itself. And these were eucalyptus trees, young trees.

WOODARD: It doesn't quite look like the house.

MILLER: No, I'm quite positive as to that. He used to store the grain in bins, wooden bins. The building itself was mostly gone to pieces but those bins with the fine cracks all closed up with boarding kept the grain from going to waste and kept the mice out. I used to keep my clothing in there.

WOODARD: I'll be darned. And then come out and get your pick on Saturdays or whenever you could get out into the pits for digging. How deeply did you dig the pit when you were working by yourself?

MILLER: I only got down about 8 feet. But after I ran out of muscle, the University took over right where I left off and that was their major excavation.

WOODARD: That became number 2052, I guess.

MILLER: I think so. Something of that general nature.

WOODARD: They changed the numbers on them at one point, but I think that that was their big excavation.

MILLER: But that's the picture with the canvas. That's where I began and that's where I struck fossil with the second stroke of my pick.

WOODARD: Within this far of the surface?

MILLER: And that's where there were exposed bones bleached white by the weather.

WOODARD: One of the things which has interested me is that Dr. Merriam in his monograph seems to think that a great deal of surface erosion had taken place at Rancho La Brea with much of the Pleistocene soil removed, and I tend to disagree with this. I think the recent oil stream, or oil creep, that passes through has been responsible for possibly moving 18 inches to 2 feet of material that has been eroded off since the pits accumulated. But I've always felt—and geological information seems to indicate that this is true also—that the pits with their asphalt cappings were very close to the old topography as it is today.

MILLER: I feel the same way. I do not feel that there has been a great deal of surface erosion subsequent to the exposure of the asphalt. Nowadays we have occasionally periods of high degree of rainfall—fluvial times, even cycles of such. In my boyhood and manhood, I've seen every 6 or 8 years a period of high degree of rainfall and then would come a period of less rainfall. In my boyhood experience, I saw the river which was near my old home change its course by a mile, due to high degree of erosion subsequent to heavy rainfalls.

WOODARD: Yes, I think this is one thing we tend not to remember, how changes take place either sometimes very slowly or else they can sometimes take place very quickly. This was brought to my attention the other day when I was looking at the Russian River and the farmer that I was talking to had lived there since the turn of the century. He was saying that when *his* father lived there, they used to almost fish from the house into the river but the river is now almost gone.

MILLER: Like the old Missouri River and the Mississippi. "River, stay away from my door!"

CHANGE IN WILD LIFE OF CALIFORNIA, 1877–1960

INTERVIEWER: JOHN B. COWAN

COWAN: I am sitting at the residence of Dr. Loye Miller, Professor Emeritus at the University of California, and we are here in Davis, California. Dr. Miller has consented to talk to me and chat very informally about things that relate to early California wildlife history. Dr. Miller is so well known and so distinguished that he really needs no introduction, and I will not try to make one at this time, other than to start a conversation with him.

Dr. Miller, first let's talk about some of your early boyhood days since right today you are 93 years. That is a very distinguished age and

certainly what you have to say will be of interest not only to me but many other people.

What would you say were some of the things relating to wildlife that were of interest in your younger days?

MILLER: Well, first I came to southern California, Riverside, when I was 2 and a half years old, and Riverside was pretty nearly the same age. It was a desert and, too, it was just being transformed from a desert area into a modern city which is now today largely a tourist attraction. But I came there, and we lived out *in* the desert practically. The desert was at our door.

I have lived in California then almost continually for 90 years, and I have been interested in the out-of-doors for all of that time, not only as a teacher in my later years, but as a youngster in my earlier years. At Riverside, I have seen quite positive changes.

I recall not long ago reading in an early Riverside paper—they published a paper as far back as 1871—an item there spoke of the prong-horned antelope being seen from the center of town out on what is now the campus of the University of California at Riverside. That was before I arrived.

When I was a boy, some of my grown-up neighbors went hunting in the San Jacinto Mountains which lie to the east of Riverside. They were hunting deer. While there, they came across the tracks of a very large bear which could be none other than the southern grizzly bear.

COWAN: This must have been in the early 1880's, would you say?

MILLER: In the early 1880's or the late '70's. I think the early 80's. They folded up their rifles and came away. They didn't want to meet a bear that size with a deer rifle. Of course, I didn't meet him either.

