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Harry E. Burke and John M. Miller, Pioneers in Western Forest Entomology

Boyd E. Wickman

John M. Miller, 1882-1952

Harry E. Burke, 1878-1963

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Author

Boyd E. Wickman is a research entomologist emeritus, Pacific Northwest Research Station, P.O. Box 3890, Portland, OR 97208-3890.

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Abstract

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This history was compiled from the memoirs, diaries, and other personal documents of the two forest entomologists in charge of the first forest insect laboratories on the west coast. It traces the lives of the two pioneers from 1902 to 1952 as they pursued their careers in the USDA Bureau of Entomology, Division of Forest Insect Investigations. Cooperative bark beetle control projects with the USDA Forest Service, Park Service, and private timber owners guided much of their early activities. Later, when the laboratories were located on university campuses, cooperative research was undertaken with Forest Service Research Stations. The focus shifted to more basic research and, particularly, studies on the silvicultural management of bark beetle populations.

Keywords: History, forest entomology, bark beetles, Forest Service, Bureau of Entomology, National Parks, insect control projects, cone and seed insects, forest fire and insects, ponderosa pine, Jeffrey pine, sugar pine, lodgepole pine, Sitka spruce.

Preface

Dr. H.E. Burke was the first forest entomologist to be hired and assigned to study insects on the west coast. He was appointed to the Bureau of Forestry in October 1902 as an assistant to Dr. A.D. Hopkins, Chief of Forest Insect Investigations. At the request of Hopkins, John Miller joined the Bureau of Entomology (the Forest Insect Investigations unit had transferred to the Bureau in 1904) in 1911 after several years as a forest ranger in the U.S. Forest Service in California. These men were the first university graduates trained in forest entomology to work under A.D. Hopkins on the west coast, but many in the forest entomology profession are barely aware of their histories or contributions to the science of forest entomology.

This biography of the two pioneers came about because of some timely correspondence in 2001. David Pratt, a grandson of H.E. Burke, requested some information from Dean John Brown, Washington State University. The university had just honored Burke as its first graduate in entomology. Dr. Brown referred David to me and other forest entomologists, starting a chain of events. I provided David an early photograph of Burke and his unpublished memoir. David then provided me with a genealogy of the Burke family and suggested I write to Burke's two surviving daughters: Dorothy Burke Walker, born in 1914, and Janet Burke Eglington, born in 1920. They both enthusiastically responded to my inquiries for information about their father with unpublished material, short vignettes by other Burke children about life with their father, and some family photographs.

Daughter Janet carried on an invaluable correspondence with me from 2002 through 2004. She provided her memories of family lore and events, has been my sounding board, and inspired me to keep moving on this project. Most importantly, she introduced me to her childhood friend Betty Miller Moore via correspondence. Betty is the daughter of John M. Miller, the second forest entomologist on the scene in this account. Through Betty I learned

that John Miller had kept diaries of his professional duties from 1907 until his retirement in 1951. The diaries were in the possession of Betty's niece, Susan Miller Lowenkron, who graciously entrusted Miller's diaries to me for research and eventual archiving. She also mentioned many letters that her grandfather had written to his wife while in the field with the USDA Forest Service and the Bureau of Entomology. We all recognized the importance of these letters because Miller had left no biographical material about himself. Betty and Susan began the painstaking job of typing and organizing these letters by date and providing me with pertinent copies.

At this point I felt that both men deserved a published biography of their lives and contributions to the science of forest entomology. When I was employed by the Forest Insect Laboratory (Bureau of Entomology and Plant Quarantine) and a student at the University of California, Berkeley, in 1948, I assembled a small number of Burke's memoirs for limited distribution. I kept one of these original copies for 54 years thinking someday I would try to formally publish it. I got as far as publishing, as editor, only a small part of Burke's memoirs.[1]

My connection to John Miller was slightly different. I actually worked for Miller as a student, sometimes summarizing his field data at the Berkeley office. Miller was in charge of the Forest Insect Investigations Laboratory of the Bureau of Entomology for many years. In the summer of 1951, shortly before he retired, he assigned me to a detail on the large Colorado Spruce Beetle Project as a survey crew leader. At that point, I had taken several entomology courses, but my major was education. I had worked as a student assistant in the field and office since 1948, and he evidently felt I could do the job. This assignment changed my life. Most of the men detailed to the Spruce Beetle Project from the Bureau of Entomology were graduate entomologists with considerable experience. Miller's trust in me affected me deeply. I must have passed muster because when I returned to Berkeley, I was assigned increasingly responsible jobs. Of course, after that, John Miller was my hero. I immediately changed my major to forest entomology in the fall of 1951.

I vowed to someday write a biography of Miller. However, sources were rare because he just didn't write anything about himself. The closest I came to his story was an article written in 1987 about the Ashland Field Station, which he led from 1912 to 1924.[2]

Combining the story of these two pioneer entomologists makes sense beyond my personal bias. Miller came to the Bureau of Entomology 9 years after Burke's appointment, but from the moment of his arrival he was given managerial responsibilities by A.D. Hopkins, Chief of Forest Insect Investigations; for all practical purposes, Miller was coleader, with Burke, of the bureau laboratories and field stations until 1923 when he was placed in charge of all forest insect investigations on the Pacific coast. Burke and Miller were gentlemen of the highest order. I have yet to find a critical comment from either man

[1] Burke, H.E., Wickman, B.E. 1990. Northeastern Oregon bark beetle control project 1910-11. Gen. Tech. Rep. PNW-GTR-249. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

[2] Wickman, B.E. 1987. Early forest insect research in the Pacific Northwest: Ashland Field Station, 1912-1925. Oregon Historical Quarterly. Spring: 27-48.

about the competitive leadership situation that was forced upon them by Hopkins, or about their brilliant, but sometimes cantankerous, boss in Washington, D.C.

Accounts from both families indicate that Burke and Miller were more than colleagues. As friends, they shared family camping trips and social events.

My approach to writing these biographies was to use, as much as possible, the words of the two men, by using direct quotes and passages from autobiographies, family letters, diaries, official correspondence, published and unpublished reports, oral histories, and the short-lived "Forest Insect Newsletter."[3] Burke and Miller descendants were also most generous with their recollections that helped tie the personal family lore to the official activities.

My contributions were minimal and involved organizing the text, locating photographs, and providing additional historical detail or interpretations when warranted. All errors concerning dates or interpretation are absolutely mine. I hope future generations of historians will give me some latitude, because this is not strictly a history of forest entomology in the West. It is meant to record the human side of two really fine gentlemen and outstanding scientists. I have tried to weave some of the significant historical events into the story to indicate how these pioneers in a new forest science influenced our current thinking.

I hope I have succeeded in making their colorful lives and times a good read.

[3] The newsletter name changed several times. See "Other Sources" section.

Contents

Chapter 1: Burke's Childhood and Education

An Indian attack in Paradise Valley, Nevada, during the summer of 1878 (the Bannock Indian War) had important consequences for the future of forest entomology in the Western United States. The danger and upheaval of the attack caused a young homesteader, his wife, and 6-week-old baby to pull up stakes and head for a safer more settled clime. Thus began the life of Harry Eugene Burke, who might have grown up to be a Nevada farmer rather than an eminent pioneer in Western forest entomology. Here is Burke's memory of those days from his unpublished autobiography.[1]

> I was born May 19, 1878 in the old Camp Scott buildings at Paradise Valley (North of Winnemucca), Nevada. My ancestry was typically American. The Father, Harry Daniel Burke, was an emigrant from Hanover, Germany, who had served through four years of the "war between the states" as a cavalryman in the Northern Army. His father and several older brothers had been killed fighting the Prussians in 1848. His mother died soon afterwards and he moved to America in 1859. After his discharge from the army he moved west and was growing wheat near Chico, California, when in 1876 he met Sarah Eugonia Jones who was teaching school near Chico. They were married in 1877 at Mt.View, California and soon after left for Nevada in search for more and better land. They finally reached Paradise Valley where I was born.
>
> The Jones family moved from Wales to North Carolina in 1735 and Sarah Eugonia's grandfather and several uncles fought in the American Revolution with Washington. Her father was captain of an artillery company on the Southern side during the "war between the states." Before the war and afterwards he was a Methodist minister for sixty years as well as a storekeeper and newspaper man. Because of some hot editorials during the war, he was much sought after by some of Sherman's men when they marched through Georgia to the sea. Parson Jones, however, managed to keep out of the way of the Yankees and soon after the war was over migrated to Missouri with his family. California was the promised land, so on to California they went in the 1870's.
>
> I was six weeks old when the Paiute Indians made a raid through the Paradise Valley and the Burkes moved back to California and settled near Mayfield in the Santa Clara Valley. [Insert by daughter Claire –"I remember hearing tales of this flight in a spring wagon. Mother and infant were bounced out, but Sarah Eugonia held the baby so high that even his long white dress did not get in the mud."] After three years, in 1881, the family, now composed of two sons and the parents still in quest for better land, moved to what was then Washington Territory and settled in the White River Valley south of Seattle.
>
> In 1881, due to illness of my father, the family now including two more sons and a daughter, returned to California. Father died in 1888. In 1891 the family, with a new stepfather, Alford C. Baker, returned to Washington."
>
> By the spring of 1897, I had managed to spend enough time in the public schools of Washington and California to graduate with the first high school class in Kent, Washington.
>
> 1897 is noted in northwestern history as the year of the great gold discovery in Alaska. Then nineteen, I was offered the choice of joining the gold rush to Alaska or of being the first King County free scholar to attend the then rather new Washington Agricultural College and School of Science at Pullman, Washington. Carrying 100 lb. sacks of flour over White Pass on my back in the snow did not appeal to me, so I accepted the scholarship and enrolled at the college (now Washington State University) in September, 1897, as a senior preparatory student.
>
> The first year, due to the Alaskan influence, my major study was mining engineering. The second year it was economic science and history with law the final objective. But one fine day during the spring of the second year, I went on a collecting trip with a class-mate who was studying insects. That trip opened up new visions and solved the problem of choosing a life's work. For the third and final time a major was chosen, this time it was Zoology.
>
> After five years at Washington State, I graduated June 19, 1902 with high honors and the degree of B.S. in Zoology.

[1] H.E. Burke prepared an autobiography, *My Recollections of the First Years in Forest Entomology* in 1946 at the urging of his colleagues J.M. Miller and F.P. Keen. The intention was to publish the manuscript after it was carefully edited by Miller. Unfortunately this never happened. It remained an unpublished report widely referred to by forest entomologists. The Burke family provided me with an early draft of Burke's autobiography that Miller deleted from the official report. This heretofore unknown draft is the basis for the first chapter.

While at Washington State, I achieved a number of political and other student honors. Among these were president of the class of 1902 during the freshman year, treasurer of the class the last three years, president of the Websterian Debating Society, lieutenant in the cadet corps, member of the board of athletic control, business manager of the college yearbook (Chinook 1902), and member of the college track team with points against Washington, Idaho and Whitman in shot and discus.

During the summer of 1900 I was assistant at the Washington State Oyster Experiment Station, Keyport, and during the summer of 1901, laboratory assistant in Entomology at Washington State.

Also while at Washington State, I made my first contact with forest insects. I became acquainted with J.L. Webb who was studying forest insects under the direction of Dr. A.D. Hopkins, then at the University of West Virginia, and made several trips with Webb in the forests near Moscow, Idaho collecting various insects from western pine beetle-killed yellow pine.

Upon my graduation, I received an appointment as special field agent with the Division of Entomology, U.S. Department of Agriculture and spent the months of July, August and September in 1902 in Boise, Idaho carrying on investigations of codling moth life history and control under the direction of C.B. Simpson.

While at Boise, I received a letter from J.L. Webb who was then in the Black Hills of South Dakota working on the Black Hills beetle, saying that Dr. Hopkins was looking for an assistant in forest insect investigations just starting in the Division of Entomology and that Webb was recommending me. A letter was also received from C.V. Piper, professor of Zoology and Botany at Washington State, saying that he was recommending me for the job with Hopkins. I therefore applied and was appointed a special field agent in the Division to take effect October 1, 1902 and ordered to report to Webb at Elmore, South Dakota.

The month of October was spent with Webb learning the forest insects and assisting in taking the life history and in experiments to determine if it were possible to trap the Black Hills beetle by girdling and falling trees in various ways and at various times of the year. Rocky Mountain yellow pine were back girdled, belt girdled, peel girdled and fallen at regular intervals.

On November 1, 1902 I was appointed as assistant forest expert in the Bureau of Forestry and ordered to Washington to work on forest insects under the supervision of Dr. Hopkins.

The winter of 1902-1903 was spent working on the insects collected in the Black Hills by Webb and me. The adults were classified to species as far as possible and all material was filed in collection and the notes catalogued.[2]

When his father died, Burke was only 10 years old. Family lore has recorded that his mother struggled to keep the farm going, raise a large family, and all the while instill the importance of education in her children. When she remarried in 1891 and the family returned to Washington state, the die was cast for Harry to receive his education in public schools and Washington State College (now Washington State University). His choice of college was perhaps a strong influence on his chosen vocation because the campus was close to forests, and while there he met J.L. Webb, a pioneer forest entomologist who recommended him to A.D. Hopkins for a professional position as a forest entomologist. Burke and Webb remained lifelong friends, and Burke became the first entomologist assigned to the Pacific Slope Region by Hopkins.

The next three chapters are reproduced verbatim from Burke's "My Recollections" report and include photographs as presented by Burke (1946). In his recollections, Burke introduced A.D. Hopkins, who was considered the father of forest entomology.

[2] Unpublished manuscript from the descendants of H.E.B. Biographies of the men connected with the Northeastern Oregon Control Project, Bureau of Entomology, 2. Harry Eugene Burke, an Autobiography.

Chapter 2: A.D. Hopkins and How Forest Insect Investigations Were Started

At its beginning, forest entomology in the United States evolved mostly around one man, Andrew Delmar Hopkins (1857-1948). His illustrious career began, not with a formal education in the subject, but as a young farm boy intensely interested in forest insects and willing to work for $1 per day. Hopkins' life has been described by Rowher (1950), Berisford (1991), and Furniss (1997b). The story of Hopkins and his relationship to Burke is best told in the latter's own words (Burke 1946).

> Dr. A.D. Hopkins was the first chief of the Division of Forest Insect Investigations and directed this work in the Bureau of Entomology from 1902-1923. Previous to that he had been: farmer, 1877-1890; entomologist, West Virginia Experiment Station, 1890-1902 and vice-director, 1897-1902; Professor of Economic Entomology, University of West Virginia, 1896-1902; author of many bulletins on insects and holder of many scientific honors. He has often been called the Father of Forest Entomology in America.
>
> Hopkins' experience in western forest areas was limited to brief trips. In 1899 he made a trip out of Washington, D.C., lasting from April 9 to June 17, in which he visited areas in California, Oregon, Washington and Idaho, which was quite remarkable in its results. In this short period he collected 4,363 specimens and took 760 notes. Later developments showed that he had uncovered and correctly interpreted most of the important forest insect problems of the region. As a result of this trip, he published "A Preliminary Report of the Insect Enemies of Forests in the Northwest." In 1902, 1903, 1904 and 1905 he made trips into the Black Hills, Pacific, Colorado and southwestern areas. In 1911 he visited the Northeastern Oregon Project and areas in northern California. His last trip to the west was made in 1915 when he made the rounds of western field stations.
>
> To start at the beginning we have to go back to the Hatch Act passed by Congress in 1887. This law appropriated money for the organization of the State Agricultural Experiment Stations. Most of these stations soon established departments of entomology. The West Virginia Station at the University of West Virginia, Morgantown, decided to establish such a department in 1890. There were two applications for the position of entomologist. One wanted a salary of $2,000 (real money in 1890) and a secretary. The other, A.D. Hopkins, offered to do the work for nothing if he were allowed to live on his farm. Hopkins was given the position and started on his official entomological career.
>
> On a trip made through the state of West Virginia in September 1890 Hopkins found great quantities of dead spruce in Randolph County. An examination indicated that bark beetles were the cause. This discovery caused Hopkins to make further investigations in the forests of the State, which started him on the road to becoming the Father of Forest Entomology in the United States. A trip was made to Europe in 1892 to collect specimens of the European bark beetle destroyer, *Clerus* (*Thanasimus*) *formicarius L.*, for introduction in the forests of West Virginia to prey on the southern pine beetle.
>
> As the leading authority in the United States on forest entomology, Hopkins was chosen by the Division of Entomology, U.S. Department of Agriculture, to make an investigation of the Pacific Coast forests during the summer of 1899. On this trip he found the western pine beetle and the mountain pine beetles killing numbers of trees in the pine forests of California, Oregon, Washington and Idaho.
>
> One stop on the trip was at the Washington State College at Pullman. Here Hopkins visited G.V. Piper, entomologist of the Washington Experiment Station. Together they made a trip into the pine forests of western Idaho to study various insects, one of these the western pine beetle.
>
> As a result of this trip, Piper induced one of his students, J.L. Webb, to take up forest insects as a major. Webb, therefore, was probably the first college student of forest insects in the United States. Webb collected forest insects in western Idaho during 1900 and 1901 and in studying them corresponded with Hopkins.
>
> In 1901 the Chief of the Bureau of Forestry of the Philippines requested Gifford Pinchot, Chief of the Bureau of Forestry of the U.S. Department of Agriculture, to get him a forest entomologist. Pinchot passed the request on to Hopkins who replied there were none, but he would train one if given time. This suggestion was followed and Webb, the only known student, was appointed a field assistant in the Bureau of Forestry in the fall of 1901 and sent to Hopkins at the University of

West Virginia to train for the Philippine position. As a side light, it should be said that Webb did not know that a field assistant was supposed to have expenses, so he worked the winter of 1901 at $25 per month and subsisted himself.

The appointment of Webb by the Department of Agriculture to work on insects under Hopkins stirred [L.O.] Howard, Chief of the Division of Entomology, into action. He started to work toward the establishment of an Office of Forest Insect Investigations in the Division.

In the meantime the Black Hills Beetle had started its destructive work in the yellow pine forests of the Black Hills of South Dakota and Wyoming.

In May 1902 Webb was appointed an Assistant Forest Expert in the Bureau of Forestry and sent to the Black Hills to investigate the trouble under the direction of Hopkins, who was to be appointed July 1 Chief of the new Office of Forest Insect Investigations in the Division of Entomology.

Since Webb was expected to take the Philippine position, an assistant to take his place was needed. I had collected some with Webb in 1900 and 1901 and was recommended by him for this appointment. Being already in the Division of Entomology on a three-month appointment to work on the codling moth at Boise, Idaho, I was appointed October 1, 1902 as Special Field Agent of the Division, to investigate the damage to forests and forest trees by insects and was sent to the Black Hills to receive training from Webb. On November 1, 1902, I was appointed an Assistant Forest Expert in the Bureau of Forestry and ordered to Washington to work on forest insects under Hopkins, following Webb in by about a week.

The Office of Forest Insect Investigations therefore completed its first six months with Dr. A.D. Hopkins, an appointee of the Division of Entomology, in charge with J.L. Webb and myself, appointees of the Bureau of Forestry, as assistants. During the spring of 1903, W.F. Fiske, Assistant State Entomologist of Georgia, was appointed a special field agent in the Division of Entomology and assigned to work on forest insects under Dr. Hopkins. All expenses for the work were paid by the Bureau of Forestry.

This organization continued until July 1, 1904, when the Division of Entomology became a Bureau and Webb and I were transferred from the Bureau of Forestry to the Bureau of Entomology. Webb did, however, spend the field season of 1903 in the Philippines as an appointee of the Philippine Bureau of Science.

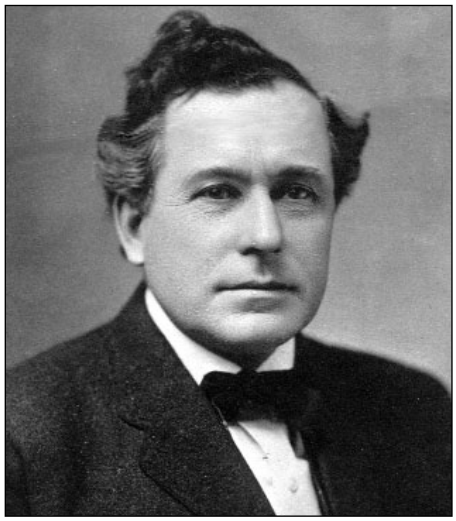
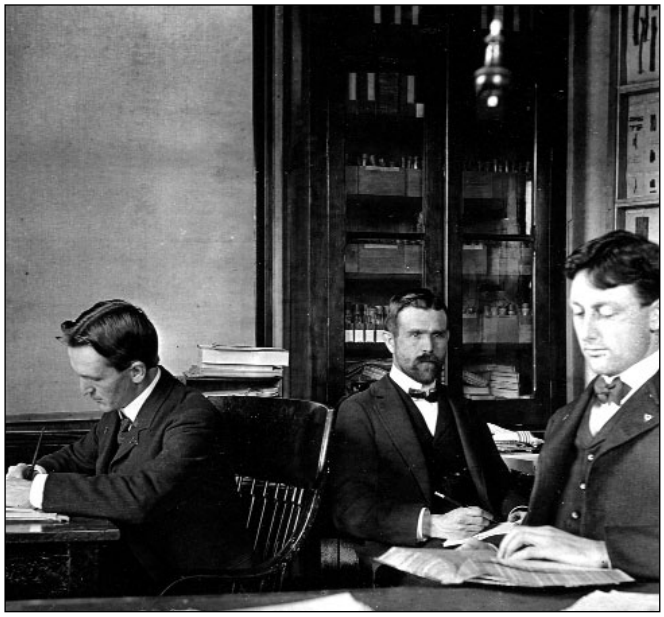


Figure 1—Andrew Delmar Hopkins (1857-1948) Washington, D.C., March 1909.