I also recall as a boy being interested in the out-of-doors and interested in birds and bird eggs, and I recall a statement that some young fellows in San Bernardino, which was about 12 or 14 miles northeast of Riverside, had found and collected the eggs of the California Condor in the San Bernardino Mountains. I never even saw a California Condor until I was a grown up biologist and a teacher in Los Angeles.

COWAN: This was probably in 1880, would you say?

MILLER: Yes, the Condor eggs were taken then.

My father came the year before in 1876 and found a place to live, then sent for the family in Louisiana, and we came in the spring of 1877. Father used to tell us stories how there were geese and ducks all over the country. There had been rather heavy rains and there were ponds of water from the rains. He said he went duck hunting and goose hunting, and he killed so many he couldn't eat them all. He tried making jerky out of ducks and geese but it didn't work.

COWAN: This would have been in the San Bernardino Valley area?

MILLER: The great valley from San Bernardino southward to what is now Corona. The Santa Ana River Valley. It was known first as San Bernardino and now as the great —I guess you would call it the Santa Ana River Valley. There were also in my childhood plenty of ducks and geese in this river bottom only a mile and a half from our home, which was up on the beach in the sagebrush country. I remember also reading of market duck hunters going to what they then called Gospel Swamp, an undrained swampy area which was fed by waters from the San Gabriel River, the river coming from the San Gabriel Mountains. This Gospel Swamp was furnished with waters from the San Gabriel and the Los Angeles Rivers which drained off in that direction.

The market hunters went there to shoot ducks and geese. The bodies of those birds were a complete waste. They took only the feathers. So market hunting at that early date was for the accumulation of feathers for mattresses and pillows, I judge. Now the location of Gospel Swamp was down in Orange County, somewhere near the present city of Anaheim. It was named Gospel Swamp because a group of religious-minded folks started a colony down there, but it did not last.

Again, around Riverside as a boy I recall great numbers of Sandhill Cranes, thousands of them, migrating in the spring in great, great flocks and sometimes they would alight in the hills near us where the wild grass, particularly the burr clover and alfieria, was springing up. They would alight there and graze like sheep. But particularly I recall as a little boy of 4 or 5 years old watching them migrating in great numbers. There were also large white birds which we boys called white cranes. They were in flocks and we used to go out and scare them up from the rainwater ponds, and they would alight in some bushes nearby. I think of them now as no other possibility but the woodstork or the so-called Wood Ibis that is known in southern California today.

COWAN: This was near Riverside where you were a boy?

MILLER: Yes, right within walking distance for very small boys. There were also great numbers of California quail. When I was about 7 or 8, perhaps in the early 80's or late 70's, our neighbors, the grown-ups, and my father and mother used to go down to what was known as Temescal, a station on the old Butterfield stage route from the east through to Los Angeles. It was at the eastern foot of the present known Santa Ana Mountains. We used to go there and camp in the fall and hunt quail and doves. There were literally thousands of quail. I recall out on a brushy hillside seeing a flock that couldn't have been less than 400 or 500 in one flock, it seemed to my small excited imagination. I went along as retriever for one of our neighbors and the moment a bunch of quail would fly up, I would drop down so that he could shoot over my head, then I'd go and hunt the birds.

The changes that took place then with the advent of water and the growth of vegetation gave us expanses of alfalfa which were more or less artificial meadows, and meadowlarks came in by the hundreds. There were Marsh Hawks which flew above and over these artificial meadows. The fruits that were produced sooner or later, before oranges were predominate, brought in linnets, grosbeaks, and ultimately jays.

I remember the first Black-headed Grosbeaks and the first phainopeplas and jays that came into the one-time desert. I had seen jays at Temescal flashing through the oak timber of that age. Now I later found them coming into Riverside. As our fields were plowed or irrigated or grown up to vegetation, the desert horned larks which used to be right in our door yard had to move out. They moved back above the artery, the great aorta, the canal that brought the water.

Other changes have gone on in Riverside since 1894 when I left to go to college and visited only occasionally coming back. Those are some of the experiences I had in my childhood.

COWAN: Well, then you went to the Bay Area, didn't you? You went to the University of California at Berkeley.