It was during the winter of 1902-03 that Dr. Hopkins suggested to Webb and myself that each of us specializes on some important family of forest insects as Hopkins had specialized on the Scolytidae. Webb selected the Cerambycidae and I the Buprestidae. Dr. Hopkins also submitted a plan for dividing the United States into four major forest areas for forest insect fieldwork with a man specializing on the insect problems in each area. The areas suggested were the Eastern, the Southern, the Rocky Mountains, and the Pacific Coast. Webb took the Rocky Mountain region due to his experience with the Black Hills beetle and in the yellow pine forests of Idaho. I selected the Pacific Coast mainly because I was from that section and already familiar with some of the conditions [figs. 1 through 3].

The epidemic of the Black Hills beetle, which ran from about 1898 to 1907 in South Dakota, was the first case of western bark beetle depredations to receive serious attention from foresters. It resulted in the heavy killing of ponderosa pine. The Black Hills outbreak so impressed Gifford Pinchot that he took aggressive action which finally resulted in the establishment of the Division of Forest Insect Investigations (Furniss 1997a).

As a result of the studies that were made in the Black Hills, control methods were devised and a limited amount of control work was done. The epidemic soon subsided, however, and no field stations were set up for continued studies in this area.



H.E. Burke, PSW

Figure 2—The first office occupied by forest entomologists in the old insectary, U.S. Department of Agriculture, Washington, D.C., December 1902. J.L. Webb (left), Lee, and H.E. Burke. Lee was the first stenographer and clerk employed by Hopkins. He worked for one winter only and was replaced by E.C. Wood.

Most of the major forest insect problems of the era were apparently in the western portion of the United States. Burke's appointment made him, at the time, the only formally trained entomologist in the Bureau of Entomology in the west coast. The seat of power was, of course, in Washington, D.C., so when Hopkins was appointed Chief of Forest Insect Investigation in the U.S. Department of Agriculture, he maintained his office there. Even though he was far from the scene of action (a train trip from Washington, D.C., to California for instance took several days), he still managed periodic field trips to the West. He also maintained tight control over his field assistants and, in the early years at least, few decisions were made in the field without telegraphic or postal consultations with Chief Hopkins.[1] This micromanaging from afar eventually affected the morale of the field men and probably the speed at which some projects could proceed. This would play a role in the careers of both Burke and Miller.

John Miller's arrival in the Bureau of Entomology Forest Insect Investigations occurred about 9 years (1911)

H.E. Burke, PSW

Figure 3—Pioneer forest entomologists and forest pathologists, Black Hills, South Dakota, July 1902. (Left to right) J.L. Webb, assistant forest expert; Dr. Hermann VonSchrenk, in charge of forest pathology, Bureau of Plant Industry; Burns, assistant in forest pathology; Dr. A.D. Hopkins, in charge of forest insect investigation.

after Burke's, but his professional background with the then newly formed U.S. Forest Service from 1907 to 1911 is a fascinating story in itself. In those early years Miller kept a fairly detailed diary and wrote dozens of letters to his soon-to-be wife describing the duties of a pioneer Forest Service employee, but first, Burke's autobiography continues with an account of his first forest insect investigations on the west coast.

[1] Correspondence between Burke and Hopkins between 1910 and 1911 in my possession.

Chapter 3: Exploratory Work in Western Forests, 1903-1910

Burke's autobiography continues with brief accounts of his fieldwork in Washington, Oregon, and California. His apparent independence to travel about during these first 7 years was likely because Burke had no responsibilities for insect control decisions, project management, or supervision. He mainly collected insects, made field notes on their life histories, and returned to Washington, D.C., each winter to write reports and prepare his specimens. This fit right in with Hopkins' plan of learning as much as possible about forest insects in the United States, having specimens available for reference, and publishing the results of investigations. Hopkins sometimes was less than generous with his authorship and credit for illustrations. And while his men were in Washington he was no doubt sizing them up for future responsibilities and indoctrinating them in his philosophies of insect control, for with Hopkins the only good bark beetle was a dead bark beetle.

These early years seemed to have influenced Burke in another direction. He truly enjoyed collecting specimens and studying the biology and life histories of insects new to science. This probably resulted in some of Burke's later career choices.

Now back to Burke's autobiography.

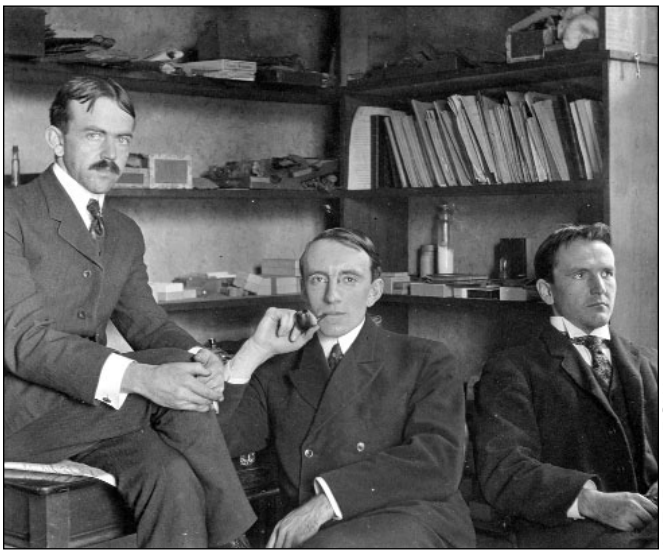
> In April 1903 I left Washington with orders to proceed to the Grays Harbor Country of western Washington and establish a station whose field of operation would be Washington, Oregon and California. The main projects were to determine (1) the span worm that had defoliated large areas of hemlock and spruce about 1891, (2) the maggot or other insect that causes the injury to living hemlock and produces a defect in the wood known as black check, (3) the bark weevils that cause damage to reproduction of spruce, fir and other conifers and (4) the bark and wood-boring insects that damage Douglas-fir.
>
> The station was established at Hoquiam, Washington. About all that could be found out about the span worm was that it had occurred a number of years before and had done a lot of damage. Some old snags were found in the Hoquiam River basin that were said to be the remains of trees killed by the span worm. The hemlock bark maggot was found and cages were placed on the trees to rear the adults. A similar bark maggot was found in the bark of the grand fir. Several species of bark weevils were found. Among these was a new species that severely injured the terminals of Sitka spruce. Various types of girdled trap trees of Douglas-fir, Sitka spruce, western hemlock and Pacific red cedar were made at regular intervals throughout the season and numerous insects and notes on their biology were collected. Trips were made to Willapa Harbor, Pialschie [sic] and to Moscow, Idaho, to study forest insects at these places.
>
> The winter of 1903-04 was spent in Washington, D.C., working on reports and on collections of insects made during the summer.
>
> For the field season of 1904 I returned to Hoquiam, Washington, with trips to Palo Alto, California, Snoqualmie, Smiths Ferry, Idaho, Elmore and Nemo, South Dakota, and St. Louis, Missouri. This season I succeeded in rearing the adults of the hemlock bark maggot and the grand fir bark maggot and determined the main points in the biologys of these insects and of the *Pissodes* in the spruce terminals. A *Pissodes* working in the basal bark of young spruce and one in the basal bark of Douglas-fir were also studied. Many observations were made on numerous other forest insects such as the bark beetles, the wood-stainers and the woodborers. The western oak spanworm was studied and reported in epidemic form for the first time. At Smiths Ferry, Idaho, a new *Pissodes* was found in the terminals of Engelmann spruce and a study was made of an epidemic of the western pine beetle in a commercial stand of yellow pine and of the Douglas-fir beetle in a commercial stand of Douglas-fir. This was probably the first study made of such epidemics.
>
> On July 1, 1904 the Division of Entomology was made a Bureau and I was temporary Field Agent transferred from the Bureau of Forestry. This was a promotion in salary from $600 to $1200 per annum and was the realization of one of my youthful ambitions to have a government job at $100 per month.
>
> The winter of 1904-05 was spent in Washington, D.C., as before. The main feature was the publishing of U.S.D.A. Circular No. 61 "Black check in western Hemlock." This was the first scientific paper that I published [figs. 4 through 6].
>
> Part of the field season of 1905 was spent at Hoquiam and Pialschie with a trip to Rainier in

H.E. Burke, PSW

Figure 4—The Washington office, 1904-1906. In 1903, Dr. Hopkins moved his office from the insectary to these quarters in a private building at 904 B Street, S.W. Practically all of the work on the *Dendroctonus* and *Pissodes* bulletins was done here. This room was occupied until 1908. (Left to right) W.F. Fiske, Special Agent for the Southern States; E.C. Wood, clerk and stenographer; Dr. A.D. Hopkins; J.L. Webb, Special Agent for Rocky Mountain States; J.F. Strauss, artist; and H.E. Burke, Special Agent for Pacific Coast States.

H.E. Burke, PSW

Figure 5—On the grounds of the National Museum are seated (left to right) Strauss, Webb, and Burke. Standing are Van Horn and Wood. Van Horn came into the Division as a preparator and was rated as an entomologist of great promise. He mysteriously disappeared in February 1909. No trace of him was found, but it was suspected that he drowned in the Potomac River.



H.E. Burke, PSW

Figure 6—Forest Insect Investigations, Washington, D.C., November 21, 1905. (Left to right) W.F. Fiske, Phillips, and J.L. Webb. In 1903, W.F. Fiske, then Assistant State Entomologist of Georgia, was appointed by Hopkins as a special field agent to study the forest insect problems of the Southern States. He continued on this assignment for a few years only and was then transferred to the gypsy moth work in the New England States. Fiske became well known for his work on the introduction of parasites of the gypsy and brown tail moths. Phillips was in charge of the bee culture for the Bureau of Entomology.

August. The main feature of this season's work was the finding of the larva of the cedar pole borer which was damaging many standing red cedar.

We now know that the borer was a flathead, but which one? A new *Pissodes* was found infesting the alpine fir on Mt. Rainier and the mountain pine beetle was found to be killing western white pine at Longmires.

Since it was thought that the main facts about insects in the forests of the Pacific Northwest had been determined and because Dr. Hopkins had found extensive bark beetle damage to yellow pine and sugar pine on a trip to the Yosemite in 1904, it was decided to move the Pacific station from Pialachie to California in 1906. Professor J.H. Comstock's report that on a trip to the Yosemite in 1905 he had seen a great flight of small moths and much dying lodgepole pine probably had its influence too.

During April 1906 I completed some observations at Pialschie which include the finding of fragments of a *Trachykele* beetle indicating that a species of *Trachykele* might be the borer of the living cedar. The move to California was made in May

shortly after the San Francisco earthquake. After a few weeks at Palo Alto I went to Wawona. I spent a week there, ten days in the Mariposa Grove of Big Trees, and the established temporary headquarters at Summerdale (now known as Fish Camp). Many insects were collected and infested trees marked for further study. Small sugar pine and yellow pine were cut for trap trees. The period from July 10 to August 11 was spent in the Yosemite with one week in the little Yosemite and one week in the Tuolumne Meadows. The return to Fish Camp was made August 12 and the investigations continued there until September 17.

One of the principal results of the season's work was the discovery in the Mariposa Grove that *Trachykele* was the destructive borer of the Pacific red cedar. The Yosemite may seem a long ways from the red cedar forests of the Pacific Northwest, but we already had the boring larvae and only needed to connect it with the adult to determine the species. The finding of *Trachykele opulenta* larvae and young beetles in a small Sequoia in the Mariposa Grove proved that the borer of red cedar was also a trachykele. And the fact that *Trachykele blondeli* beetles were found in the red cedar forests indicated that species was the one causing the damage.

The western pine beetle was found killing scattering yellow pine in both Fish Camp and the Yosemite areas. The mountain pine beetle was found killing scattered sugar pines and yellow pines in the Fish Camp area and large numbers of lodgepole pines in the Little Yosemite just north of Lake Tenaya and around the Tuolumne Meadows. No needleminers were found, but the foliage of the trees on some areas looked thin and abnormal.

One important discovery in 1906 was a new species of *Dendroctonus (jeffreyi)* which was killing Jeffrey pine around the top of Yosemite falls and in the Little Yosemite.

At Fish Camp an epidemic of the fir tussock moth *(Notolophus oslari)* was studied and numerous parasites reared. The defoliation of the tops of many large white firs caused the death of a large percent of the tops and the loss of the seed crop for the year.

After a few weeks at Palo Alto in late September and early October studying the insects of Monterey pine and the Monterey cypress, I returned to Washington, D.C., October 17 [fig. 7]. The winter of 1906-07 was spent as usual working

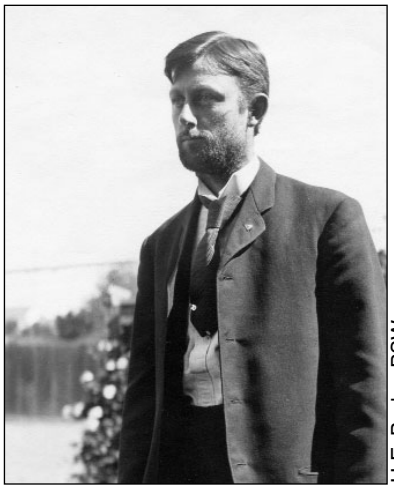


Figure 7—Harry Eugene Burke, at Palo Alto, California, after field season in the Yosemite country, 1906.

up the notes taken during the summer and in classifying and filing the insects and the information about them. A special study was made of the Buprestidae, particularly of the larvae. This included a key to the various genera.

The field season of 1907 from May 31 to October 24 was given over to a series of studies in northern and southern Utah with trips to Joseph, Oregon, and Palo Alto and Pacific Grove, California [fig. 8]. The results of the 1907 season were the recording of numerous observations and the determination of important points in the biology of the mountain pine beetle, the western pine beetle, and the red turpentine beetle. A new *Pissodes*, afterwards described as *burkei* by Dr. Hopkins, was discovered attacking the trunks of living alpine fir near Kamas, Utah. An infestation of the mountain pine beetle found near Joseph, Oregon, was one of the starting points of the great northeastern Oregon epidemic which killed millions of lodgepole and yellow pines during the next five years.

The winter of 1907 and practically all of 1908, 1909 and the first four months of 1910, except for occasional short field trips, were spent in Washington, D.C. working on the numerous notes and specimens collected during the first five years of forest insect investigations.

One of the field trips during this period included Custer, South Dakota, August 21-24, 1908, to study the end of the great Black Hills beetle epidemic. All that could be determined was that the epidemic appeared to be over. Only seven infested trees could be found. I also visited Anaconda,

H.E. Burke family

Figure 8—The Burkes spent their 1907 honeymoon camping in the Utah wilderness while Burke accomplished fieldwork. These photos show them cooking in camp.

> Montana, from August 27 to September 7 on the same trip to investigate the relations of forest insects to the killing of trees and other vegetation around the smelter areas. The conclusions were that the insects had practically no relation to the smelter-killed trees. Most forest insects were very scarce, seemingly due to being scattered through a great amount of slowly dying timber. The report on this investigation was used as evidence in several suits for damages caused by the smelter smoke.
>
> Thus far in this autobiography I have retraced some of the trails which I followed in western forest entomology from 1902 up to the spring of 1910. This was largely a period of exploration of the field to locate the more important problems. After this period the Bureau of Entomology began to develop both control and research programs in the western forests.
>
> This account brings us up to the Northeastern Oregon Bark Beetle Control Project which was the first large undertaking of its kind in this country and marked the beginning of a considerable expansion of the Division of Forest Insect Investigations.

Burke did a prodigious amount of forest insect collecting and studies on the life histories of those insects. His lengthy periods in the Washington office identifying his collections and preparing his notes for publication was excellent training that Hopkins required of his field entomologists. It probably instilled the lifelong habit that was characteristic of Burke, publishing his studies of insects in numerous well-written publications.

Burke's responsibilities were about to change, perhaps not to his liking. Some unknown poet very cleverly expressed the evolving relationship between the Bureau of Entomology and the U.S. Forest Service over the control of bark beetles.

> Whatever killed that monster pine
> Whose branches pierced the clouds so fine?
> Ask Doctor Graves, he herds the trees,
> Perhaps it is an extra freeze.
> "Freeze nothing" Doctor Graves' reply
> "It's fire that kills all trees that die
> Except a few that lumber jacks
> May murder with the saw and axe."
>
> "Fire never killed that forest tree"
> Says Doctor Hopkins, "You hear me:
> Bugs killed that tree, son, don't I know
> My printed books have told you so.
> For years I've warned you bugs were bad
> But you have just been fire mad.
> Trees killed by bugs in twenty years,
> Value one billion dollars it appears.
> From Hopkins's bulletin eight three
> Page four I name as referee."
>
> Thus Graves and Hopkins don't agree
> On what or who killed that big tree.
> But still the bugs grow fat and strong
> No matter which is right or wrong.
>
> -Anonymous

Chapter 4: The Northeastern Oregon Bark Beetle Control Project, 1910-1911

As Burke pointed out at the end of the last chapter, the Northeastern Oregon Bark Beetle Control Project in 1910 was the first of its kind in the United States and marked a change in the way Forest Insect Investigation entomologists carried out their duties. A portion of Burke's biography covering this project was published earlier and edited by the author. It goes into greater detail than Burke's biographical history of the project (Burke and Wickman 1990).

Hopkins was not an idle bureaucrat in Washington, D.C. He was a first-rate scientist and entomologist, but he was also an effective promoter. The Division of Forest Insect Investigations in the Bureau of Entomology was not going to be an academic organization collecting, cataloging, and writing about forest insects. Hopkins had a vision for the organization very early as co-managers and active advisors for the U.S. Forest Service and later the National Park Service in matters relating to forest insects. These two public agencies managed most of the forested public lands in the United States, and where there were forests there were insects feeding on trees and in many cases causing tree mortality over thousands of acres.

Hopkins was a member of the Washington, D.C., Cosmos Club. Most of the politically elite were also members including Chief of the Forest Service, Gifford Pinchot and his soon-to-be replacement Henry Graves. The year 1910 was called the "year of the fires" by historian Stephen J. Pyne not without cause (Pyne 2001). Millions of acres of prime timberland burned over a long dry fire season in the Western United States that year. Dozens of firefighters and settlers (the exact numbers will never be known) lost their lives. It changed the way the public and government agencies viewed forest fires for almost a century.

Prior to these fires, the Forest Service under Pinchot took a more ecological view of forest management. That is, all forest influences; biotic, like insects and diseases, and abiotic, like windstorms, drought, and fire, played a role in the life history of a forest. Insects or fire might kill trees over hundreds or thousands of acres, but in the big picture they did not usually devastate forests. After 1910, forest fires and the unacceptable loss of life they incurred, were paramount in the planning, budgeting, and managing of national forests. Against this tide, Hopkins argued valiantly that, taken together, forest insects and diseases caused more forest mortality, year in and year out, than one aberrant fire year like 1910.

The bark beetle situation in northeastern Oregon played right into his hands. Mainly through Hopkins' drum beating, both Forest Service personnel and private timber owners were aware that the "Forest Insect Investigations" division had trained entomologists who were willing to live in the field and help them combat the menace of bark beetle outbreaks. The private landowners petitioned the government to do something to reduce or stop the tree killing. Forest Service field people were also concerned and requested assistance. However, there was some reluctance from Forest Service people higher in the organization to dilute their efforts against forest fire by assigning rangers or spending money on killing **bugs**!

Hopkins was not shy about promoting his views. He visited northeastern Oregon in March 1910 and talked over plans for a grand control project with whoever would listen, including a Town Hall type meeting in Baker City, and started lobbying for a Congressional appropriation.[1] Hopkins placed Burke in charge as his technical representative. This was Burke's first assignment where he set up a field station, supervised others, made technical decisions, and essentially managed the project work. All was not smooth sailing, however, and the Forest Service leaders in Washington, D.C., and the district office in Portland, Oregon, were wary about having their rangers report to, or be under, the direction of one of Hopkins' entomologists. The Forest Service's cooperation was vital in order to obtain the needed appropriation of $25,000 to carry on the control project and to make it a viable biological operation given that much of the outbreak was on federal land.

The following exchanges and agreements were found in documents in my possession. They are not in Burke's autobiography so I will record them before proceeding to Burke's version (Burke and Wickman 1990).

[1] Appendix. Hopkins even had a "broadside" type handout to vent his views on the matter.

The shortcomings in agency cooperation that had actually begun early in the spring of 1910 were reported by Burke to his chief, Hopkins, and resulted in a flurry of letters and meetings in April 1910 between Hopkins and H.S. Graves, Chief of the Forest Service, in Washington, D.C. One meeting took place at the Cosmos Club and resulted in Graves writing to Hopkins, " . . . I read over your memorandum of our conversation at the Cosmos. In the account of my statement there are a number of errors, which I will correct and show to you as soon as I have an opportunity. They do not matter much as long as we are able to get together on the general proposition." Hopkins tactfully replied, " . . . I was doubtful about some of the features in our conference and am glad that you will correct them. I agree with you heartily that the thing is to get together on the main proposition and proceed to **kill the beetles**."

Hopkins was a strong individual who was going to insist that Bureau of Entomology personnel remain in technical charge of forest insect control projects on federal lands. It was also evident that at least some Forest Service people resented this intrusion of nonforesters into their domain. Hopkins insisted, on recommendation from Burke, that only one technical expert be in charge of a control project and that that person be an entomologist, namely, Burke. Hopkins and Burke also felt strongly that Forest Service personnel assigned to the project should be of high caliber and remain on the project for the duration and not be pulled off to take care of other forest management demands as R.E. Smith, Ranger on the Whitman National Forest, had been in 1910.

Chief Forester Graves acceded to the first request but resisted having his foresters so tightly restricted from carrying out other duties. In a letter to District Forester Chapman in Portland, Oregon, Graves wrote,

> I enclose a copy of Doctor Hopkins' plan for this project. I approve of the general plan, but think that the form of the agreement is too rigid in the matter of agreeing in advance to devote to this work certain of our men. I think a better plan would be to find out just how much money must be expended, and then arrange to put the men on the work. I fear that Doctor Hopkins' plan might result in a conflict of work on the part of their time to it. It would be better to have a man specially assigned to the whole time.

To resolve this apparent impasse, the federal bureaucracy by winter 1911 produced a thick stack of agreements (called supplements to Project Number 38), eventually signed by everybody up to the Secretary of Agriculture. The agreement very rigidly spelled out responsibilities and personnel assignments.

Henry S. Graves was new as Chief Forester of the Forest Service, having been appointed a few months before this exchange of letters from his position as dean of the Yale School of Forestry. He had been a long-time associate of Gifford Pinchot, who was dismissed as Chief Forester by President Taft in 1910. Graves' relationship with Pinchot began when he (Graves) was an undergraduate at Yale. Graves became a member of Pinchot's forestry consulting firm in 1896 and became Assistant Chief of the Division of Forestry under Pinchot in 1898. In 1900, Graves was hired as dean of the Yale School of Forestry, largely through the influence of the Pinchot family. When he replaced Pinchot as Chief Forester in early 1910, he no doubt had many more things on his mind than humoring Hopkins or worrying about a bark beetle problem in faraway Oregon. But, Graves had an ecological bent. He had seen the beginnings of the large bark beetle outbreaks in the Black Hills in 1897 and was sympathetic to the need to combat the mountain pine beetle in Oregon (Clary 1979, Graves 1965). I have copies of letters that indicate he was diplomatic and gentlemanly in his dealing with Hopkins, and this was perhaps not always easy.

The private landowners were also having difficulties. The main problem was that there were so many small landowners; they were hard to locate or they were absentee owners. There was also quite a bit of distrust among landowners, so getting signed agreements and assessments from everybody was hard. An attitude of "I'll do it if he does it" seemed to be prevalent. W.B. Turner, special agent in charge of cooperation with landowners, evidently did an excellent job of lining up agreements and support from private landowners, and a cooperative agreement for the project was signed by many parties.

In Sumpter, the economic advantage of the control work was recognized. The Sumpter Blue Mountain American editorialized on April 16, 1911, " . . . Between the logging camps and the bug hunters there is no reason why all laborers should not have employment at this place this summer."

The Sumpter Blue Mountain American reported the conclusion of the project on June 29, 1911:

> Bug Fighters Through—Government Complete [sic] Season's War on Pine Beetle. Government Officials Well Pleased With Results Accomplished.
>
> Tomorrow the government work for the season in Uncle Sam's war on the pine beetles, with which the pine forests of Eastern Oregon are infested, will have been completed. The officers in charge of the work are well pleased with the results accomplished. They report that more than 30,000 infected trees have been cut down and burned and that a larger scope of country than they anticipated when starting in the spring has been cut over. From 120 to 130 men have been employed in the work. The government men in charge of the work feel that much good will result in checking the spread of the little bug which they say is creating such havoc in the pine forests. The general impression seems to be that the beetles only attack the lodge pole or black pine [young ponderosa pine] a timber of little commercial value. This impression is erroneous. The reports show that fully as many infected yellow pines were cut down as of the black pine. Some of these yellow pines were large trees, one being noted that was 84 inches in diameter.

Burke's memoirs give a detailed account of this first forest insect control project on the west coast (fig. 9).

> The Northeast Oregon Bark Beetle Control Project
> a. Developments during the fall of 1910.
>
> The Northeastern Oregon Forest Control Project really started August 17, 1907, when at the request of Supervisor Howard O'Brien of the Imnaha (Wallowa) N.F. I examined dying lodgepole and yellow pine on the divide between Little Sheep and Big Sheep Creek near Joseph, Oregon. The mountain pine beetle was found to be the main depredator, but the western pine beetle was also present in the yellow pine. During the preceding three years, 90 to 95 percent of the lodgepole and much of the yellow pine had been killed on an area of over 100,000 acres.

H.E. Burke, PSW

Figure 9—The Northeastern Oregon Bark Beetle Control Project. First office and field station, Baker, Oregon, September 1911. (Left to right) W.B. Turner, special agent in charge of cooperation with private owners, and H.E. Burke, agent and expert in general charge of the project.

During the spring of 1910, W.C. Calder, an agent of the Wallowa Timber Company of Warren, Pennsylvania, stationed at Baker, Oregon, became alarmed at the dying yellow pine near Baker and started a movement among the private owners to have something done about it. From the Forest Service he heard of the Office of Forest Insect Investigations and started corresponding with Dr. A.D. Hopkins. Forest Ranger W.D. Edmonston of Colorado and I were ordered to Baker to represent the Bureau of Entomology at a meeting of private owners, forest officials and others interested in protecting the timber. Private owners from Baker, La Grande, Portland and Spokane were present and forest officers from Portland and Sumpter (Whitman) National Forest.

May 15, 1910, the party traveled to Anthony Creek in the Whitman National Forest and examined the infested timber. The mountain pine beetle was found to be the main depredator in both the lodgepole and the yellow pine. The western pine beetle was found in the yellow pine, especially in the larger trees, usually in the bark left unattacked by the mountain pine beetle.

May 16 the party went to Austin on the divide between the Powder and the John Day rivers.

Around Austin where the forest was mostly yellow pine the dying timber was rather scattered and mostly the work of the western pine beetle.

As a result of these meetings, Forest Assistant B.T. Harvey and Forest Ranger R.E. Smith were detailed to work under my supervision and make examinations of the Wallowa National Forest and the Whitman Forest to determine just where the infestations were and just how many trees were infested. Ranger Edmonston went to Medical Springs to examine the timber on private holdings adjacent to the Wallowa Forest.

Following these postings, I moved to Sumpter to make headquarters for the project and to demonstrate to the private owners and visiting forest officials the infesting insects and their work. Investigative trips were made through the infested areas in both the Whitman and the Wallowa Forests.

By July 1 it was determined that the infestation was widespread, involving at least 2,000,000 infested trees, and that the infesting insects were so far advanced that no effective control work could be done on the 1909-1910 infesting broods. It was decided to spend the summer studying the infestation and working with the various owners to convince them that a cooperative control project was practical against the infestation developing during the 1910 season.

Forest Ranger Edmonston was made an Agent and Expert in the Bureau of Entomology and transferred from the Forest Service. Edmonston arrived in Baker several days before May 15, 1910, and in company with the Whitman Forest official examined the infested area west of Baker and selected the Anthony Creek area as the proper one for demonstrating to the private owners the seriousness of the infestation. After the trips with the private owners and others to Anthony Creek on the 15th and to Austin on the 16th, Edmonston spent some time at Medical Springs examining private holdings on the Wallowa Forest. Later trips were made through both the Wallowa and Whitman Forests. After July 1, when it was decided that no control would be undertaken against the 1909 broods, Edmonston spent most of July and August at Sumpter and Joseph cruising infested areas. About September 1, Sumpter was made his headquarters and he cooperated with the forest officials in working up plans for fall control.

August 3, Agent W.B. Turner of the Bureau arrived from Washington, D.C., with instructions to work with the private owners of timber and help them to organize and work for an appropriation for forest insect control work in the area.

September 1, Baker was made headquarters for the project and Turner and myself located there.

September 18, various private timber owners organized the Baker Forest Protective Association and determined to undertake forest insect control.

Control work started on the Northeastern Oregon Project on October 28, 1910, with the establishment of one camp by the Baker Forest Protective Association in private timber at Cold Springs near Lockharts and one camp by the Forest Service in the Whitman National Forest on Wind Creek near Sumpter.

The primary object of these camps was the training of cruisers and foremen for the main control camps that were expected to be started in the spring of 1911 and to experiment with several methods of control.

The Association camp consisted of E.L Gerber, manager, E.J. Maberry, cruiser-foreman; four woodsmen; one cook; Agent W.B. Turner; and Expert H.E. Burke. One of the woodsmen, J.J. Sullivan, became an entomological ranger and was with the Bureau for a number of years.

Instruction started immediately with the cruising of the timber and the plotting and marking of the infested trees. After six days of cruising instruction was given in the proper methods of destroying the infesting insects.

Infested trees were felled and peeled, felled and scored on top, felled and burned. Cruising was then continued until November 12 when treatment was taken up again and continued until November 27 when a deep fall of snow caused the closing of the camp for the winter.

The Forest Service camp was composed of Ranger R.E. Smith, manager; from 2 to 13 woodsmen; one cook; and Expert W.D. Edmonston. On reporting for work on October 27, the men were instructed in the determination of insect-infested trees and in the methods of treating them by Expert Edmonston and Ranger Smith. Due to the heavier infestation, most of it in lodgepole, spotting and treating went on together. Edmonston could mark enough infested trees in a few hours to keep the crew busy treating for a day or more. The camp was closed November 19 because of heavy snow.

The Association covered 3,640 acres and treated 723 merchantable trees and 130 saplings at a cost of $806. One hundred of the trees treated were lodgepole. The Service covered 340 acres and

treated 1,120 trees; 1,056 of the trees treated were lodgepole, 61 were yellow pine, and 3 were white-barked pine. The 61 yellow pine were merchantable, but most of the others were not considered so though many of the lodgepole were large and looked like good timber.

b. Control work during the spring of 1911

I spent the winter of 1910-11 in Baker, Oregon, consulting with timber owners and working up data and plans. Edmonston stayed in Sumpter at the headquarters of the Whitman Forest to assist the forest officers. Turner returned to Washington to help present the project to the Bureau and to Congress.

February 8 and 9 Edmonston and I made a trip to the Highland Mine in the mountains east [sic] of Haines. Fifty percent of all of the lodgepole over 10 inches in diameter were found infested by the mountain pine beetle and a number of Engelmann spruce by the Engelmann spruce beetle.

During the winter Congress appropriated money for forest insect control and on March 8, $15,000 was allotted to the Whitman.[2]

Dr. Hopkins spent March 25-30 at Baker looking over the project area and talking over plans for the work. Agent Turner arrived in Baker April 1, and started at once to work up cooperation among the owners and to assist the Baker Forest Protective Association.

Control work started April 5, 1911, with the establishment of Forest Service Camp 1 on Deer Creek near Sumpter. Camp 2 was started April 6 on Anthony Creek near North Powder. These two camps were used as training camps for training foremen and cruisers for the other camps. Edmonston had charge of the control work in the field for the Bureau and Assistant Ranger Ephriam Barnes for the Forest Service.

Additional camps were started from time to time until nine camps in all were working. As soon as one area was worked, the camp was moved to another. In all, 28 camp areas were worked.

May 3 the Baker Forest Protective Association started its 1911 control work by establishing a camp on Sutton Creek under the management of L.D.W. Shelton. Small mobile camps were sent out from this camp. May 26 a camp was established at Cold Springs, but due to lack of funds this camp was turned over to the Forest Service on May 28 and became Camp 7.

Control work was continued by the Forest Service to June 30 when all of the camps were closed. The Association continued until July 10.

While the control work was in progress, my time was largely spent demonstrating and explaining the work to the various visiting owners and officials. Owners from as far away as Warren, Pennsylvania, visited the project. Among these were E.D. Wetmore, President of the Wallowa Timber Company of Warren, Pennsylvania, W.B. Sellers of the Shevlin Lumber Company, Secretary C.S. Chapman of the Oregon Forest Fire Association, State Forester Elliot of Oregon, District Forester Cecil of District 6,[3] Dr. Hopkins from April 11 to 16, and many small owners, newspaper men, etc.

Several companies sent cruisers to be instructed in the work. These men worked in the camps as regular employees. Among them were E.J. Maberry and E.L. Gerber of the Wallowa Timber Company, William Long of the Inland Lumber Company of Spokane, J.B. Larsen of the F.A. Kribs of Portland. Josef Brunner of Forest Insect Station 1 sent Lew Thomas, Hugo Kneiff and Al Wagner to assist in the work and receive training.

The organization as carried out was composed of myself in general charge for the Bureau of Entomology, Forest Supervisor Henry Ireland for the Forest Service, and Cruiser L.D.W. Shelton for the Association. The actual managers of the control work in the field were Expert W.D. Edmonston for the Bureau, Assistant Ranger Barnes for the Service, and Cruiser Shelton for the Association [figs. 10 through 13].

P.D. Sergent was engaged by Edmonston as a worker on several control projects in Colorado before coming to the Northeastern Oregon project in April 1911. He had previously been a deputy United States Marshall in Oklahoma. He was a special cruiser assistant to Edmonston until July 1911 when he was appointed as Agent. He moved with Edmonston to the station at Klamath Falls, Oregon, in the fall of 1911 and was later assigned to the station at Ashland, where he remained until November 15, 1924. He resigned to take a job as foreman for the McCloud River Lumber Company on bark beetle control projects, but after a year or so with the

[2] This was the first funding provided by Congress specifically for a forest insect control project in the West. Burke was in error on the amount; actually $25,000 was allotted.

[3] The Forest Service changed districts to regions in May 1930 (Williams 2000).

H.E. Burke, PSW

Figure 10—Examining mountain-pine-beetle-infested ponderosa pine, Miner Creek Area, Whitman National Forest, near Sumpter, Oregon, April 16, 1911. Dr. A.D. Hopkins in center with control crew.

H.E. Burke, PSW

Figure 11—Preliminary training camp. (Left to right) Woodsman Stockburger, agent and expert H.E. Burke, woodsman J.J. Sullivan, woodsman Ike Miller, cruiser-foreman E.J. Maberry, and woodsman Henkel.

company joined the Water Department of the City of Ashland.

Edmonston directed the work in the field, placing the camps and instructing the cruisers and foremen. Barnes and Shelton supplied the men, equipment and provisions and moved the camps.

Each camp was composed of one camp foreman, from one to three cruisers, three crew foremen, from 6 to 14 woodsmen, one cook and sometimes a cook's helper. The treating crews were composed of a crew foreman, two woodsmen and additional men to pile brush when that had to be done.

H.E. Burke, PSW

Figure 12—Control camp of the Baker Forest Protective Association, fall 1910.

H.E. Burke, PSW

Figure 13—Recruise of control area, July 1911. On the summit of Elkhorn Mountain are (left to right) F.C. Craighead, an unidentified agent, and P.D. Sergent.

The standard wage for a camp foreman was $3 per day and board, for a cruiser $2.75, a crew foreman $2.50, a woodsman $2.25, and a cook $75 per month.

The control work covered 109,610 acres, parts of 22 townships, along the eastern edge of the Whitman National Forest in Baker and Union counties. The Service covered 94,890 acres, about 35,000 acres being government land and 59,890 private. The Association covered 14,720 acres, all private.

Service treated 11,403 (2,914,130 board-feet) of yellow pine and 15,170 (1,295,960 board-feet) of lodgepole. The Association treated 2,265 yellow pine and 3,728 lodgepole, total board-feet 610,310.

The maximum number of trees treated per section was 571 yellow pine and 1,074 lodgepole; the

average number treated was 62 yellow pine 207 lodgepole.

The total cost of the spring control was $25,582.97 of which $2,000 was spent by the Association. To this, to get the total cost of the project, should be added the $1,681.55 spent for fall work.

The control work demonstrated conclusively that in this infestation the mountain pine beetle was the insect responsible for the damage to all species of trees—yellow pine, lodgepole pine and white-bark pine. The western pine beetle was sometimes present, but practically always under conditions, which indicated that it had attacked the tree after it had been attacked by the mountain pine beetle. The western pine beetle never was found in the young yellow pine, lodgepole pine nor white barked pine. In a few instances, the red turpentine beetle seemed to be the primary cause of the death of lodgepole.

Apparently the infestation of the mountain pine beetle first became epidemic in the lodgepole pine and then spread upward into the white bark pine and downward into the yellow pine.

In June orders were received to recommend 10 men for appointment as agents to the Bureau. A.G. Angell, C.C. Goodpasture, George Hofer, Hugo Kneiff, Ike Miller, J.D. Riggs, Phil Sergent, J.J. Sullivan, Lew Thomas and Al Wagner were recommended and appointed.

When the project closed I was ordered to take charge of Forest Insect Field Station 5 at Yreka, California, and to take with me Angell, Sullivan and Riggs. Edmonston was placed in charge of Station 6 at Baker with Goodpasture, Hofer, Miller and Sergent. Kneiff, Thomas and Wagner were ordered to report to Josef Brunner in charge of Station 1 at Columbia Falls, Montana. Agent Turner was ordered to Station 7 at Spartanburg, South Carolina. He took with him Hamilton Farnum who had been taking notes on the infesting insects during the control work. Farnum was later appointed an agent and worked for the Bureau for several months at Spartanburg and at Washington.

During July and August, Edmonston and his crew made a survey of the control area to determine the amount of new infestation that was developing. F.C. Craighead, now the chief of the Division of Forest Insect Investigations, was a student assistant for the summer and spent some of his time with this survey. This was his first experience in the forests of the Pacific Coast.

c. Some of the Cooperators

The Private Owners

W.C. Calder probably was the main personnel reason for the Northeastern Oregon Control Project. As the agent at Baker for the Wallowa Timber Company, Calder became alarmed at the dying of the timber and did something about it.

Calder was about 40 years of age in 1910, a native of the middle west, very good looking and always well dressed. His reputation was a little shady, he having been a dealer in mining stock, insurance and particularly in investing money for more or less rich widows wherein the widow usually lost the money. At the time of the project, Calder was married to the widow of Mason of Holly, Mason and Marks, the leading hardware dealers in Portland.

As agent for the timber company, it was Calder's duty to buy timber land and to look after the timber, fire protection, etc. It was the same old cut-throat game of buying your timber so you could surround an area and prevent the other fellow from getting in or having a way of getting his timber out without paying you for the privilege.

At the time of the project the only way to get timber out was by railroad and the only railroad into the timber near Baker was the Sumpter Valley. This road was to be a common carrier but it was owned by the Mormon family of Eccles of Utah. This family owned timber lands in the Baker section, at Hood River and other points so had considerable influence. Cars were often short when other owners desired to get out their timber. This caused considerable friction between the Mormons and other owners of timber which made it rather difficult to form a cooperative project among the various timber owners. Calder, in particular, was in bad because he had said a great deal about the Sumpter Valley and the Mormons.

Calder, however, was all energy and enthusiasm and with the aid of Turner did get the various owners together. The Baker Forest Protective Association was formed and 3 or 4 thousand dollars was collected. Calder also kept after the Forest Service and the Bureau until they got behind this project.

E.L. Gerber, the Association manager for the 1910 fall control work, was about 25. He came from a circus family and was born on the road. Gerber was a timber land looker for Calder and had

some cruising experience. As manager for the control work, he hired the personnel and saw that the camp was supplied and outfitted. He also did some insect spotting of infested trees. One of the men hired was J.J. Sullivan who became an entomological ranger for the Bureau.

E.J. Maberry, the cruiser-foreman for the 1910 Association control work, was also about 25 and a native of southern Idaho where his father was a horse raiser. Maberry seemed to know his work well having had cruising experience with the Warren Timber Interests in New Mexico, as well as in Oregon. While Gerber was strictly a Calder man, Maberry had been trained by Shelton and was more of a Shelton man. In a way it looked as though the Company was playing safe and had Shelton keeping an eye on Calder. Maberry worked under Shelton in the 1911 control work carried on by the Association.

L.D.W. Shelton, manager of the 1911 Association control work, was about 65 at the time of the project. He was an experienced surveyor and timber cruiser and had made the original surveys for parts of western Washington. The town of Shelton on Puget Sound was named for him. Shelton was a good field manager but did not think much of Calder, the Bureau, or the Forest Service so ran the control more or less on his own.

Mr. E.D. Wetmore, president of the Wallowa Timber Company, was about 50 and a man of wide business interests. He was a good backer of the project and reported to Washington that he was well satisfied with the way the control was conducted.