MILLER: I went to Berkeley as a freshman in 1894. I think I may have said to you once before, going over to the City, San Francisco, I would see standing on the corners on Market Street men with great strings of game birds for sale. That was in the early 90's, and I recall a very small white goose, no bigger than a duck practically which they were offering then for 24 cents a brace. They could be nothing but Ross's Goose. I knew the big white Snow Geese. These were Ross's Goose.

COWAN: You mean 25 cents a brace.

MILLER: For two—12 and a half cents each.

COWAN: Did you ever observe this in the Los Angeles area, market hunting of this same type?

MILLER: Yes. After I graduated and taught for a while in Hawaii, I moved to Los Angeles in 1904, and I then began collecting specimens of various sorts, both skins and skeletons for my research and for my teaching. There was a market on Third Street in downtown Los Angeles which sold game, any kind of game you could get. I purchased there a great variety of ducks: Mallard, Redhead, Canvasback and several others. I purchased geese, Ross's Goose; I wanted both the skeleton and skin. Those skins and skeletons are in collections in Los Angeles today. I also purchased my first specimen of the Bandtailed Pigeon which I needed. So at that time, game was marketed in Los Angeles. There seemed to be no objection on anybody's part.

COWAN: Now this was in the 1890's or early 1900's?

MILLER: From 1904 until 1910 or 1912. I went to Los Angeles in 1904 and began teaching.

You were interested in my observations of certain epidemics which affected the populations of southern California. I recall as a very small boy way back in the 80's, they used to have what they called rabbit drives in the San Joaquin Valley. I didn't see them but they were reported in the daily papers. Around Riverside, we did not have an excess of jackrabbits, but I went out on the Mojave Desert near the present town of Victorville in 1908 in the summer and in 1909 the following summer, there was a jackrabbit under practically every bush. And I noticed that those animals had lumps here, there, and yonder over their bodies. One or two had been shot and I found a blister-like enlargement, subcutaneous, and they were commonly called blister worm.

I have no notion what they were; I was not a pathologist. The following year, 1910, the rabbits were practically wiped out and I saw almost no jackrabbits, but there were dried up carcasses lying around all over the desert.

In 1909, some disease, I know not what, affected the coyotes. Now the coyotes, of course, feed on the jackrabbits, but I do not know that it was the same virus or worm or what you

call it, that affected the coyotes; but in 1909 you could hardly find a coyote with a good pellage on it. There were some sort of scabies or some disease that made them almost as bare as a Chihuahua pup. I killed one or two and saved the skulls and they just looked like rubber coyotes almost. The local population said it was due to the alkali water in the river, but the water in the river was perfectly splendid. I drank it myself.

Another case of some disease affected the big horn sheep in the desert of Riverside and San Bernardino County. I was out there in 1928 in what are known as the Santa Rose Mountains and eastern San Jacintos. At one area where I camped, I found the remains of eight or nine different sheep, adult, juvenile, male, and females, some of them aggregated around a waterhole in the bottom of a very sharply banked ravine.

COWAN: Was this around 1928?

MILLER: In 1928, and I published an article on the subject in *Fish and Game* in January 1929. I recall looking very carefully for evidence of poaching. Some of these animals were not shot. Some had fallen into the water and in this tank of water in a canyon, I found floating a doe and a lamb that couldn't get out. A further search showed me a full-grown male big horn lying freshly dead and effusion of some sort collected around his nose.

So I ascribed these various carcasses to some disease unknown to me, and I didn't want to take samples as I was not in that business. I had to go and leave a beautiful specimen, very badly putrefied, of a ram that I wanted awfully bad, but he was not "bring homeable." Those were cases among mammals.

I spent 40 years off and on as a beach comber, collecting specimens or carcasses cast up on the beach from Redondo in Los Angeles County up to as far as Santa Monica. I combed the beach once a week or once a month and picked up floaters that had been drifted in by the dominant onshore breezes there. I recall seeing cases where there must have been some epidemic. The Cassin's Auklet which spends its whole nonbreeding season out in the open ocean—I counted 93 specimens cast up on the beach, apparently fresh, in 1908. I can't remember if it was springtime or not, but it was not the breeding season, otherwise they would not have been there. I went back 2 weeks later and I found these same carcasses, only they were dried up. So this epidemic must have struck them.