The Forest Service

At the time the project started in 1910, C.S. Chapman was the District Forester of District 6 of which the Whitman and the Wallowa Forests were a part. Chapman was a trained forester who had considerable training and experience in various parts of the United States. He was a good cooperator and did all that he could to make the work a success. Later he became the secretary of the Oregon Forest Fire Association and then worked for the Weyerhaeuser Timber Company in Washington State until his death a few years ago.

George H. Cecil was the Associate District Forester of District 6 at the time the project started. He visited the project several times, but was not as good a cooperator as Chapman and did not favor the control work. Cecil followed Chapman as District Forester. Later he became Supervisor of the Angeles Forest in District 5 and then forester for the Los Angeles Chamber of Commerce which position I believe he still holds.

Henry Ireland was supervisor of the Whitman National Forest with headquarters in Sumpter. Ireland was about 50 years of age and one of the old Interior Department political appointees. He was a carpenter by trade in west-central Oregon and when appointed fought forest fires by riding up to the fire on a horse with his rifle on his shoulder and watching the timber burn. This was the usual method of forest fire fighting in those days. Soon after the start of the century, however, methods improved and forestry became a profession. Ireland made good and soon rose to the position of supervisor of the Whitman National Forest which contained several areas of very good yellow pine accessible to a good market. Ireland was a good cooperator, but did use the bark beetle infestation to increase his timber sales. The more receipts the more important the position. He remained the supervisor of the Whitman until his death in 1918.

The forest assistant on the Whitman was M.L. Merritt. Merritt was a forestry graduate of the Iowa State College and had been in the Philippine Forestry Service. He was much interested in the insect work, but became seriously ill and was in the hospital most of the time during the project. Merritt afterward transferred to Alaska and later became assistant regional forester in charge of operation for Region 6.

Three of the rangers on the Whitman were R.E. (Kan) Smith, Ephraim Barnes and H.B. Rankin. Smith was a Kansas boy who had joined the Service without any previous forestry experience. He was a serious student, however, and had taken several short courses in forestry. He made the original insect survey on the Whitman and had charge of the 1910 control work for the Service. He did not like control work so was transferred to other work in 1911. Later he transferred to Alaska and was there for a number of years.

Barnes was a young middle westerner, also without technical forestry training. He was made manager of the 1911 control work for the Service, but in the middle of it was promoted to be Supervisor of the Ochoco Forest with headquarters at Prineville in central Oregon. Afterwards he was made supervisor of the Minam Forest with headquarters at Baker. Later, about 1918, he left the Service.

Rankin was an older man who had been a railroad station agent before joining the Service. He

saw something of the infestation and the control work but was transferred to western Oregon where he became Supervisor of the Siuslaw Forest.

W.T. Andrews, logging engineer for the District, spent some time in the infested areas. He did not think much of control work and believed that the best plan was to sell the timber before the insects could kill it.

In spite of these colorful characters, the Northeastern Oregon project ended on an up beat with apparently some success in reducing the amount of timber being killed by bark beetles. But, perhaps the most important outcome was the demonstration that private timber owners, the Forest Service, and the Bureau of Entomology could all work together toward a common goal and, in the process, a model for future insect control projects was established.

We shall see whether future projects would be as successful for Burke and the Bureau, but first John Miller needs to be introduced. He began his career as a forest entomologist under Hopkins just as the Northeastern Oregon project concluded. He arrived via a different route, however, starting as a Forest Service Ranger with an interest in forest insects and mildly defying some of Hopkins' theories as applied to a new bark beetle outbreak in 1911 on the Klamath National Forest near Yreka, California. Hopkins may have been taken aback by this upstart, but a forester with a university degree and a keen interest in forest insect biology and forest ecology was just the sort of professional needed in his expanding organization. The fact that Miller was not overly impressed by "The Father of American Forest Entomology" might have also worked in his favor. Hopkins seemed to appreciate critical minds unless they wandered too far from his set ideas. At any rate, he saw something in Miller he liked because in 1911 he had the young ranger transferred to the Bureau of Entomology and put him in charge of the next major bark beetle control project on the Klamath National Forest. Burke and Miller were about to be long-term colleagues and friends, and forest entomology in the West was better because of their association.

Chapter 5: John Martin Miller Family History and Education—the Forest Service Beckons

John Miller did not come into the world in as exciting a fashion as Burke did (during an Indian uprising), but he also descended from pioneer farming ancestors who moved west with the frontier. Miller's mother and father moved from Pennsylvania to Ohio, then to Illinois, and as the Mississippi valley got crowded for them they continued west to California. John's brother said "they sometimes talked of the Sandwich Islands" (Miller 1943). John's son described his birth and what is known of his early years; it is recounted in a second family history assembled in the 1960s (Miller N.d.b).

> John Martin Miller was born August 31, 1882 at the Miller Ranch called The River Bend Place. This was about one mile east of the town of Parlier, in Fresno County, California. He was the youngest of four children born to Martin Miller and his wife, Ardalissa Dryer Miller. His first five years of boyhood were spent at the River Bend Place. In the fall of 1887 his parents endeavored to sell the ranch and moved to Los Angeles at a location near the present Prospect Park on the Los Angeles River. Two years later, in the fall of 1889, the Miller family returned north to the River Bend ranch, the sale having fallen through. The family had suffered economic reverses in the Los Angeles area. John would have reached school age, but it is uncertain if he actually began elementary school in the Los Angeles area.
>
> His parents again took up farming at the River Bend ranch and John progressed through elementary grades at the River Bend School which was a short distance from the family home. In 1896, he was ready for secondary (high) school. There were no such schools at Parlier or Reedley, so John was enrolled at Selma High School. Selma was a small town on the Southern Pacific main line about eight miles southwest of Parlier. He completed high school in the year 1900.

As a boy growing up on a ranch, Miller had chores and responsibilities from an early age. He was also fortunate to be raised in a healthy environment and close-knit family. His skill in handling horses and camping experiences gave him an instant advantage when he began working for the Forest Service in later years. There was no question about Miller continuing his education at the college level because the family valued education as well as hard work. He entered Stanford University in 1902 and majored in Biological Sciences. He particularly enjoyed entomology taught by Professor R.W. Doane, a noted entomologist. Probably because of his outdoor upbringing, he and a few other students formed a forestry club.

Miller dropped out of school in the winter of 1907 and worked for the Water Department of Pacific Grove, California. He must have been casting about for other employment opportunities at the time. The following excerpt from an April 26, 1907, letter to his sweetheart, Miss Bessie Brose in Parlier, California, indicates that the U.S. Forest Service, Sierra National Forest made a job offer.[1]

Although Miller's letters were meant as love letters to his fiancé and they are not included in their entirety here, they are significant historical accounts of the everyday life of a pioneer ranger in the U.S. Forest Service.

John's first letter of the period begins with an apology for not writing sooner. This is how he explains his tardiness.

April 26, 1907

> It all happened about this way:
>
> I am about to leave Pacific Grove, and I have had so many affairs to straighten out here that time has been a pretty scarce article with me. I have had a chance to take a Government position on one of the Sierra forest reserves and I have about decided to take it up. I am going to start next Monday for North Fork. I have had a hard time of it coming to a decision. I will be disappointed in not getting home this summer in more ways than one and I hope that you will not think me foolish when I say that one of the most important of these reasons concerns you.
>
> However if I keep on in the Forestry Service, the experience of this summer will be just what I need and I can hardly afford to let it go. When you hear from me again I hope to be able to tell you more about this.

[1] Miller and Bessie Brose carried out a regular correspondence for the next 3 years until they were married. The Miller family has kindly allowed use of parts of the letters.

Evidently Miller decided to give a job in the Forest Service a try, for his next letter to Bessie several weeks later show him on the job in camp.

May 19, 1907

My Dear Bessie:

I hope that you will pardon me for using a lead pencil, but it is the only accommodation that the camp affords. I reached North Fork Friday evening and found orders awaiting me to report at Sugar Pine with the technical Assistant and two other Rangers. So it was saddle up early the next morning and take the trail. It was an all day ride and I enjoyed it immensely. There are so many pretty places about the mountains.

We came on past Sugar Pine to the Rangers Camp on the old Miami Mill Site. We are in an old log cabin that has a big stone fireplace in one end and no windows or doors. We have a big open meadow out in front of the house where we pasture our horses. It is decidedly cold at night. The meadow was white with frost this morning and the snow is only a few miles away.

Everything is much later here than it is in the valley. The trees are just beginning to leave out and the willows are still in catkins. I have found a few snow plants and there is plenty of dog wood in blossom. I wish I could send you some of the wild flowers that we have here. There is certainly plenty to spare.

I am marking out timber for the mills to cut and enjoy the work although I haven't very much of it yet. Yesterday we had to lay off and take our Sunday as part of party did not get here, so we had to start in work today.

I did not get to see the Supervisor so can't tell yet whether I can get a leave of absence next month or not. Write to me next time at North Fork, Cal. That will be my permanent address while on this work.

Lovingly yours, John

I will digress a bit and describe what John Miller was getting into being a field employee of the U.S. Forest Service. As starters, Miller probably took the job because he loved the outdoors (from his early letters he described long walks to see scenery and the cypress trees on the Monterey Peninsula). The Sierra National Forest was also directly east of his family home ranch and that of the Brose family, thus he would be closer to his future wife. Miller may not have been fully aware of how physically demanding the field work in this new agency, the U.S. Forest Service, could be. The Forest Service was officially only 2 years old in 1907. The history of the formation of the U.S. Forest Service in 1905 from the original Division of Forestry formed in 1881 in the Department of Agriculture is well documented by the first Chief, Gifford Pinchot, and others (Guthrie 1995, Joslin 1999, Pinchot 1947).

As the following letters will illustrate, John Miller was the model Forest Ranger of these first years of the organization's existence. Rangers had to know how to work hard, (dawn to dark at least 6 days a week), ride, shoe horses, pack animals, rope, shoot, build fences and cabins, and somehow also have enough education to read, write, and do at least rudimentary arithmetic for timber cruising and sales and land surveys. In addition, honesty, integrity, and loyalty to the Forest Service were demanded. Needless to say, many of these early rangers were not college educated. They were mostly farmers, ranchers, trappers, hunters, and other outdoorsmen having some secondary school education. Miller was rare, along with a few others, in having 3 years of biology from Stanford University. He probably had to prove himself more than once with his less educated and less socially polished coworkers.

As to the other side of the coin, his formal education resulted in rapid promotion in the Forest Service when he obtained his civil service appointment. Probably because of his university zoology courses, he could recognize and interpret natural processes, like tree killing by bark beetles. He became a lifelong researcher of tree-killing bark beetles of the genus *Dendroctonus*. To the Forest Service's credit, they recognized his unique talents and, as we shall see, eventually detailed him to emerging forest insect problems. Down the road in this history we shall see how he came to Dr. Hopkins' attention (and ire) and eventually an appointment in the Bureau of Entomology under H.E. Burke. Miller's letters to Bessie continue to describe his life in the early U.S. Forest Service.

June 28, 1907

My Dear Bessie:

I don't know when this letter will reach you but I will write now and trust that you will be

J.M. Miller family

Figure 14—Mrs. Shinn at their cabin, North Fork, Sierra National Forest, ca. 1909.

satisfied with news that is several weeks old. I made the trip up here without any serious mishaps although I nearly lost the pack mule on the cable bridge at the San Joaquin River.

It was desperately hot through the foot hills. I camped the first night about twenty miles above Centerville. I reached the San Joaquin River about six o'clock the following evening and got my supper at the Light and Power company's power plant and then climbed out of the Canyon up to the Supervisor's headquarters. I had a ten mile trail and 2000 feet to climb and I got there about 10 o'clock p.m. I found the place deserted as everybody had gone up to the upper camp. The next day it was good and hot at North Fork. I climbed up 3000 feet more to Shinn's[2] upper camp and found it cold enough in the evening to enjoy a fire. I am located on a pretty little meadow with big sugar pine trees all about it [fig. 14].

[2] Charles T. Shinn arrived in North Fork in 1902 as the Superintendent of the Sierra Forest Reserve. When the Reserves became National Forests administered by the U.S. Forest Service in 1905, Shinn was appointed the Forest Supervisor of the Sierra National Forest. He held this post until he resigned in 1911 because of increasing deafness. His wife, Julia, was appointed clerk of the Sierra Forest in 1907, and served several more supervisors until 1923. In her role as clerk and then chief clerk of the Sierra National Forest, she became more famous than her husband (Pendergrass 1985).

Shaver, June 30, 1907

I did not get this letter finished as I was suddenly called out to go back to the South of the San Joaquin River. I am outfitting now at Shaver and start back on a thirty mile trail into the mountains. I will have to go back to snow.

Lovingly, John

Miller made time to write every several days, and given the circumstances he did quite well as a correspondent.

July 7, 1907

Sunday in camp! Little there is to remind one of Sunday at home unless it is the fact that we are not at work. I am thirty miles from a house, fifty miles from a church over a hundred miles from you. We certainly hit the wilderness on this trip and had to come through snow and ice to get here. We left Shaver last Monday morning started back on the Mono Trail with saddle horses and pack outfits. By noon we were in the snow but left it above us that afternoon as we went down into the Canyon of Big Creek. Our horses had to swim to cross the creek. That night we camped on other side of the canyon just at the edge of the snow line. And cold!—Oh my!!!

The next morning we went through Kaiser Pass where at an altitude of ten thousand feet we crossed snow drifts from six to ten feet deep. Then we came on down into the canyon of the San Joaquin and here we have been ever since. This altitude here is only about five thousand feet and it is a good deal warmer. We are camped right on the river which is high with water just off of the melting snow and goes roaring by in a regular torrent.

When we came through Kaiser Pass it was hard to realize that it was the middle of summer and that down on the plains it was hot and dry and dusty. The grass was just beginning to grow on the meadows and the willows still had catkins on them and the leaves were only starting. As yet we could only find a few wild flowers. Down here on the river the snow leaves early and it is a good deal warmer and dryer. Every evening we go fishing and get all the trout we can eat for breakfast.

The canyon walls rise on either side of the river in rock cliffs from five hundred to a thousand feet high and from there back to the summits the canyon walls are timbered. On this little flat down by the river there is only yellow pine and sage brush.

Miller's letters demonstrated his keen powers of observation and ability to describe what he sees.

Supervisors Upper Camp, July 26, 1907

My Dear Bessie:

I believe that explanations are in order and as usual I hardly know where to begin. I have almost forgotten whether two or three Sundays have gone by without my writing to you. Your last two letters were both received on the same day and as I had not heard from you for nearly a month (not a word since I left home) I was just a little more than pleased to get them. I might as well tell you something that I did not tell my folks and that is that I took sick on the San Joaquin river trip and was hardly able to get back to Shaver. I think that I wrote to you one Sunday while back on the river. I took sick the following week some time. I seemed to have neuralgia or something of the kind and could not eat anything for four or five days.

Sunday noon we started back again on the trail. I was just about able to hang onto the saddle, but we got nearly to the snow line and camped. I was feeling a good deal better the next morning and we made it through to Shaver. From Shaver I got sent back to Bench Meadow. This is about a thousand feet above Shaver Lake and is one of the prettiest camps I have found in the mountains. We could look down over the lake and clear out onto the plains. I camped with one other ranger. We took life easy and I soon began to feel a great deal better. Every night we had a little frost and it was so cold that we enjoyed setting around a rousing fire in the evening and we slept under three blankets, two comforts and a canvas. During the day we could look out over the valley and fairly see the heat. We could not see much of the plains as they were hidden in a sort of brown haze. I would just as soon have stayed at Bench Meadow the rest of the summer but I had to come over to North Fork to take the Forest Rangers' examination there July 23 and 24.

So I left Shaver last Sunday for warmer regions. We came down the old Italian Bar Trail and crossed the San Joaquin river again on the cable bridge. We got to North Fork again in the evening and I had to stay there three days to take the examination. I don't know whether I passed or not and don't care very much. Our papers had to go to Washington and it will be some time before we hear from them. There were ten altogether in the class. As soon as I got through the Supervisor sent me up to his upper camp. I left North Fork yesterday morning and made the climb up the hill by noon. It is certainly surprising what a difference ten miles makes in the climate up here. It is so cool that one keeps close to the fire at night and wears his coat in the morning. I am on the invalid list again today as I hurt my knee yesterday trying to shoe my saddle horse. I think I will be able to get around again tomorrow.

Well, I think I have told you enough about myself as it is certainly an uninteresting subject. I can sympathize with you so far as the hot weather is concerned as I still remember last summer. I wish you were up here in the pines for a while; you would certainly get cooled off. Sometime we will come up here every summer and listen to the sound of the wind in the big pines and the murmur of the water in the mountain streams—now please don't laugh at this, it's serious.

By this time Miller, it seems, realized he had found his calling. His prediction about sharing the beauty of the high sierra in summer with Bessie would come true several years later after they married. Also the 2-day Forest Rangers examination mentioned in the letter was no trivial test. It included both practical (horse packing, horsemanship, surveying, timber cruising, etc.), as well as a written exam covering rules and regulations, and mathematical problems relating to timber measurements and scaling.

Nowhere in Particular, Aug. 4, 1907

Dearest Bessie:

It seems like a long time between letters and I guess that you have reason to think so too. I believe that I told you in my last letter that I was going to do better and be a little more prompt. As this is Sunday again and I have my own time, I will do the best I can.

It is Sunday afternoon but so different from a Sunday at home that it reminds me of Kipling's poem "Christmas in India." I am still at the upper camp doing nothing in particular. This morning I worked about the office for a while and then stayed around and helped cook dinner. This afternoon I felt like I wanted to get away so I saddled up and started out to see if I could find a little of "Nature's Solitude." There is plenty of it around here and I did not have to go very far to find it. I rode down an old mill road through some groves of splendid big sugar pines and finally came to an old deserted mill site. The mill burnt down some years ago but

some of the old cabins are still standing. In some ways the place suggests Goldsmith's Deserted Village. Back of the mill is a little meadow with big pines (I am in the shade of one now) all around it as green as a lawn and covered with white and yellow flowers. I know if you were here you would call the place pretty. But you see I am all alone, or rather, my saddle horse (out feeding on the meadow) is all the company I have.

Well, I don't think I will enlarge much more on the beauties of this place as they have to be seen to be appreciated. I would give a good deal to be down in the valley, for about a day and get some fruit to eat. I have almost forgotten what peaches look like. We will begin to have a few ripe gooseberries and elderberries after a while, but down in the valley we wouldn't think of eating such things.

We are still having plenty of excitement up at the camp. Mr. Pinchot, the Chief Forester from Washington, came up here last Saturday with the Chief of the Survey and a few more big men from Washington to stay a few weeks. The Secretary of Agriculture is expected in a few days. Last Tuesday I was sent over to Shaver again to take over Mr. Page, a writer from the World's Work who is out here gathering material on Forest Reserves. I came back by the Italian Bar on the San Joaquin River and had a little taste of hot weather. I was glad enough to get back here in the pines again.

I expect I had better be finding my way back to camp or I will be too late to get anything to eat.

Love from John

Letters were less frequent now that the field season was winding down. Instead of once a week they were now monthly.

Billy Brown Meadow, September 3, 1907

Changing the subject—I would like to pick grapes myself for a day or so just to get filled up on them. I have had just one bunch of grapes this summer and they made me think of home. I certainly do get hungry for fruit but have to make up for it eating venison.

I found it warm enough down at North Fork yesterday morning. I climbed the hill and got up here about three o'clock. Then it started in to rain and rained some during the night. We got our tent up just in time and are now prepared to let the rain come down as hard as it wants to.

I don't see much show now for getting home before December 1st. The Foresters Convention is to be held at North Fork instead of Fresno as originally planned. I have a notion to "jump my job" and come home anyway.

Tuesday, October 1, 1907

I am still up at Billy Brown Meadow herding shake makers. I would like the job alright if it wasn't quite so lonesome. There will be another man in to help me before long, but I can't tell how soon.

The deer season is still on and I have been out hunting for several mornings. I missed a shot at an old buck yesterday and I have been feeling pretty bad about it ever since. One of the shake makers captured a bear here last week. The coyotes howl around my camp every night and make it seem lonesome and dismal indeed.

Last week it was warmer than usual and I was able to stay around camp without freezing to death, but last night it was so cold I could hardly sleep. There was ice on the spring when I went to get the water this morning.

By late fall, Miller was again enrolled at Stanford, but there were no known letters until April. He did not say why he returned to the university. He might not have passed the Ranger examination and realized he could profit by obtaining a university degree.

April 13, 1908.

As usually happens about this time of year, my university work is piling up so that I can hardly see my way clear ahead. The final examination begins three weeks from next Thursday and will be over the following Wednesday. I will have to stay over until the last day to take them.

I am becoming perfectly heathenish too. I did not go to church this morning. My only excuse is that I stayed at home to work on another Journal Club article that I have to give next Tuesday. It is not altogether my fault that it happened this way it did. I selected an article some time ago on ants and had it partly worked up. In the mean time though another member of the class (there are only four in the class) selected the same article and arranged with the Prof to give it two weeks from last Tuesday. So I had to select another which I did last Friday and began work on it Friday night. I worked on it all last night and all this morning and I think I can finish it by working tonight and Monday night. The subject of it is on the artificial fertilization of starfish eggs. That doesn't sound very interesting,

I know, although I find it intensely interesting after I get started on the subject. A scientist in the East by a series of experiments used certain chemicals and the influence of heat to start the development of unfertilized eggs. It was supposed that these eggs would never develop except under the fertilization of the male so his results are quite contrary to the commonly accepted laws of biology. But I won't bore you any more with this kind of talk, as I know that you are not interested.

I think I have my plans pretty well made for the next year unless something new turns up to upset them. I expect to come back here and do one year of post graduate work. One reason why I made up my mind to do this is that I had the place of assistant in the entomology laboratory offered to me which will take care of the financial factor in my staying here. And besides it will give me a chance to do some work and possibly get an advanced degree which is something else that I very much want. I will go back to the mountains for the summer as I have agreed to report at North Fork by the 20th of May. I can make this fairly easy as the senior class have decided to cut out their commencement exercises. This is on account of the recent trouble we had with the student affairs committee. Thirty members of the class were "fired" so the class thought that they ought to choose some appropriate means of their grief.

Miller obtained his Bachelor of Arts degree in Zoology in May, then was off to the Sierra National Forest for another summer and fall of work as a field ranger. His next letter was written after he returned to work in May 1908.

Sunday May 26, 1908

But to get back to what I started to do which is to write this letter. I left home last Monday morning on horseback en route to North Fork. I supposed that I would have to make the trip alone, but just as I was starting, Dr. Acers brother (whom I knew at Stanford) rode up on the Doctor's horse. He wanted to ride along with me and before we had gone very far, he decided that he would like to go clear through to North Fork. So we stopped at the first ranch we came to and he telephoned to his brother that he was going and came on with me.

We got to Humphrey's station after dark but they refused to take in anyone so we had to camp out. It rained during the night and I had a good canvas so we didn't get particularly wet. The next day was cool and pleasant so we made good time and got to North Fork that evening.

I seem to have suffered somewhat from the change in climate. The first two days that I was here I wasn't able to do anything much but work around the office. Acker went up to Shuteye and started for Reedley Thursday noon. Friday I took some contracts up to the shake camp at Shuteye and came back yesterday. The trip up into the cold gave me a good deal of an appetite, and I feel all right now. I am about rid of my cold at last!

It certainly seemed good to get back into the big trees and the high altitudes once more. I had to cross some snow drifts that were three or four feet deep. The air feels fine and the odor of the sugar pines puts new life into the blood. The snow was fast disappearing and then there are the snow plants. I wish I could send you one. They are the most peculiar sort of a flower. Some times they come up where the snow is very thin, which makes them very conspicuous as they are bright scarlet in color.

I was in hopes that I would get to put in the summer near here or at least get to go back to the Shuteye camp, but it seems as though I have developed an undue amount of popularity while I was away and I am wanted now in a number of places. Mr. Shinn's first plan was to keep me at the office as a sort of assistant clerk, but he says that more pay involves more responsibility so he is going to put me in as scaler at Shaver. In some ways it is one of the best jobs on the reserve. One has an excellent opportunity to learn how to scale timber and if the work was such as it was last year, it only takes about three hours per day. I don't know whether you know what scaling is, but it consists in calculating the board feet in each log that is bought of the Government by the mill company. It consists mostly in book keeping but it is much simpler. I will probably have to be going down to Shaver about the last of this week and the mill there expects to open up about the first of June. The scaler is in charge of the Government end of the cutting—hence the responsibility.

It was quite warm down here at North Fork yesterday and warmer yet today. Still the nights are always cold. It never gets hot like it does down on the plains. I think I like the North Fork climate better than any I have found yet.

Now I will have to go and catch my horse and take this letter down to the P.O. so that it will get away on the stage in the morning. I don't feel like

J.M. Miller family

Figure 15—Bretz Mill, Shaver Lake, 1908.

writing a decent letter this afternoon anyhow. I wish so much more that I were down at Parlier.

Yours lovingly, John

Miller's letters about his Forest Service life and duties are classic history of the fieldwork of that era. They are worth detailing here because they also show how this background helped shape his future with the Bureau of Entomology.

Shaver, Sunday afternoon, 06/10/08

My Dearest:

I have been trying all day to write to you but so far have failed. I intended to write sometime during the week but various things came up to interfere. I guess I will have to tell you something of my wanderings during the past week so you can understand what my difficulties were.

I left North Fork last Monday morning in company with the Technical Assistant Tomkins, an assistant State Forester named Smith, and Ranger Noddin. I had been about sick for the past two or three days, due I think to the board I was getting at the North Fork Hotel. I haven't tried to batch any since I have been here this summer. I soon began to feel better after I made the trip and it was so cold at Shaver that it seemed as though winter was starting in again. Cold frost and ice every night. I could not begin scaling as the Lumber Company were behind with their logging. So the first part of the week I went with the party up to McRanger's Mill where we surveyed and estimated timber for two days. Then we went down to Petersen's Mill about 15 miles below Shaver where we did two days more of surveying and estimating. Friday I went over to Camp Seven, and stayed, but they will not begin to log until tomorrow [fig. 15].

Camp Seven is about four or five miles from Shaver. The place where they are cutting Government Timber is on the rim of Blue Canyon. I will have to stay here for three or four weeks yet until the sale is completed. Then I don't know where I will be, but I have an idea that Mr. Shinn will want me back at North Fork.

Living in a logging camp is something awful, but it is about the only thing I can do so I have to board there. I hope soon to have a government tent to myself, which will be much more pleasant. They have "Chinamen" for cooks at camp seven where about 148 men stay . . . .

This morning I went down to Shaver and rode by the old Sage Mill. It is about a mile and one half from the camp and it has a sort of attraction for me, as it was the first place I ever camped in the mountains. I was there just ten years ago this summer. It was that camp trip that gave me such a liking for the mountains, and I have always wanted to go back ever since. The place has changed decidedly. The Mill, of course, has gone, but some of the old cabins still stand. The timber has all been cut away and it makes the country look barren in places. I did not get back from Shaver until four o'clock, and that is why I am writing at this late date.

I don't remember whether I told you in my last letter that at last I have an A.B. and sheepskin. I received my study card about ten days ago and I drew a straight + on all my sixteen hours of credit which brought me up to 120 necessary for graduation. Then I had a notice that my name was read off at Commencement with the rest of the graduates. So, I guess I can get my diploma whenever I want to claim it.

It doesn't mean very much but then you know there is a certain amount of satisfaction in knowing that I have earned it. It is one thing that I have done that stands completed and cannot be taken away from or added on to. And then it helps some too in almost any kind of work that one goes into both in the standing that one gains by it among other men and the training helps one to get hold of the general principles of any new proposition readily.

But, at the same time I know that College training alone can never carry one successfully through life and whatever I can do in the way of a vocation will depend entirely on my own efforts. I am still pretty much at sea about the kind of work that I can do to the best advantage. I am determined to go back to school again next year and

work out a high school teacher's certificate. I started out to do that a few years ago, and I always like to accomplish what I start out to do. I can get another leave of absence here without losing my standing in the Forest Service. Then, next Spring, I am going to try the technical examination in forestry and if I can pass that and get a high school certificate, I will have two lines of work that I can depend on for a living. I wish I could combine the two and teach forestry!

But, why ramble on this way! It probably doesn't interest you particularly. The reason that I happened to get started on the subject was probably due to a talk that I had with the assistant state forester Smith. He advised me strongly to try the technical examination. Said that if I could pass the technical exam after the experience I have had in the ranger's work, my chances for advancement in the U.S. Forest Service would be excellent.

Miller was beginning to have some doubts about a permanent career in the Forest Service, but perhaps some of this was due to rough camp life and loneliness.

Sunday afternoon, 06/19/08

I have been scaling for a week now and so far I have found that it is pretty much of a lazy man's job. I have to go to work at half past six in the morning and quit at half past five in the evening, but the work consists in sitting around in the shade most of the time. Nothing to do only scale a few logs once in a while as they are pulled into the chutes. I don't think that I care very much for the job but it won't last more than two or three weeks more although I shall probably have to stay here for a month yet before the cutting is finished.

I suppose that your school is over now for the summer and I know what a feeling of relief it will be tomorrow morning to know that you don't have to go back to the round of studies again. I know that I was glad enough myself when I got out of school in May, and I had only been there for three or four months. Now I know that I can expect your letters regularly from now on although I have had little reason to complain on that score recently.

I am glad to know that you are coming to the mountains and you can just bet that you will see me if you are any place near Shaver. I hope you will let me know when you are planning to start so that I can know when to expect you. I am sure that you will like it up here if you find a pleasant place to camp.

I wish that I could get a leave while you are up here but I suppose that I will have to stay on duty. Anyhow I will have my evenings and Sundays.

Monday evening:

As you see, I did not get this letter finished last night. The candle burned out once so I had to give it up and besides I was somewhat sleepy. I am sorry that I did not get it mailed today for I know that letters are long enough on the road when they are mailed here. This letter ought to get the Wednesday stage down and if nothing delays it should reach you Thursday—a little late, I know.

How do you like the way my new fountain pen writes? The pen I am sure is much better than the writer. I lost my own pen the first day that I scaled so I sent into headquarters and they sent me one of the Forest Service pens. It works very well but has a stub point which I don't like. But back in this country one has to take what they can get and be thankful they have it.

Yesterday and today have been quite cool compared with some days last week. The cold weather I hope is over for this summer. Friday and Saturday it was quite warm out in the sun but it is always cool in the shade.

I don't like to stay at a lumber camp as well as I did camping out at Shuteye last summer. This country is not so pretty anyway. It was once, but it is being rapidly ruined by the lumber men. The F.F. and Irr. Co. cut down every stick of merchantable timber on their land and then bury the slashing so there is little left but a barren waste when they are through.

Somehow I don't seem able to write an interesting or a concentrated letter tonight. I am afraid that I will have to give it up. The camp fire outside the tent is burning low; it is after nine o'clock so I think I will turn in.

Wie immer, Hans

Wednesday afternoon, 7/5/08

My Dear Bess:

In as much as my end of our correspondence has been somewhat disjointed and intermittent of late, I guess it is up to me to explain. I did not write last Sunday but I think that you have heard from me since then. I moved up to MacKenzie's Mill yesterday and I did my first day's work today; that is if one has the heart to call it work. I think that I put in about an hour and a half altogether in actual time.

J.M. Miller family

Figure 16—Miller (right) and unknown person scaling sugar pine at Bretz Mill, 1908.

> The reason for my coming over here I think was due to the fact a certain amount of trouble has arisen between the Government and the company on this particular timber sale. The rangers and the company men have been at sword's point for some time. It was finally decided that the best way to settle the friction would be to put in new men altogether and so it happened to fall to my lot to be one of them.
>
> It also fell to my lot to be scaler and I seem to have won quite a home [fig. 16]. We scale the logs in the rollway of the mill and as they accumulate there before they are taken on the saw, we only have to scale about three or four times per day. It is extremely "easy" work but it gives me an excellent chance to study forestry and lumbering and I am going to try and make the most of it.
>
> I don't suppose that I will see North Fork again this summer until I leave to go home, although one can never tell what is going to happen to him when he is on this work. I think I will like it here very well. We have a good cabin to stay in, a good place to board and plenty of time to read and study. I do hope that your plans for coming to Shaver will carry through. I think that we can surely have some good times up here "boating on Watoke lake" only it will be Shaver lake this time. It is a good deal of satisfaction to have Roscoe up here for I feel like I can see some one from home occasionally. We are planning a trip back to Dinkey Creek for the Fourth of July, where we can see the Big Trees and go fishing. We expect to go up Saturday and come back Sunday. I wish that you could go along.
>
> Your letter came in on the wagon this afternoon; a little bit late as it went up to camp 7 and back. I will have to give you another address for my mail. Instead of camp 7, just put on MacKenzie's No. 7. I have to be particular as there is a J.W. Miller here in the U.S. Geological Survey. I got some of his mail today by mistake. Miller is an extremely common name as you will learn some day after you have adopted it.

Miller wrote again 2 days later. His easy work as a scaler allowed more time for writing and probably his self study of forestry subjects. However, it was not all work and no play for the rangers. Miller was a sportsman, and living where he could fish and hunt was a definite plus for him.

> 7/7/08
>
> I might as well tell you something about the trip. I have been waiting to go fishing all this spring and as we had two holidays coming together, the fourth of July I began to plan a trip for that day two weeks ago. Another ranger and myself talked of going back to Dinkey Creek but we finally gave that up owing to the reports we had heard that there are very few fish in Dinkey Creek. After Roscoe came up we planned to go back to the Big Trees or some place the Fourth, but we did not get our plans completed until just the day before. We finally made out our party consisting of the ranger I am staying with now, Roscoe, and me. I got through work about four o'clock Friday evening and we took the trail then and rode over the ridge to Tamarack Creek where we camped about dark that evening. The next morning we tried fishing in Tamarack Creek but the fish were rather small and did not bite readily so we packed up about nine o'clock in the morning and started for Red Mountain Lake. Red Mountain is one of the higher peaks of the Sierras about 10,000 ft. in altitude and about thirty miles back to Shaver. It is in a region where a number of small mountain lakes abound. We had three saddle horses and one pack mule in our train so we had to look for a camping place where horse feed would be plentiful.
>
> We reached Red Mountain Lake about noon, but we found feed so scarce that we kept on and

tried Coyote Lake which was about two miles further back. This is a beautiful little lake, about a mile in length lying at the foot of a big granite mountain. Snow was still lying about the edges of this lake, and owing to the altitude and the cold feed was very scarce. We decided to go down then to Big Creek and camp on Long Meadows. These were also quite a distance below Coyote Lake and consequently some warmer. Our first view of these meadows convinced us that we had good fishing and good horse feed, so we made camp, cooked some dinner and about three o'clock started down the creek with pole and line. So few tourists get back into this country that the fishing is but little molested. We had about as good sport as I have ever enjoyed. My brother ranger is an expert fisherman and caught the limit. We returned to camp with a catch of about seventy and proceeded to fill up on trout. I had all I could eat for once.

We tried our luck again the next morning but the fish did not bite nearly so well. About ten o'clock we packed out of camp again and decided to go home by another trail. We were not so very sorry to leave the meadows as we were bidding farewell at the same time to our friends the mosquitoes. It may seem strange to hear of mosquitoes in the high mountains, but they are quite in keeping with the size of the trees. They are the biggest and most bloodthirsty I have ever seen and they fill the air in clouds. Unless one keeps in fire smoke or wears a veil it is almost impossible to enjoy life on account of them. My face and hands were sore and swollen on account of the many punctures I received.

We climbed up to the head of Dinkey Creek and about noon passed Dinkey Lake. This lake is not quite so large as Coyote and is set in a little valley at the foot of the Three Sisters—three needle like granite spires which have snow on their flanks most of the year. From here we worked down the canyon of Dinkey Creek. This is a rock walled gorge and the trail is rough and dangerous in places. We came out over Bald Mountain down to Markwood Meadow and reached camp 7 in time for supper. I went around to Sulfur meadow and stayed with Roscoe last night. Got up at four o'clock this morning and walked up to MacKenzie's Mill in time for breakfast.

Mosquitoes! The bane of the forest worker.

July ?

My Dearest Bess:

I believe I said that I would write the middle of this week and as this is Wednesday morning I guess that it is about time for me to begin. There has not very much happened to relate since I wrote last, except a fire that broke out in the woods here Monday night. I haven't had very much experience yet with forest fires and this is the first one that I ever helped to extinguish.

I was about as sleepy as I ever want to be when I got to bed that night. I had just been out on our fishing trip for three nights and did not have a chance to get much sleep. I got up at four o'clock that morning and walked up here before breakfast. About eleven o'clock the night watchman rattled on our door and told us that there was a fire up on the hill.

It was like pulling teeth to get up, but I finally succeeded and climbed about a mile and a half up the hill where the fire was burning. It had not started very badly and with a force of about fifteen men we soon had a fire line around and the fire under control by two o'clock. The most of the crowd went back to camp and went to bed, but two other men and myself stayed up to guard it. It broke out on us once but we had it out before it got very much of a start.

At six thirty another guard came to relieve us and we reached the cook house in time for breakfast at seven. I was so tired and sleepy that I could hardly find the way home. I scaled up the landing in half an hour and went home and went to bed. I slept until noon, got up for lunch, scaled logs for an hour and went to bed again. I expected to have to watch the fire again last night, but it was so nearly out that one company man was enough for guard. I caught up on sleep last night and am taking it easy today.

Miller's next letter tells of a health problem miles from medical help. It may have only been a toothache, but the early rangers did not have a medical safety net like today.

July 27, 1908

My Dearest Bess:

I hope that you will excuse the official looking heading on this paper but it is all I have in camp and I am sure you don't want me to wait until I can get some more before I write.

It may seem rather selfish to begin this letter by relating my own troubles, but I know that you must have expected a letter before this and I will have to let you know that my excuse for not writing was a good one. Your own good letter (which I have reread four or five times already) came Friday and it still further helped to remind me of the fact that my letter writing duties have been sadly neglected this week.

The trouble is that I have been trying a little experiment with that peculiar affliction known as the toothache. The results were that I did not get any sleep for three nights and had a case of that "don't care whether school keeps" feeling. Thursday night my pardner had the toothache so bad that I stayed up until twelve o'clock trying to relieve his suffering with hot applications. The next day I did not feel very well and by night, I did not know that I had so many teeth in my head. They were all insistently making their presence known and I had to stay awake all night just thinking it over. The pain did not let up until last night and then one side of my face began to swell. Last night I slept some better and aside from a certain lack of balance about my physiognomy felt fairly well.

I started once to write to you yesterday but I felt so bad I had to give it up. The weather for the past week has been decidedly hot for the mountains. Last night about 12 o'clock one of the worst thunder storms came up that I have ever seen. We had several bad peals of thunder that were enough to make you think the world was coming to an end, and then for a little while the rain poured down. It must have rained nearly half an inch, for this morning the dust is nicely settled and everything seems fresh and clean. The air feels fresh, like it did two weeks ago today when we started for the Big Trees that morning. I wish that we could have a shower like that every night. I believe that one would feel far better than in a dry climate.

We have been considering the question of building a kitchen on our cabin and doing our own cooking. The board at the cook house keeps getting worse and the four of us are convinced that we can board much better if we "batch." And then besides we won't have to get up at such an unearthly hour in the morning. We have breakfast at a quarter past five and as a rule we don't have to go to work until nine o'clock. Besides, as we only have to work two hours per day we will have, more or less, time to do our cooking.

I was planning a deer hunt back in the mountains for yesterday and today, but my pardner and I had to give it up owing to certain dental complications. If we had gone, I am sure that we would have had good luck, for a rain such as we have had always makes fairly good hunting. I want to go back to Dinkey and Coyote Lakes again before I leave here and get some pictures of the high mountain scenery. I failed to have a camera when I was there before.

Miller's interest in photography started at an early age and continued throughout his life. The official photography files of the Bureau of Entomology contain hundreds of his photographs. Many of the pictures are used for illustrating this book.

August 18, 1908

My Dearest:

Here it is Tuesday morning and I have not written yet. I would have written Sunday but I went down to Shaver and from there to Ockenden. Then I stayed to hear the meeting at Shaver in the evening and did not get home until nine o'clock. An outdoor meeting of the anti-saloon league was held at Shaver and they had a very good attendance. The speaker was Mr. Bristow, whom we heard down at Parlier last winter. He is an excellent speaker and I think made a good impression. It helps the League to have as good a man as that working for it.

I was getting ready to do some writing yesterday when the district ranger came around and I had to go back in the woods to mark some timber for cutting. Then I found that I had some back scale cards to correct which took me most of the afternoon. After that I got out with Parkinson for some rifle practice and then the day was gone. I have been planning to use this week to catch up with my correspondence and do some reading and I guess that I will succeed if nothing goes wrong.

I have been trying to get my plans settled for this fall but it seems like a pretty hard thing to do. I am more at sea than ever. Mr. Shinn was over here about two weeks ago and I had a talk with him. He seemed to be opposed to my leaving in September and wanted me to stay here this fall until this timber sale closes and then go back to North Fork and stay until Christmas.

I don't want to make any decisions yet until I can hear from the University and see if I can

arrange my plans there accordingly. I rather favor staying here this fall if I can do so without seriously interfering with my University courses; for nearly every move that I have taken in the Forest Service so far has been for the better and I feel disposed to give it a trial before I quit. "A bird in the hand is worth two in the bush," so I have heard and I don't like to give up this position until I am sure of another. Besides, there is the possibility that some opportunity may open up for a better position in the Forest Service and that will be this fall if it comes. I hate to think of waiting until November though to go down to the valley but then I will see you twice this fall anyhow, which is better than I have been able to do any year yet."

His spirits rising, Miller seems to feel more optimistic about his future with the Forest Service. Besides, he needs a steady job before he can marry Bessie. And deer hunting season was on. Decisions, decisions!