Epidemics cast up on the beach many species of birds. In the case of the Red Phalarope, which is a shore bird that goes to sea in the winter, I found, in September and October 1934, there were hundreds of Red Phalaropes cast up on the beach either dead or moribund, sometimes so weak that I could pick them up or they would fly out to the water and drop down. Now that one experience with the phalarope was the only I've seen in 40 years of beach-combing. This was presumably during their southward migration. They go south and spend the whole winter out at sea. I saw them 100 miles offshore. Then when the urge comes back, they go to Alaska and nest, bring up their young and again go south. On this southward migration in 1934, evidently some epidemic struck them. I have not seen it since.

Another species I found occasionally was the Shearwater, particularly the Dusky or Sooty Shearwater. In 1922, August, I patrolled 100 yards of the beach near Santa Barbara. One of my companions kept step and counted 100 steps along the beach. I counted over 100 Shearwater bodies, all in about the same stage of decomposition. Some epidemic had hit them, and their bodies were cast up, I don't know how much farther. I didn't keep counting.

COWAN: In Antelope Valley in 1928 and '29, you were saying you saw perhaps the last antelope of that area. Where did you see them and what were you doing at the time, do you recall?

MILLER: Yes. I was out with one of my graduate students who had a large area to patrol as a fire warden. It was out by what you call Fairmont which was nothing but a broad place in the road. That country at that time was not settled up and had no water. There is a Joshau Forest Reservation in Los Angeles County and we were north of there. I don't know any post office but it was in general north and west of Fairmont.

I have more recently been going over all of my field journals from way back in 1908, way down to 1947 when I had to stop field work. I have been going over those journals correcting them if they were illegible but having them typed as is, and originals deposited either in the Bancroft Library or the archives of UCLA, the research library. I received typed scripts of all those and duplications filed in Zoology here at Davis and Zoology at UCLA and I have a copy. They include expeditions to the John Day country in 1899, first impressions of Hawaii in 1900, early work around Riverside in 1908, work in the deserts of Arizona.

COWAN: Did you go to the Farallons?

MILLER: Never got to the Farallons. Haven't got there yet. Wanted to ever since I was 11 because they used to sell the eggs, you know, and we kids love those beautiful Murre eggs. I had my little collection, about a dozen Murre eggs from the Farallons.

COWAN: Do you remember when they were collecting them and bringing them to the markets?

MILLER: No, it was before I had any notion of dates. We were just kids and collecting bird eggs, just as kids collect bottle tops or stamps.

MILLER: I wanted so much to go to the Farallons but when I came north as a student I was too blessed busy. I had to earn my food and cook it and go to the campus, study, and do a hundred other things that young people have to do when they are in college. So I never got to the Farallons then. More lately, it was forbidden to go to the Farallons, but nowadays I understand there are excursions to them in the nonbreeding season.

COWAN: Dr. Miller, you mentioned you have a little interest in the Tule Goose and would you tell me about them.

MILLER: I was greatly interested when I was publishing on the fossil birds of California and found a great variety of goose bones in two or three different deposits in California. So I knew of the Tule Goose.

ADDRESS TO THE ASSOCIATION OF INTERPRETIVE NATURALISTS, INC.

LOYE MILLER

Mr. Chairman:

I am an old man—quite old, in fact (and very fortunate). Here at my home in California, I am a long half-continent from where you are assembled in Ohio. Regrettably, therefore, I cannot come in person to receive the award your society has voted to confer upon me. However, someone has dreamed up the idea that I make a brief tape recording and send it on to serve in lieu of my person, a sort of attendance "by remote control," so to speak.

I thus salute you and through you, sir, extend to your organization my most sincere thanks for the honor conferred upon me at its 1969 convocation.

The award is accepted—accepted with humility and with profound appreciation of your thoughtfulness in recognizing service rendered so long ago.

I thank you! And again, I thank you.

And you, my junior colleagues (or are you my grandchildren?), you are all outdoors men. You I would salute with a toast in my favorite beverage—a brimming cup of cool water from a high Sierran stream, the brew of Heaven, elixir of the gods, born of a cloud, sired by the sun, near kin to the dew drop and the rainbow! Hail, outdoors men!

You are a dedicated lot. None of you took up this work with the idea of becoming wealthy. I know of no one who has made a fortune at it. But all of you are rich—rich in the enjoyment of the great out-of-doors and in the leading of others to a similar enjoyment.