August 27, 1908

I don't suppose that you care to hear very much about the hunt. I always seem to have periodical spells of the hunting fever about this time of year and it takes two or three good trips to work it out of my system. This time Parkinson and myself took our horses and rode over to Tamarack creek which is about ten miles across the ridge from MacKenzie's Mill. It was after dark when we reached the creek so we had to camp without horse feed as best we could. It is quite a bit colder in the Tamarack basin than it is at Shaver and when we woke up in the morning there was four inches of ice on the water pail that we had left by the fire.

We started out at day break the next morning thinking that we would find some buck signs near the head of the creek. There is something exciting about buck hunting that does not depend on whether you find the deer or not. Getting out at daylight on a cold frosty morning may not seem particularly inviting but you feel fully repaid for it before you are out an hour. Climbing around over the high rocky ridges where the bucks range gives you chance to see some magnificent sights. And then, there is a certain excitement that belongs to the hunting, for you have to be on the alert, all the time.

About nine o'clock we struck a trail and had not followed it very far before we startled a big buck, but it was in the timber and we did not get sight of him. We followed his trail until three o'clock in the afternoon when we jumped him again out of a fir thicket where he had bedded, but he had been watching his back trail, so we missed another chance of seeing him. About four o'clock we started him again out of a little meadow but it was getting so late that we could not follow him any longer as we had to head for home. We had walked nearly twenty miles and had not seen a deer, but I think that we went home just about as well satisfied as if we had. We are pretty well acquainted with the country and the buck now, so we will go back in a week or two and get him.

I am still postponing the matter of my going back to Stanford until I can hear from some of my friends at the University. I don't think it pays to decide on anything like that too soon for sometimes if you let it go it will settle itself.

This is my week to watch the woods so I will have to ride out pretty soon but I am going to finish this letter before I go. I am glad that you have decided to finish school this year. It may seem like a waste of time in some ways, but I know that you will never regret it. I have often felt that I could have done better in some ways if I had not tried to finish school, but I am very glad now that I stayed with it.

I was intending to send the rest of the party a set of those pictures only I have not had a chance to print off any of them yet. My developing outfit is over at North Fork but I expect to make a trip over there in a few weeks and I will try to get some of them printed.

We are getting along very well now batching and hope to do better in a few days when we get another buck. We are going out hunting again tonight. A peddler comes up to the mill about once a week which gives us a chance to get fresh fruit and vegetables.

In his youth Miller enjoyed deer hunting, but later in life he did not hunt and did not seem to miss the autumn buck fever at all. One thing he did enjoy was watching sporting events. His later diaries are full of entries noting football games, especially between Stanford University and the University of California, track meets, and baseball games.

September 6, 1908

We are expecting Mr. Shinn over in a few days and I hope to get my plans straightened out after I have another talk with him. I hate to think of leaving this place in the fall for that is the time of year that I enjoy the most in the mountains. I don't think I ever felt better in my life than I feel now since the cool weather has set in. I have gained 7 pounds in the last two weeks.

The big traction engine, that has been causing so much excitement on the hill has just arrived in camp. It was brought in here to haul the lumber from MacKenzie's Mill down to the flume to Shaver. Everyone has been speculating on whether it will ever be a success or not.

2:00 P.M.: I failed to finish this letter before dinner as my pardner came in with a mess of mountain quail and I had to stop and clean them. The quail season is open now and the mountain quail are in fine condition and very easy to get. I think we will have plenty of them from now on.

Yours as ever,
John

This is the last letter known from Miller that fall; the next series starts in January at Stanford University. Evidently Professor Doane was pulling at him one way and Supervisor Shinn, the famous first and long-term supervisor of the Sierra National Forest, wanted him to return to his staff. It says a lot for Miller that both academia and a field agency wanted him as the year 1908 came to a close.

CHAPTER 6: The Early Forest Service Years, 1909-1910

Miller's letters indicate he did return to Stanford University to pursue an advanced degree. But in January his thoughts were with obtaining a permanent Civil Service appointment with the Forest Service.

January 27, 1909

Mr. Shinn was here Tuesday night and lectured the Forestry Club. It was a wild sort of a night, pouring rain and other conditions which kept a good many at home, but on the whole the meeting was very well attended and every one seemed to enjoy Mr. Shinn's talk, although he discussed everything from forestry to the Platonic theory of life.

If I can arrange it I expect to go back to North Fork March 1st. The Examination (Forestry Assistant) will be held next April 14th and 15th and I will have to come to San Francisco or San Jose to take it. If I go back to North Fork the last of March it will hardly pay me to come back here again. I have very little to gain by staying here much longer and besides I want to get back to work and earning something like a decent salary again. So if I can get my leave of absence revoked for a month sooner than I had it extended, I hope to leave here in about four or five weeks. So if everything goes well I will not have to wait so very long before seeing you again.

Once more; it is now twenty minutes after eleven but I am going to finish this letter before I go to bed. I went back to the quad after supper and ran a typewriter until eleven o'clock. I am copying off a set of notes that I got from one of the State Foresters last summer. There are about 15,000 words so I find that it is quite an undertaking.

For once I do not find myself wishing for a buggy ride, although I surely would if climatic conditions were only a little different. I don't believe that I ever saw quite such a spell of weather—the nearest to it that I have ever seen was down at Pacific Grove two years ago when it nearly washed the town down into the sea. We have had rain steady now for two weeks and no sign of any clearing up yet.

Did I tell you I had a rather startling experience last week. Took dinner with Dr. Jordon!! [Stanford University President] The invitation included four seniors and graduates from the Zoology Dept. But it was not a very distinguishing honor as the Doc. occasionally invites upperclassmen.

I will either have to build a fire or go to bed or freeze to death. Considering the hour of the night, I think I had better go to bed.

Forever yours, John

Was Shinn doing a little recruiting at Stanford, specifically for John Miller? If so it says a lot for how well thought of Miller had become. It appears Miller also had the outdoor forestry work in his blood and was loath to become a city dweller.

February 8, 1909

My dearest Bess:

It is such a cold disagreeable night that I am remaining peacefully at home instead of going to church. We are certainly having a most unheard of winter. It rains all the time. Today has been worse than usual. It hasn't rained steady, but there has been a cold wind all the time with occasional showers of rain and hail. Outside it is raining now.

I went out to the University Chapel this morning expecting to hear a good sermon, but was more or less disappointed. It was announced that Dr. Jordan would talk on Lincoln. We are to have a holiday next Friday, Lincoln's birthday so this was a very appropriate time for such an address. Dr. Jordan, however, was not there for a very unfortunate reason. His daughter, Miss Jordan, who is a teacher in Los Angeles High School, was engaged to be married in a few months and her fiancé died very suddenly yesterday. It was quite a blow, I think, to the entire family.

So, instead of hearing Dr. Jordan, I had to listen to . . . the regular Minister which to say the least is something of an ordeal.

I have only three weeks left in which to get to North Fork and I am sure I will have to keep moving between now and then as I have a good many things to do. I am not altogether certain what is going to happen to me when I get there. I had another letter from Mr. Shinn last week saying that he was expecting matters to turn so that he could put me in charge of a District, March 1st. In that case he said, that he would recommend me for $1200.00 July 1st. I certainly will not object to that; at least not to the raise in salary. In that case he wants me to agree to stay on for a year, but I am hardly ready to promise that yet. Something else may turn up that I want to go into. I will explain

things a little more fully when I see you. I wish that we could talk it over tonight, but then, what's the use of wishing. It don't do any good.

The intercollegiate Carnot debate was held here last Friday night. Of course Stanford won. The medal this year went to W.C. Shelton, a brother of the Shelton who won it last year. They are both old Fresno boys and both seem to have remarkable ability along the same lines. Berkeley was completely outclassed by all three of our men! This makes the fourth consecutive year that Stanford has won this debate.

The Forestry School at Stanford seems to be on the point of going through. The Trustees have the matter under consideration now, but they won't make any decision for a month yet. It will take some time to get the school established, even if they decide in favor of it.

It is getting too cold to sit up much longer. I think I will have to call this a letter and go to bed."

As ever yours, John

Miller was an avid supporter of Stanford University, especially in any and all events competing with the University of California, Berkeley. As his career progresses it is interesting to see where he ends up.

February 15, 1909

My Dearest Bess:

I am sitting here listening to the gentle patter of the rain drops outside, and although it is not calculated to give one a very cheerful inspiration, I will do the best I can to write this letter. For a wonder it did not rain today, although it has been promising to all afternoon; but of course it is out of the question to let 24 hours go by without rain so it is setting in again tonight.

We had a holiday last week owing to the fact that Friday was Lincoln's birthday. The University had an assembly in the morning which was very good. Rev. Bert Estes Howard gave the best talk of the morning on "Lincoln, the Man." Dr. Jordan also spoke at some length.

At the close of the meeting, Mrs. Maud Wood Park of Boston spoke on Women's Suffrage. What do you think of Women's Suffrage anyway? I rather think that I liked the way this woman spoke better than I like her cause, although that is alright. She was certainly a very entertaining speaker. In the evening the Y.M.C.A. gave a smoker, which consisted of a number of athletic events, some music by the orchestra and a talk by Dr. Jordan. The affair ended up with a feed of peanuts. The Y.M.C.A. has a much larger membership this year than ever before, and they are working to get a new building. The Stanford Memorial Church is at last reduced to a huge rock pile about the foundations and is about in the same stage as when they began its construction ten years ago. It seems like a shame that a building so beautiful and which cost so much money should have to go that way. It is all clear loss to the University—the money would certainly have done far more good if it could have been spent in some other way.[1]

I wish that I could have been down home and gone to the league social with you. I don't believe that we ever did go to a social together. Still, I hardly have time to think about socials or anything else just now. It keeps me going until eleven o'clock every night to keep my work in shape. I am trying to get the dope on my examination worked up before I leave here so that I won't have to study so much when I get to North Fork. I am wondering where I am going to be and what I am going to do when I get there, but I suppose I will have to wait patiently to find out.

Lovingly yours, John

February 21, 1909

My Dearest:

I am about a day ahead of my schedule this time, but as I am writing letters tonight, I will try and finish this one before I go to bed. This is probably the last letter I will write to you from Stanford for some time to come; perhaps the "very last" one and I certainly hope that it will be the last one I write you from here.

I was in hopes that I would have a chance to see you before I have to write another letter, but I am not so sure about that. I will have to go to North Fork before I can come down home. I have to report there the 1st of March and I can't get away from here before Friday, so it just leaves me Saturday to get into North Fork on the stage. However, I expect to come down the following week as I have to come down to Reedley to get a horse and outfit.

I will have to put in the most of tomorrow I think getting packed up and ready to leave. It seems to me that I never have a chance to do

[1] This was a result of the 1906 earthquake.

anything but pack up and go. About as soon as I get settled in one place, something always happens that I have to get up and go again. I am afraid that it will always be that way for some time to come according to the way that I am planning things at present. (I know I ought to say "We" are planning, for your approval will have to rest pretty much on my plans from now on).

I somehow feel that I am leaving Stanford for good this time. Of course, I may come back some time for another semester's work but I think that I ought to give the Forest Service at least two years trial before I leave it again. There is the possibility that I may make good there and work into something worth while and besides I have made up my mind to pass the Philippine Service examinations in two years. I know that it is a pretty hard thing to look ahead and tell just what is going to happen, but at present I intend to go into the Forestry work and see what I can do at it. All my opportunities seem to be along that line and everything present seems to oppose my ambitions to become "an old maid school teacher."

We had two fine days this week that gave me the "mountain fever" and made me wish that I were back in the hills again. Yesterday and today however there was quite a decided change and we are having the usual storm and cold rain. I will probably run into some snow before I get to North Fork.

Thursday I went through the arboretum with Professor Dudley to look over the conifers there. I think that I have enjoyed my work and association with Professor Dudley more than anything I have done this year. It has largely compensated for the six months that I have spent here. He is certainly one of the finest type of men that I have ever had the pleasure of knowing. I had expected to work with Professor Kellogg, but he did not return last semester as expected and is still on his honeymoon.

Miller's ambitions were clearly toward the Forest Service appointment now that decision time was upon him. And, spring fever for the mountains was also tugging at him. One can sense that he had the intellect to become an academic, but his heart was in the Sierra Nevada. In undertaking this course of action, he needed equipment and transportation. Forest Service men had to provide their own riding and pack horses at that time, so Miller was casting about for some good horseflesh to get him over the rough Sierra trails.

February 8, 1909

Dear Friend John:

I believe that I have that location of a good (one of) horse flesh for you if you want to go as high as seventy five dollars. It is a five year old mare, raised in the mountains, rides, drives and sound as a bell so far as I can see, and has the size. Cannot say much about the color, but I imagine that after she is shed, it will be blue roan.

The fellow who has it bought it from an Indian up above Squaw Valley, and has had her about two months. He drives her and works her. I saw her Sunday and if you want her let me know what . . . [page missing].

I am very busy. There is another dentist in Reedley so chances are that I will have more time for myself in future. I bought a coming three year old colt the other day for $100. It can go about four gaits and I am riding at leisure times and will show you something nice in horseflesh some day if my expectations are not overdrawn.

I hope for an answer soon and trust you will believe me.

Very truly yours, A.V. Acker

February 12, 1909

Dear Friend John:

I received your letter this morning and immediately rang up Mr. Huey and explained to him the circumstances in regard to the option etc. and your coming down the first of next month. He will not consider the option at all as the only reason for him parting with the mare is that he is badly in need of the money. Now I am sure that you could not buy a horse that would suit you better, and if you can repay me when you come down I will pay him the $75.00 for you, and let him keep the mare until you come down, if you want her taken to your father's place, will do that.

If I can help you out in this matter let me know, and I will do what I can for you and trust that you will accept friendship and assistance as intended.

Very truly yours, A.V. Acker

P.S. Will you kindly let me hear from you immediately by return mail. Arthur

Seventy-five dollars was a lot of money in 1909, so a good horse was expensive then just as they are now. Many horsemen preferred a gelding over a mare because horses from several outfits had to be pastured together or used together on the trail. It is not known whether he bought this

horse, but some of his later diary entries mention his mare, so I suspect he eventually purchased the horse.

March 9, 1909

I don't feel very much like writing tonight. They are having some music at the South Fork Hotel where I am staying now and the music always makes one homesick when I hear it in the mountains. I am rooming with Mr. Howard who came out here from Harvard last year. He plays the violin and some one is playing the piano with him. I wanted to stay in the parlor and listen but I knew if I did that I would not get this letter written tonight. And then it is tonight or never for I have to leave on my trip to Mariposa tomorrow and I won't have much chance to write letters until I get back.

I suppose that you might like to know how I got here, so I will try and explain my presence here before going any further. I went up to Sanger the next morning after seeing you. Of course I left on the 7:40 A.M. train. Somehow I always seem to leave on that train. I took the stage from Sanger up to Trimmer. It was quite a thrilling trip. We peddled hay and vegetables along the road and stopped once or twice to fish in the river. It is 28 miles from Sanger to Trimmer and it took us from 9 o'clock in the morning until 5 o'clock in the afternoon. I spent the night at the ranger's headquarters at Trimmer with my pardner of last summer, Bill Parkinson. There are three rangers staying at Trimmer this year. They have built a new house and are fixed up quite comfortable.

My principle [sic] object in going in there was to get the horse I had last year and this I succeeded in doing. The next morning I started out to ride up to North Fork. It was raining a little but I had a good slicker and it quit raining about noon. I stopped in the Auberry valley Thursday night and got into North Fork Friday noon.

Yesterday I was treated to my first experience in a snow storm. When I woke up in the morning it was raining but this soon turned off into a fine snow. In a little while we had the ground covered with several inches and in the afternoon, it came down harder. This morning when I got up (about 8 a.m.) it was one grand sight. The ground was white, the morning was clear and the pine trees were bending under their weight of snow. The day was so warm though that the snow all disappeared this afternoon. I took a two mile run with Howard this morning and a cold bath and have been feeling fine all day.

J.M. Miller family

Figure 17—Miller on horseback, Sierra National Forest 1909.

I don't much like to leave South Fork as it is a very nice place to stay. However I will have to start out early in the morning and spend the most of next week up in Mariposa County. When I get back I hope to stay here and work in the office until I go down below and take the examination. Then in all probability I will take the district up there.

Miller was a tall, long-legged ranger and the several pictures of him horseback showed his preference for long-legged, 15-plus-hands horses. From his outfit, as the old song goes, "I see you are a cowboy." That he also took a run with Mr. Howard indicates his fondness for athletic outlets (fig. 17).

March 16, 1909

I got back day before yesterday from the trip up north where I went to take a look over the proposed "District." Mr. and Mrs. Shinn drove over to Jerseydale in a buggy and the head cattle ranger and myself rode over. The trip was a little hard on man and horse, but on the whole it was exceedingly interesting and well worth while even if I did not intend to go back there soon.

The first day we rode through to Grub Gulch and stayed at the old hotel overnight. Grub Gulch is not a very classical sounding name and the town

does not disappoint your expectations after hearing the name. It is a relic of the old mining days. Several thousand people once lived there and worked in the old "Death Trap" mine and several other prospects near there. Since the mine closed down the town has naturally faded, and one by one its numerous buildings have been torn down and moved away.

There are still left several hotels and a store or two. One of the hotels is still kept up by one of the old miners who has not yet acquired the ambition to move away. Mr. Tully and myself ate our supper and breakfast in a dining room that had once seated over two hundred people.

Tuesday morning we rode over to Ben Hur, another town with a classical name but little else to speak of. We stopped at another ranger's camp for lunch and rode into the old town of Mariposa about seven o'clock that evening.

I think that Mariposa is one of the oldest towns in the state. It is almost as old I think as Monterey and has some of those old Spanish buildings that were put up by the Spaniards who first visited and settled in California. It is now the county seat of a county that lies entirely within the hills and is situated forty miles from a railroad. During the mining days it had a thriving population of five or ten thousand inhabitants. Now there are scarcely fifteen hundred inhabitants who are left to tell the tale of the golden days that once were.

Wednesday morning we went out to Rangers Camp and talked to a number of the dissatisfied residents of our National Forests. On the whole I found the people very nice and was never treated any better any place. I am not anticipating very much trouble in handling the situation there for most of the disputes that were causing so much trouble last fall are practically settled now.

I left there Thursday morning and stayed overnight at Fresno Flats and came on to North Fork Friday. Yesterday was a beautiful spring day and I worked all the time in the office when I wanted to be outside.

Just before I left on the mountain trip, I had a letter from the University saying that I had been recommended for a position as assistant entomologist in Hawaii!! I have had so many of these things turn up though, that I have little confidence in them and will believe that I have the job when I hear about it. On one hand, I told Mr. Shinn that I would take the mountain district if nothing else turned up. I am very well satisfied with his plans for me up there. He only intends to have me stay there a year, and will then transfer me to some other line of work. The principal advantage that I see of the place is that it will bring my rating up to $1200, and perhaps give me a good standing with the Service. On the other hand I have decided that as soon as an opportunity comes to go to the Orient, I am going to take it although whether I actually go or not depends pretty much on what you say.

Now Mr. Howard, who I'm rooming with at the South Fork Hotel insists that it is bed time. I guess that he is right, so gutter Nacht.

Yours as ever, John

Miller was witness to the tail end of the gold mining era. Most of the mines had long since ceased operation, but there were remnants of towns and buildings that are now lost to history.

March 23, 1909

I stayed up at the office last night and studied until about twelve o'clock and then started down to South Fork. It is about a mile from headquarters to the hotel where I am staying and down hill all the way. It was just beginning to snow when I left the office and the sleet blew in my face so that I could hardly find my way home. This morning it was still snowing some, and about four inches covered the ground, but it disappeared rather fast and was gone by noon.

I went up to the old Mission pasture to try to catch my horse, as I turned it out there some time ago. It started in to storm again so I had to give up and come home. I really enjoy the snow as it is quite a new experience to me. I don't suppose that it would be so nice if I were up further where the snow is deep, but it certainly is a wonderful sight to see the pines bending down with the weight of it and the bushes and ground cover white. It reminds me of Whittier's "Snowbound."

My plans for the work there are coming through nicely just now. Mr. Shinn has promised to let Howard go up and help me for a month with the surveying, and also to let the head cattle ranger stay for a while until I get the grazing matters started.

Even though he was probably better prepared than most, his letters often mentioned his studying for the civil service examination for forest assistant. He also refers to classic literature in this letter and others, indicating he read

things other than forestry and entomology literature. John Miller was an erudite man with broad interests and curiosity.

Sunday night, March 30, 1909

My Dearest:

I will do my level best to write a few lines tonight, although I just returned a few hours ago from a long hard trip up into the snow. As that is the subject on my mind most just now, I might as well tell you about it as it was the most interesting trip I have ever taken in my life.

Mr. Howard and myself have been watching for a chance for the last month to go up on the hill and if possible climb up on Mt. Shuteye. There is about twenty feet of snow up there now but of course that made the trip all the more attractive. So when the Supervisor remarked that he wanted someone to go up and look at the buildings at his upper camp we promptly volunteered. We left here Saturday morning carrying a light pack and snow shoes.[2] When we had tramped for about three hours we reached the top of the ridge above North Fork where we found the snow too deep to wade anymore so we took to the skis, and after breaking my neck a few times and doing considerable damage to the picturesque mountain scenery in numerous places where I fell down, I finally got so I could travel. We stopped at the upper camp for our noon lunch and had a very nice little lunch and a rest before we started back to the shake camps at the foot of Shuteye.

The weather did not behave very nicely and about two o'clock it began to snow. The snow here was about ten feet deep and as the loose snow accumulated on top it soon became very heavy snow shoeing. We were pretty familiar with the country or we would not have been able to find our way. As it was, it took us about four hours to go four miles and we reached the camp about six that evening. I was never so tired in all my life. The old bachelor who kept the camp cooked us a good hot supper and I went to bed about an hour afterward and slept like a log.

This morning we went up to Mr. Stout's camp about a mile from where we stopped for the night. The snow here was 10 feet deep. The cabin was so completely buried that only the gable end of the roof stuck up above the snow.

We took breakfast here and then went on up nearly to the foot of the mountain. Here I broke one of my skis which rather disarranged our plans about going up on the summit. We worked our way back to Stout's where I fixed my ski and then we started for home. I was very glad to get in here about five o'clock this evening and get a hot bath and some supper.

I think that we have some very nice pictures to show for our trip. I would be quite willing to start back again tomorrow for I certainly saw more beautiful and interesting sights than I have ever seen in two days before.

Well, I see that I will bore you to death if I keep on with this "thrilling" narrative. I have a good many other things that I ought to think about just now, for I have several weeks of hard studying to do before my examination comes off. You were quite right about the time of the examination. It occurs just two weeks from next Wednesday & Thursday, April 14 and 15.

Sunday afternoon, April 5, 1909

I finally escaped from the office last week and had a chance to spend three days in the field. We were running a survey up near the Cascadel Ranch. It is one of the prettiest places that I have ever seen in the mountains—located in a cozy little valley which opens out to the plains on the lower side. It has a most delightful climate the year round—warm in winter and cool in summer. We have certainly had some perfect days for the last week. It was almost too warm. If I had not been able to get outdoors for the time I think that I would be sick. As it is, I have been feeling fine. This morning I took a 2 mile run with Howard which helps very much to "straighten" out the spring inertia of one's system.

There is going to be a convention tomorrow of the five District rangers and assistants. It will last for two days. I don't know just what the program will be yet. I suppose though that I will be down for something of course.

He ended up establishing some long-term study plots at Cascadel later in his career. These plots were used to study bark beetles in ponderosa pine, a study that continued into the 1930s. His time in the Forest Service proved valuable when he started doing research on bark beetles for the Bureau of Entomology. His knowledge of the timber types and lay of the land enabled him to choose some important long-term study sites in the Sierra Nevada.

[2] Skis were also called snowshoes at that time.

Continued

April 20, 1909

I am a little bit tired tonight as the trip today was rather long and hard. On the whole thought I had rather good luck as I came through without any serious mishaps. I left Fresno at 7 o'clock this morning and got off at a switch about eight miles from Polaski. I found three horses waiting for me there so I climbed on and started out. I reached Polaski at ten and Bellview at 1:30 where I added another horse to my trail. I had no bad luck on the road so I made the entire trip today—about 60 miles—and arrived at South Fork at 6:30 in the evening.

As ever, John

P.S. Address me at Bootjack, Mariposa County, c/o Forest Service

Bootjack? What a name. It is east of Mariposa on state highway 49. It probably was one of the old collapsing mining towns that often became temporary Forest Service work centers in the early days.

April 27, 1909, Sunday night

I was also both surprised and pleased to know that you would be willing to address a letter to such a place as Bootjack. It is certainly a very formidable looking sort of name and one quite unsuited to civilization. The place is no better than the name. It is a little one horse post office about six miles from our camp along the mail road out from Mariposa. You don't see much there except three houses, and one of them is a barn.

I intended to write sometime again last week but I had so much traveling to do that I did not have the chance. We did not get away from North Fork until last Wednesday morning. We made the ride through in one day although it is quite a trip. The next day I had to go to Mariposa to look up some land records in the County Court House. Mariposa is twelve miles from here and is the nearest town of any size. I did not get back until late in the evening and had to go up near Signal Peak to look over a claim the next day with the same result—I got home late.

So far as my work is concerned at present I think that I shall like it fairly well, although I have considerable to do between now and the opening of the summer season. We certainly have a camp full of rangers here now. Altogether there were nine men there yesterday and there will be about seven

J.M. Miller family

Figure 18—Bootjack Rangers, Sierra National Forest, May 1909. John Miller is second from right.

tomorrow. I think that we will camp at our present quarters for a month or six weeks yet before we establish a permanent camp. We are all living together and batching—I sometimes think that I have had enough of batching, but we have a very jolly time of it here.

May 1, 1909, "Bootjack"

This will be another short letter as I will have to write it before breakfast. It is now 5:20 a.m. so you see that I am getting up pretty early. I have a chance to mail this letter in a little while so I will try to do the best I can.

I have been very busy this week; in fact I have been very busy ever since I came up here. I have a crew of eight men and it takes some rustling and planning to keep them all going [fig. 18]. We are working now on a pasture fence where we will probably have our permanent camp for this summer. It is a very pretty location although I am hardly in favor of establishing the District headquarters here on any place in this neighborhood for that matter. I think that next fall we will try and get a station over near Fresno Flats. That is on the regular Yosemite stage road and we get a daily mail there. At "Bootjack" the mail only comes three times per week which is not very satisfactory, all things considered.

I am of the opinion that you are having some warm weather down in the valley now. It has been fairly warm here, although we are over 3000 feet up in the mountains. It gets warmer here I believe than it does at the same altitude other places in the

mountains. The feed and wild flowers are growing nicely every place in the hills here.

Yesterday I rode out to Jerseydale where one can look across the Merced Canyon and see the Yosemite peaks. It is a very pretty strip of country up that way-much prettier in fact than I expected to find in this District.

May 6, 1909

To begin with, I spent the best part of yesterday by taking a ride with Mr. Tully and Howard out to the Outlook point above the Merced river where we could look out over the old Hite mine and Devil's gulch. This is the first time that I have had a chance to see the northern boundary of this District although I have been here now considerably over a week. I must say that I saw some pretty wild and rugged looking country. I could see the Merced river and down to the old Hite mine.

This morning when I first got up and went out to look for my horse, I made the discovery that she had disappeared in the night and it took me several hours to find her. Then by the time I had saddled up and was ready to go, it was almost ten o'clock. We went up past Jerseydale, a very picturesque little valley set in the pines and on down the old Hite mill road. This is one of the historic mines of California and once produced millions of dollars for its owner. A well built road once ran from Mariposa to the mine on the South Fork of the Merced River. It is down in a very deep gorge and it hardly seems possible that anyone would live in such a hole, even for gold, but never the less a busy settlement once thrived there.

The mine was abandoned some years ago and the road is rapidly going out of repair. TheYosemite railroad comes up the Merced River several miles from the mine. Another railroad has been surveyed up the South Fork of the Merced River to Wawona and I suppose that if we wait long enough we may sometime hear the train whistle up in this country. It will give us a much easier method of getting here when it comes.

I have been very busy ever since I first came up here and I find that I have a bigger contract on hand than I expected, although everything is going along as well as can be expected. It will take some time to get the District into shape but I have agreed to stay for a year and I intend to see it through unless something happens to change my present plans. I have had very pleasant dealings with the people here so far, but it will take some time to establish ranger stations and administrative sites.

I saw in the paper last night that Mr. Shinn might possibly be promoted, which means that we will have a new supervisor here. I don't know yet how that will affect me, although I am quite sure that it will not affect my present position for some time. Mr. Shinn was exonerated from the charges made against him by the people of this District and the chances are that he will be transferred to some other line of work.

It was not uncommon during the early days of the Forest Service to have local citizens file legal charges against the Rangers or Supervisors for thwarting their God-given and historical rights to cut timber, mine, graze stock, and hunt wherever and whenever they so desired. Sometimes to save the officer so charged, the Forest Service "promoted" them out of the area to save them from bodily harm or ostracism of their family. The early years were not always fun years, but apparently Miller got along with the local pioneers quite well.

May 13, 1909, Tuesday night

I have not entirely recovered from the effects of going to school yet, and even after I have gone to work out in the cold world where I have plenty of other things to keep me busy and all I need to keep me occupied, I still seem to be unable to avoid the impression that I will have to quit pretty soon and get ready to begin school work again. I received a notice in the mail last night inviting me to the reception of Pres. and Mrs. Jordan to the Senior and Graduates at the Zoology building. I will have to hurry some, I am afraid, if I go.

The Wawona Big tree trip was quite a success. Mr. Howard and I worked all Saturday morning with the surveying crew and rode over to Wawona in the afternoon. Wawona is quite a picturesque place with one big hotel and a number of small summer cottage buildings. There were a few tourists there on their way to Yosemite Valley, but as yet the season in not underway. The biggest crowd comes in June.

We took the trail up to the Trees a distance of about 8 miles. The grove is much larger than any I ever saw before. In fact there are really two groves, and upper and lower and both contain hundreds of large and small redwoods. This is the grove which has the famous pictures which you have seen so often. The Wawona, which had a roadway running through it, and the Grizzly Giant, the largest and oldest tree in the world. The best part of the trip

though consisted in the view from Wawona point. This gives one an outlook over the South Fork of the Merced Canyon and it was well worth the trip. The Merced Canyon has some very pretty falls known as the Chilnualna. The falls are a long series of cascades which form almost a mile of spray. We came back over Signal Peak and so had another fine view of the mountains and plains before we arrived home.

The weather has changed from warm to cold again. My fingers are getting so cold that I can hardly write, so I will either have to build more fire or go to bed. From the way I feel, I think I will have to go to bed, so good night.

Forever your own, John

Miller had not fully recovered from the "Universities," a common syndrome in those who had just completed a satisfying college career. He kept close ties to Stanford University throughout his life.

Wawona is a beautiful area in Yosemite National Park. In 1909 there was a company of U.S. Cavalry from the Presidio, San Francisco stationed there in the summer months who acted as park managers. They evidently had not arrived yet or Miller probably would have mentioned them.

May 17, 1909, Sunday night

My Dear Bess:

I started a letter to you Friday night and intended to mail it at Fresno Flats today; but I failed to finish it so I guess that I had better begin all over again now.

I was too tired Friday night to write much of a letter as I had just returned from a trip to Mariposa where I spent a day in the County Recorder's Office looking up land cases. It was a pretty good long ride. I left at eight in the morning and returned at six o'clock at night and spent 4 hours at the court house.

It seems peculiar to speak of this as a "court house." It more nearly resembles a large size school house, but as it was built in 1854, it is not to be expected that it has a very prepossessing style of architecture. Besides, it is quite in keeping with the town.

Yesterday, Bill Howard and myself left here about three o'clock in the afternoon to go to Fresno Flats. Before we had been on the road for an hour we changed our minds and decided to go to Miami, where we could get telephone communication with North Fork. This is about twelve or fifteen miles from our camp and requires a climb of about 1,000 feet. We reached there about half past six and stayed over night at the rangers' camp. There was one ranger and his wife there.

We telephoned to North Fork, Fresno Flats and around over the Reserve generally. The telephone is certainly a great institution up here in the mountains. It saves all sorts of hard work and inconvenience. This morning we left the Miami camp about eight o'clock and rode down to Fresno flats in about two hours and a half. Our principal reason for going down there was to get a horse which I bought. I now have a "real" horse. I wish you could see him. He is a big bay, five years old and as pretty as a picture. I don't know what to call him. I will have to try and get a good name for he is gentle and sensible and has a good disposition. I still have little Chiquita but she looks so small beside him that I guess she will have to do for a pack horse now. We left the Flats about one o'clock and arrived here at seven, just about two hours ago.

I will have to go over to North Fork again about the first of June to meet our new Supervisor. Mr. Shinn is going to leave about the first of July, having been promoted in the Service. I don't know yet how this is going to affect my plans, but I suppose that I will have a chance to stay here just the same as I intended. It may relieve me of my agreement to stay here for a year, but I won't know until after the first of July whether I will want to stick to that or not. We will certainly miss Mr. Shinn as a supervisor for he has done a great deal for the forest and for the men who are working under him. I expect that we will have a sort of farewell "hurrah" at North Fork before he leaves.

I will have to let this do for this time as it is time to go to bed. I will have to get up early in the morning.

Forever yours, John

Supervisor Shinn was the first and only Supervisor the Sierra National Forest had ever had to that point in time. He was a legendary pioneer Forest Service Officer. His wife, Julia, also worked for the Forest Service as the telephone operator (called a dispatcher nowadays) in the Supervisor's office. It was said she did this as a volunteer. The Shinns retired in North Fork.

June 6, 1909, Friday night

My Dearest Bess:

I shall probably not have a chance to write tomorrow night or Sunday as I expect to leave for Yosemite then, so I shall probably have to mail this letter in the Valley or some place along the road. Besides, I certainly owe a letter by this time so I will do my best although it is nine o'clock.

I would like to come down to the plains about June 4th [July?] but I don't see how I can as I have to be in North Fork on that date to meet the new Supervisor. There will be a general meeting of the District men of the Sierra Forest then to meet the new "boss" and say goodbye to the old one. We will all be sorry to see Mr. Shinn leave. He has always been a good man in the place and he always seems to have the interests of his men at heart. I have been wondering whether or not I will have as good an opportunity under the new Supervisor but I presume that if I do not, I will soon find it out.

Monday morning:

This letter was unfinished Friday night so I will proceed to add something to it while I am writing in camp. Howard and I rode through to the valley yesterday and we are now camped on the Merced River with the grandeur of the Yosemite all about us. I don't know whether I am sufficiently impressed with it all or not, as it looks so much just like the pictures I have seen and read so much about that I can hardly believe that I am seeing anything new.

The trip in here was almost as interesting as the valley itself. We left our camp about six yesterday morning and came down the old road to Hites Cove on the South Fork of the Merced River. This is a pretty big canyon and very rough and wild. We had a steep, hot trail to climb in getting up the north side of the canyon. We crossed the main Merced on an old cable bridge which threatened to give way at any minute and let our horses drop down into the cascade below. Still it held us up long enough to get our horses and pack over. Then we followed up the railroad track to El Portal.

It seemed rather queer to be riding along a railroad track in the middle of the mountains, but it came in very conveniently too. The track follows right up the main river to the boundary of the National Park and from there a wagon road leads on to the valley. We reached El Portal about four in the afternoon and rode on to the valley in the evening.

We stopped at a little camp above the Sentinel Hotel and were mighty glad to get there as we had been traveling all day and it was then about 9 p.m. I don't think that Yosemite is a nice place at all to camp. The place is all tied up with rules and regulations and the Valley usually is full of people. Still, there are not many campers in here yet and this morning we found a beautiful little camp right along the river.

Mr. Howard has been expecting his folks out from the East for a long time and they arrived in the valley by stage this morning. He expects to go back with them to Wawona and then take them on to North Fork. I will have to go back alone I suppose about day after tomorrow.

It is quite warm in here today and I am loafing around camp here as I write. It seems quite natural to hear the murmur of the Merced River and look up to Glacier Point on one side of the valley and see Half Dome on the other. You can hear a gradual roar from the waterfalls. They are the most interesting and picturesque feature of the valley. I think that I have seen some canyons in the higher mountains that are almost as good, but we do not have them all in one place and we do not have in any place such magnificent waterfalls.

It is almost time to start dinner, so I think you have tried to read this writing long enough. I have a stub pen and I can't write much with them. Someday I will have to write to you on my new typewriter so that you can read it.

I will write you again when I reach North Fork.

Forever yours, John M. Miller

Yosemite Valley obviously captured Miller, for he returned there at least once a year for either business or pleasure for the next three decades.

It is interesting to note Miller's dislike for all of the rules and regulations and hordes of tourists in 1909. He should see it now.

June 8, 1909

I have been pounding on the typewriter all day today and worked off two long reports that I have been dreading for some time. I have had four and occasionally five men at work all this week. We are building a "place to live" up at the Cummings Station. We have about completed now a good sized barn, and will probably begin on a five room house after the first of July. I have been wondering

if I will have someone to share it with me next fall! I almost hope not for I hope to be some place else next fall, although we have a pretty location at the Cummings Station I hope to hear from my examination pretty soon now. It may not change my present plans very much, but I am in hopes that it will.

Rangers not only had to be horsemen and packers, but they also built most of the original ranger stations, cabins, and barns. Many national forests still have an original building or two standing from these early efforts maintained as historic sites (Joslin 1995).

June 21, 1909, Sunday night

My Dearest Bess:

It is after ten o'clock but I am going to do my best to write before I get too sleepy and have to go to bed. I have procrastinated most shamefully today and did not get around to letter writing until the very last thing. I had two reports to get off in tomorrow's mail, but I put them off until after supper and then I found more work than I expected, so here I am, just getting through now.

The weather is behaving quite improperly this season. It treated us to a very heavy rain last Friday which was quite unheard of for the 29th of June. We had to lay off for a day, and the farmers about here are all discouraged over having most of their hay crop spoilt. It is almost as bad as a rain down on the plains during the raisin season. It has been dry for so long that this shower seems as though fall were upon us. And the fourth of July not gone yet! I am afraid that this will seem like a long summer although I think the time will go fast enough from now on.

I hope to hear from my examination in a few days or a week now. I may not hear until July 1st, but am beginning to wonder how I came out. My application papers came back to have several dates corrected, which had to be done by Mr. Shinn at North Fork. I carried these with me on the trip through Yosemite to North Fork, and as luck would have it, lost them there. They were returned to the Yosemite P.O. and mailed to me at North Fork after I had left that place and returned to Mariposa. However, Howard happened to get them and as he understood the situation, had them corrected and returned to the Civil Service, so that I think they arrived in time for me to get my rating.

I have had to put my bay horse out in pasture again as the Yosemite trip used him up pretty bad. Yesterday I packed some shakes for our barn down the mountain on Chiquita. Packing shakes however seemed to be an occupation quite unsuited to her tastes and sensibilities and she proceeded to make her objections known by bucking about 300 shakes off and scattering them at various intervals over the mountain. Some of them are there yet, but we gathered up most of them. This was not quite so dangerous though as your episode in Parlier.

It is getting late. I must "zu Bett gehen." Mr. Egan, one of our men, is still writing here too. Says he's writing a girl in Missouri!

As ever your own, John

So maybe the mare, Chiquita, didn't like being a pack horse. She may have been too small for Miller's lanky frame, but she wasn't stupid.

July 12, 1909, Tuesday night

You may find it hot in Missouri but I think you can thank your stars that you are not down in the valley at present. We seem to be having another one of those hot weather celebrations and we are getting our share of it up here in the hills. I went down to Mariposa yesterday and almost melted down on the way back. I put in a good share of my time at the ice cream soda fountain while there, making up for all that I lost while up here in the hills.

Today I went to a cooler climate by going up on the hill above us to examine a homestead claim. It seemed good to be up in the Sugar Pines and the tall firs again. As I was coming home I passed through a little canyon where I saw some of the most beautiful rhododendrons that I have ever seen. They bloom early here. The sight of them took me back about a year to the time when a party of us were on our way back to Dinkey. I wish that I could have seen and experienced all of that trip again. It was not so much the Big Trees that interested me as some other associations.

Mr. Shinn left this morning on his way back to North Fork and I was not altogether sorry to see him go as I have been working early and late since he has been here. As usual, my plans have been more or less disarranged upon seeing him. He wants me to stay at North Fork this winter instead of Mariposa. Also he wants me to start out on a sort of entomological tour of the forest about this fall and work up a report on it this fall and winter. I hardly know yet whether it will be possible for me to get done all that he has planned, but I think I can't afford to miss the trip.

As ever yours, John

Supervisor Shinn was proposing a new project that would change Miller's life forever after. He had of course taken some entomology courses from Professor Doane at Stanford, and Supervisor Shinn was aware of this because he had visited Miller at Stanford the year before. To Shinn's great credit he discerned that his subordinate's education and interests could be used in a most useful way. And, obviously, Shinn had not transferred from the Sierra National Forest.

July 14, 1909, Sunday night

> Mr. Shinn has been here since Wednesday and has had me going some ever since. We have been working on the forest boundary, looking it over to see if any more land can be added to the forest, or if any should be withdrawn. Incidentally we have been visiting the settlers to see how they feel about it. The attitude of most of those we met seemed to be very friendly towards the Service. There are some very nice people up here in spite of the fact that many unpleasant things have been said about them and there has been almost two years war between them and the Government.
>
> Last night I went to a party up at Boothe's place. They are the largest and most influential family here—two of the boys are appointed rangers. We had a very nice time and did not get home until morning.
>
> This afternoon we went up to Ferguson's place. They are very peculiar old people who came here in 1885 and have a peculiar history connected with their ranch and early settlement. Miss Ferguson, their daughter, is the school mother here and a very nice girl. She was educated in Oakland.
>
> Well it is getting late and I have some rather bad news to relate so I had better get through with it as soon as possible. The Government seems to have gone bankrupt and has postponed all promotions in the Department of Agriculture until next January. This leaves me on my present salary until then, but Mr. Shinn has assured me that I am sure of getting a raise then, but it don't help me out very much in the meantime. Besides, I lost out on my examination in April so I will have to keep at my present work for a while. It does not affect my plans very materially as I expected to stay here anyway for a year. Mr. Shinn wants me to take up some work in entomology next fall which will take about a month of travel and also wants me to stay at North Fork for the winter. I hardly know yet whether I will agree to all of this as I want to have my sis Clara come up and stay with me this fall if possible.