In these days of great urbanization we need such workers as you. The human "psyche" can't change overnight. You and I are descended from a long line of interpretive biologists.

David, the psalmist of old, sang: "He maketh me to lie down in green pastures; He leadeth me beside the still waters; He restoreth my soul." One of you may be a mammalogist. If so, this line of the psalmist would appeal to you: "Like as the hart doth yearn for the water brook." Or are you a geologist? Then "Look up unto the hills from whence cometh my strength."

On down through the ages poets have sung of the open air. Wordsworth was an interpretive botanist when he looked upon a "crowd, a host of golden daffodils" that fluttered and danced in the breeze. He carried away an imprint which later would "flash upon that inward eye which is the bliss of solitude."

How celebrated is the English skylark! Song, story, proverb, or saying! "Up with the lark!" Truly he does put on a wonderful performance but he had wonderful publicity agents: Shakespeare, Keats, and Co. Had our Western Horned Lark employed the same advertising agency, he would, I'm sure, hold this English cousin to a tie score.

For more than a century we have sung of America's "rocks and rills," "woods and templed hills." Today we have "America the Beautiful" which carries a similar naturalistic motif. Good poets see truth and speak it in color. Oh no, you don't have to be a poet but you do need the poet's spirit to a degree. You need to be an Evangelist of Nature.

Furthermore, you need to be a crusader for the commonplace. To a real naturalist *there is no commonplace.* "The heavens declare the glory of God"; so does a mosquito, a cricket, a leaf, a bird song, or Browning's immortal "snail on the thorn." I hope such things never become commonplace to you. (The miracle of photosynthesis has not yet been completely solved.)

Taped 20 March 1969, Davis, Ca.

Half a century ago, Wallace Irwin wrote a bit of verse, speaking as a young Japanese student in school in America:

> If grasshop bugs was morely scarce to see
> And human persons was not used to its
> Remarkabilious ways, all world would be
> Admiring of his legs—the way they fits.
>
> But grasshop bugs has got around so thick
> That persons sweep them up in pans and pails
> And poets, while them loveless grasshops kick,
> Are somewhere else admiring nightingales!

There are plenty of grasshop-bugs in our back yard. They always astound me with their wonderful ability to jump (I did the running high jump in college). Besides that, they help to feed my Mockingbirds.

No! There is no such word as "commonplace" in the naturalists' book.

Our earlier National Parks were great *natural* parks. They were set aside with the thought that they were to be held sacred from the despoiling hand of man. Through their beauty or their interest they were to uplift his spirit. They were to remain as Nature made them.

Now we are coming to realize that nothing in Nature is static. She may take centuries or millennia to "build" a garden. But she doesn't stop. Even those everlasting hills are not everlasting, nor is a garden everlasting—unless you would say "everlastingly demanding (and enjoyable)."

My first visit to Yosemite was many years ago. There were open spaces. You could see the falls. From our 6 weeks' camp on the banks of Merced River, we could watch the sunset lights kindle a glow on the gray granite of Half Dome, the falls, the Arches, all the wonders of the Yosemite were visible. I stood at the outlet of Mirror Lake one day after an up-stream thunder storm and watched Tenaya Creek pour fresh sand into the upper end of the lake—clean, fresh sand. Just a bit farther up, a few spears of grass had poked through the sands of earlier storms. Beyond that was much grass dotted here and there with a few tiny willows. Then a thicket of willows and an occasional young pine. Finally, a grove of pines. I was seeing the slow passage of Mirror Lake into history.

A quarter century later I visited Yosemite Valley again—hoping to enjoy the gorgeous falls and the changing lights on Half Dome. They were almost hidden!

Someone has defined a weed as a "plant out of place." The open spaces of my first visit had grown up to weeds. The weeds were *Pinus ponderosa*—those charming little chaps now grown tall and lanky. I couldn't see over their heads. Nor could I see between them!

We need to do some very wise and long-range gardening if Yosemite's more intimate charms are to be preserved.

You, my younger colleagues, are charged with that duty! It will require much thought!

Gung Ho! Santiago! Carry on!! or what you will.

Again, thank you! And may you be late to Heaven!

Accepted for publication 6 September 1971.