Miller was just introduced to one of the vagaries of federal government service, annual appropriations may or may not be as much as expected and salary freezes are often the result. It is surprising though that he did not pass his Ranger's Examination. His education, experience, farm background, and intellect seemed to make him a natural for Ranger appointment.

July 19, 1909, Sunday night

> Everything is moving along at a rapid rate here, and my plans have been shifted about with considerable suddenness in last week. We will have our house done in another month but as I expected, I will probably not stay here this winter. I think I told in one of my recent letters that I came out about as I expected on my examination and that promotions have been delayed until next January. At present, my "boss" intends to put me on an altogether different type of work and turn the District over to someone else for this winter.
>
> He is willing to let me stay here if I want to, but he has also offered to let me take my scientific work, and spend my winter at North Fork. His intentions are that I shall work up a general report on the injurious insects of the forest from the Merced to King's River. This will require about six weeks work in the field collecting specimens, photographs and data, and take probably most of my time this winter working them into shape for a published report.
>
> I do not expect to get away from here before September 1st or possibly not until later. It is really up to me to stay here until I get the work in this District into some kind of shape. Everything has been going along fairly well, and I think that I will be free to leave in six weeks more. On the whole I think that I will like the work better than this District work and besides, North Fork is a much more desirable place to stay. Then, this other work will give me more of an opportunity, besides being interesting.
>
> Well, I don't suppose I ought to bother you with a discussion of all my troubles. I would rather talk these matters over with you if I could. You have not told me yet when you intend coming back to California. I hope to get down to Reedley soon after you return if you are there by October 1st. If

my present plans carry through I will travel down through the mountains with saddle and pack outfit, going through the back country and timber cuttings and finally work down home through the Kings River Canyon. It will be a most delightful trip, but I am not sure yet whether I will have anyone to go with me or not.

Yesterday I rode up to Signal Peak and from there over to Miami, where I stayed last night. This is a most delightful camp—it was so cold that we had to build a fire in the house to keep warm. There is quite a colony of rangers here too, counting in their families. The mountains are fine too as there are so many beautiful meadows which are just at their height now. The rhododendrons about them are a beautiful sight.

Miller was about to take up some "scientific" entomology work. This may have been an unusual assignment in those times because the national forests were usually short handed and underfunded and few Rangers could be spared from essential day-to-day work. Miller had obviously impressed Shinn with his knowledge of entomology and curiosity about the state of injurious forest insects in the Sierra National Forest.

July 28, 1909, Monday night

The management and responsibility of this work here takes a lot of time and is quite a strain on my small amount of gray matter. I have five men here now and several different lines of work going on. Sometimes I am too tired at night to write even when I have the time, so I go to bed without further ceremony.

You ought to be back in California to enjoy the cool summer we are having. It will soon be the last of July and we have not had any of the record breaking hot weather such as we had through July last summer. No fires yet as a result our work has been going along very well. The house is up and the roof will be on pretty soon. I sometimes wish I had more time to help work on it for I like to do some kinds of carpentry.

Miller's carpentry skills come in handy in a few years when he built screened cages to rear forest insects. He continued using these skills until the late 1940s at the Institute of Forest Genetics at Placerville, California.

August 23, 1909, Sunday night

Sunday night a ranger came in from District 2 and wanted two men to help on the telephone line. We were about ready to move up to our new camp so we made the move Monday and I sent two of the boys over to Miami Tuesday. That day Mr. Shinn came in and I had to take another trip with him the next day down into Hite's Cove. We left camp at 2 o'clock in the morning and got back at six in the evening. There was not much chance to catch up on sleep the next night for Mr. Shinn got me up at four o'clock again and we started out for Miami stopping at C.K. Westfall's and Mr. Boothe's on the way. We got to Miami that evening and I went out on the telephone line the next morning and worked until last night. There was shortage of men on the crew and we were trying to rush the line through so that we could get it over into our District. I was too tired to write last night and so went to bed. This morning I went down to camp meeting and did not get back until about an hour ago.

They are holding a camp meeting now about five miles from our camp. Today was the first chance I had to attend and they had a very good service this afternoon. I intended to stay to church tonight, but our grazing ranger, Tully, came over and besides, I wanted to write to you tonight.

As ever, John

In addition to other duties, forest rangers had to be telephone linemen. Two-way radio was still in the future, so the crank-operated battery-powered telephone, primitive as it was, connected the outlying guard stations, lookouts, and supervisor's office. The trouble was that the heavy galvanized line had to be packed and strung in some very rough country, over as straight a line as possible. Telephone poles were hard to come by and it took time to dig holes and set them, so white porcelain split-ring insulators on about a foot of wire were spiked 10 or 15 feet up the bole of large, live trees. These white insulators can still be found on large ponderosa pine, wherever old lines were established. The only problem was that during storms, trees might fall across the lines. The lines purposely had slack in them so the tree would ride the line to the ground and not break it. But the telephone would not work then, so someone would have to patrol the line, cut off fallen trees, and sometimes shorten

the line up a bit with a splice. The men doing this often worked alone and there are more than several cases of Forest Service men falling to serious injury when their climbing spurs tore loose.

September 3, 1909, Thursday night

I would give almost anything if I could only be down there for a few days when you arrive, but I know that my boss wouldn't think of letting me go at such a strenuous time as this. Fortunately, we have had no more fires since the big one down on the Merced River, but the season of bad fires will be on for a month yet.

There are five of us here tonight and we are very comfortably situated in our own new quarters. Somehow I like this camp better the more I see of it. I think that we will have a very pretty little house when it is completed. I don't much like the idea of going off and leaving it this winter. Mr. Mace, the man who is going to take my place for the winter, is here now and will probably stay for a few days. He will go back to North Fork and move up here with his family later. He has a wife and a little girl.

I wish that I could make some promises about when I am coming but I can't do that for a while yet. Still the season acts as though it were going to be an early fall. It is a great deal cooler than it has been for some time. The summer has gone so fast that I can hardly realize that it will soon be over. I am always glad to see the fall come. It is the pleasantest season of the year for me and I think the very best of all seasons in the mountains.

September 6, 1909, Sunday night

The Camp Meeting closed last Sunday and it seemed to be quite a success, both as regards to the amount of noise and the number of converts. I think that there were about 38 conversions altogether. Some of them were of the howling Methodist kind, but I presume that they were all sincere. They were going to start a movement today to build a church here. I hope that they succeed for I think that it would be a nice thing for them to have a church in this community. I would like to see them get a better minister, though . . .

Mr. Mace, the man who will probably take my place here this winter, came up here last Tuesday and left this morning. He will probably move up before long and bring his wife with him. He seems like a very pleasant sort of a man and I think will make friends among the people here.

It seems hard to realize that the summer is over. It has gone so much faster than I expected. The days are beginning to feel like fall though, and we had a little touch of rain today. We are not having the rain that we had last summer at Shaver. At camp 16, it rained almost an inch in August. I would like to see that much rain, now, to put an end to the fire season, but I am afraid that the farmers down in the valley would object. It seems strange yet not to be out picking grapes at this season of the year. I don't believe that I care much about working in a vineyard anymore. I think that I would rather fight fire.

September 11, 1909

I went down to the Boothes' last night. One of the boys here is going away and they were going to have a little evening's music for his benefit. However, he went down to Mariposa and did not get back last night. Two of us went down anyhow and we had quite a sing. The Boothes are certainly pleasant people and we always have a good time every time we go there.

I stayed at home yesterday and worked in the office all day—a new filing case came in the other day and I had to transfer all the correspondence. The day before, I went over to Miami and got my brown horse at the Grove pasture. He has been enjoying a protracted vacation for the last six weeks. He came here fat and looking fine and I hope to get some good use out of him from now on.

Miller's pretty bay horse was living a life of luxury in a Forest Service pasture. Most ranger station locations were chosen with the necessity of having pasture nearby for their horses and mules. These pastures were often very pretty natural meadows with a source of water. Consequently the old ranger station sites can be some of the most pleasant areas on the forest. Many such stations are still actively used as work centers or were converted to public campgrounds. All because the rangers needed fuel for their four-footed transport.

September 29, 1909, Saturday night

I returned last night from a trip to Fresno Flats where I rode to have my horse shod and also to have a talk on the telephone with Mr. Shinn. I also had a talk with him a little over a week ago before the fires broke out which rather unsettled my plans for this winter. I don't think that I have written to

you about this yet. I would much rather talk to you about it but that will be out of the question for several weeks yet so I will try and tell you something of it now.

My plans were to leave here sometime before this and work down through the mountains to North Fork and further south on a "bug hunting" expedition. When this was completed, the boss had planned to put me in one of the stations near North Fork and put in my time there through the winter, doing general office work and writing out my special report.

One thing and another has come up to delay my trip so that it is now pretty late in the season to start out. Although Mr. Shinn said a lot of nice things about my being too valuable a man to leave in a district, and that I could expect to be a deputy supervisor soon, etc., he did not offer me anything definite in the way of promotion. Besides his understanding that if I gave up this District now, I could expect to do so permanently, did not appeal to me very much. I prefer to stay with the district until something better turns up. Consequently, I got stubborn and refused to go in to North Fork this winter. I don't know whether or not the boss liked this very well, but he agreed to let me stay up here and do what I could with the special work in entomology using this as headquarters.

I don't hardly know whether I acted wisely or not, but I had several reasons for doing so. One was that if we carry out our plans I think that you will like it better here than at North Fork. Mr. Shinn still expects to move me out of here next May, but that is a good way ahead yet and a good many things may turn up between now and then. I don't suppose that I can make all of this clear to you until I have seen you and talked with you, but if everything goes alright, I think that we are safe in going ahead and making our plans.

I would say that if nothing interferes we ought to be able to set a date for that little affair on which my happiness depends, about next December. This will give us a chance to spend several weeks on the coast or some place so that I can come back and start to work again about January 1st when I hope to have that long postponed promotion.

I have been hoping all day that I would have a chance to get started out on my trip in a few days, but I had a letter tonight saying that an inspector was coming down here from San Francisco soon and for me to remain in the District until he arrived. This will delay my work quite a little. I may not be able to get down until about November 1st.

Miller's assignment to survey forest insect problems that fall apparently went awry. The "District" he is referring to is his Ranger District (Mariposa). In those days (before 1930) Regions also were called "District" e.g., District 5 for California. It seems that Supervisor Shinn may have been stringing Miller and his insect survey along for some unknown reason. Perhaps Shinn was simply too shorthanded to let Miller take off "hunting bugs" for 6 weeks.

October 5, 1909, Monday night

Now this sounds foolish does it not? To come down to practical affairs, I have every reason to feel like celebrating tonight. The fire season is over, the telephone line is completed, our house is comfortable and we will soon have it fixed for the winter. The telephone crew left here Friday and I now have one man left with me to run the District with this winter. We have just had a splendid rain, which lasted for almost 3 days and put a damper on the fires for the rest of this season. I suppose that a great many in the valley were rather sorry to see it on account of the raisins, but it is an ill wind that blows no good, and it certainly did sound good to hear that rain pouring down on our new roof.

An inspector was in here for two days and left apparently well satisfied with affairs at this end. He was from the San Francisco office and seemed to be an A-1 man in every respect. Before leaving, he asked me if I wanted to consider a position in the San Francisco District office—said that they had been looking for a man there with considerable field experience and he thought I could do the work. He did not know whether the place had been filled yet or not, but he would see about it when he returned. I told him that I would be ready to think it over when he had something definite to talk about but for the present would consider my plans here as permanent. I do not even know if it will be a desirable job, but on whole I will be rather surprised if I hear anything further from it.

October 11, 1909, Thursday night

I have been pounding the typewriter all afternoon and I almost feel tempted to use the machine instead of trying to write with pen and ink. I am becoming so accustomed to the machine that I can

scarcely write a letter anymore that anyone can read. In fact I am getting no better fast if such a thing is possible.

I wish that you were here now to enjoy some of this beautiful spring weather. I say "spring" weather for that is just the way it feels. The days are warm and the grass is coming out at a great rate. If this keeps up and we have plenty of rain later, we ought to have a good horse feed through the winter.

We returned from the Mt. Pinoche trip Friday night and I was certainly glad to get home. It was a hard trip over the most abominable trails and we hope to be able to keep out of that part of the District hereafter. I came very near losing my saddle horse in two or three places.

We reached the mining claims and stopped there the first night. Our second day of travel took us down to the railroad at El Portal and we came home Friday via Hites Cove.

Now his horse was earning his keep and then some. Horse accidents were common. Forest Assistant Pernot on the Ochoco Forest in Oregon died from a horse accident on duty in 1913 while surveying a bark beetle infestation. He was the first entomological worker to die in the line of duty (Burke and Wickman 1990). Many others have been injured including myself when I was bucked off a horse in the Eagle Cap Wilderness in 1992.

October 13, 1909, Tuesday night

I worked on our house yesterday morning and in the afternoon rode down to Chowchilla school house to send a message back to a man whom we are dealing with. I came home by Mr. Boothe's place and stopped there for supper. They are certainly nice people and have been extremely good to me this summer. Of course they are naturally friendly to the Forest Service as there are two of the sons in the work and they are stationed in two of the lower districts.

I went out hunting this morning but I didn't meet with much success. One of the Boothe boys came up here tonight and we will go out and try it again tomorrow morning. That means get up at four o'clock so I will hurry this letter along so that I can get to bed early.

I have been staying at camp as much as possible for the last few days trying to put it in some sort of shape. We want to build a fire-place for the winter and our house is not finished much on the inside. Other work keeps piling up though and it seems like I will have my hands full getting some of it completed. I have a homestead application to examine, several trespass cases to take up and a number of reports to complete. Consequently it keeps me planning to tell how my time is coming out. Sometime when I have a chance I am going to write you a decent letter.

Saturday night

My Dearest Bess:

I came down tonight from Signal Peak for which I departed about four o'clock this morning. It has been a very peculiar day. In fact, I don't believe that I have seen one just like it in the mountains. There has been a sort of blue haze over the hills that is so dense you can not see but a few miles. When I got up on the ridge this morning, I could look out towards the plains, and there seemed to be a heavy fog there. This afternoon has been quite cold, very much in contrast to the last few days which have been quite warm. We are all hoping for more rain which would be a great benefit to the country now and insure us a good feed for the rest of the winter.

We have been working on the water supply of the house and have it piped into the kitchen now with faucets, sink etc. That is, we will have it piped in here as soon as the water rises in the spring up on the hill. The hot weather of the last few days lowered it so that it scarcely runs now, but the cool weather will bring it up again, as soon as another rain comes. It will be convenient when we get it into working order.

Sunday night,

Today seems to have slipped by without my seeming to know where it went to. I have a lot of other letters to write tonight but I shall complete this first. It has been a lovely autumn afternoon and I have been wishing that we could stroll out on the hill or take a horseback ride or do something so that we could enjoy it together. Our neighbors, the Boothes, came calling on us this afternoon, and as we were just getting through lunch and did not have the house cleaned up yet, I guess that they formed a rather poor opinion of our housekeeping ability. Mrs. Boothe said, though, that we had a very cozy little house—that is, it would be such when we get it cleaned up.

I believe you asked something about the house and I will try and send you a picture of it before long. It has four rooms and two seven foot porches on the south and west. We are planning to build a fire place soon. In fact, we begin to feel the need of it these cold nights. However, the house is double walled on the outside, and covered with shingles, cottage fashion, so I guess that we ought to be able to stand the snow.

I have thought a great deal about our plans for this winter, and I am all the more anxious to see you soon and talk it all over. I have but one man left with me now and he goes over to North Fork the first of next week to take the examination, and I shall have to stay here until he gets back. You can depend on my coming down as soon after that as I can get away which shall probably be soon after Nov. 1st.

Of course you probably understand that if we are up here together this winter, that the arrangement will only be temporary and we will probably be at headquarters after May. Mr. Shinn tried hard to get me out of the District this fall, but I objected for various reasons. I had intended to put my time in this winter on special work in entomology, but did not have enough time for the field work this summer so I decided to try and have the work postponed for another year. It seems probable that I may spend next summer at this too.

In fact it is hard to depend upon a permanent home for anyone who stays in the Forest Service. In this respect, I guess it compares with the teaching profession or the ministry. While this mode of life has some advantages as well as disadvantages, I seriously question my right to ask you to share it with me, for I know your choice would be for something permanent. But on the other hand, I think that there are a great many things you would enjoy about a year or two up here. There are many pretty and interesting things to be seen, and there is a certain amount of freedom about the life that appeals to anyone who can appreciate beauty. Besides I don't regard the branch of the work I am in now as permanent unless advancement comes around my way. For the next year or two, it offers me a living and an opportunity to get into something better, so I don't intend to leave the Forest Service until I have given it a test.

November 1, 1909, Sunday night

My trip to Signal Peak was rather unproductive of any results except the evil kind. As I wrote you Friday, we had a good rain that did a world of good down here, and Friday morning broke clear looking as though it would be a beautiful trip on the mountain. I started out to make the climb on foot as I intended to stay overnight, but Mr. Davey laughed at me for going that way, as my horse, Mike, was kicking up his heels and working off surplus energy in various ways.

I saddled him up and rode up to the top of the ridge just back of camp. The peak did not look so inviting then as I could see snow over most of it. When I reached the snow it began to cloud over and get very cold. The snow was not deep however, but by the time I reached Stendarts camp it began to snow again.

The man whom I had arranged to meet did not appear, so I left my horse in an old barn and went on about five miles to the hunter's camp. I had a big feed of venison steak that night, and the next morning was a brighter day, but rather cold. I hunted over most of the mountain and returned to the barn where I had left the horse. As the shakemaker had not appeared yet, I took my horse on down to the Hunter's camp and stayed there again last night. Something scared Mike in the night and he broke his rope and started out. When I woke up this morning I did not have any more horse than a rabbit. I carried my saddle back to Stendarts, and then followed my trail on out thinking that the horse would return to camp. He has not appeared yet so I suppose that I have several days' walk laid out for me hunting him up. It was so cold up there in the snow that I almost froze my feet and I think I contracted a bad case of chilblains. I will have to go back up there again, I guess, and get some more snow to cure them.

Now the most unfortunate thing about it is that I am afraid it is going to delay my trip down there for another week. I have a lot of work piled up ahead of me besides finding my horse. I am sorry for it delays just so much about making arrangements for that event in December.

I think that we had better plan on putting the date pretty well along toward the last of the month-both on account of my work here, and because it will give us more time to prepare for it.

As ever, John

November 2, 1909, Bootjack, California

I found my runaway horse yesterday after following him until four o'clock in the afternoon. I thought for a time that I would have to go clear up

to Miami to catch him, but someone caught him along the road and tied him up. I think that I shall ride him down to Fresno next week, just to have an opportunity for him to redeem himself. I shall probably leave for the valley about next Saturday or possibly Monday.

Somehow it seems that the harder I try to get away, the more there is to do. We had an excellent storm the other day, and as it has turned warm since then, it has done a world of good. The hills are turning beautiful now in their autumn coloring. We have so many oaks about our camp here that I think it makes a very pretty spot.

They are all turning a brilliant scarlet and yellow now. The warm weather has started the grass to growing too, and that means that we will probably have good pasture and plenty of feed this winter.

As ever, John

November 21, 1909, Friday night

Well, I started in to discuss my trip. I rode to the Toll House the first night and put up at the Hotel there. I started at six o'clock the next morning and rode to North Fork arriving there about two o'clock. I intended to write you from there, but I stayed with Mr. Shinn that night and he had so many things to talk about that I did not have a chance.

As usual the effect of talking with Mr. Shinn was to unsettle my plans generally. His latest development was that he was going to send me in to San Francisco to the District Office there for three or five months. This would be soon after the first of January next. However he has to get the approval of the District Office to carry this through, so the success of the plan does not look at all probable. I am telling you this, not because there is any possibility of its happening, but to give you some idea of the uncertainty of Forest Service work generally. Something of this sort may turn up almost any time to knock out all calculations you have made for other things.

I left North Fork Wednesday morning and rode through to Miami that day. I say rode through, although waded through is probably a little more descriptive term. I found snow from Crane Valley on and it made progress rather slow. There must have been about a foot of it left at Miami. I stayed at Ranger McLeod's summer camp that night. There were plenty of provisions in the house and hay and barley in the barn, so neither Mike or myself had any reason to complain about quarters.

The next morning I went over to the Grove pasture where I left my other horse. Although I had to cross nearly two feet of snow in places, I found the pasture open. The little roan was looking fine. I don't think I ever saw her any fatter. If it had not been for the trouble of making another trip back there to get her I would have left her there for a while yet. However, I brought her down and put her in the pasture near camp.

Mr. Davey had made himself busy while I was gone painting the house and fixing up around the place. We have the fire-place almost completed but have not had a chance to test it with a fire yet. We hope to get it fixed up and most of the house finished inside by the middle of next month.

You are certainly missing some beautiful sights by not being here now. The oaks at our place are right at the height of their autumn coloring. We have a view of the mountains where the oak and pine are mixed, and it is certainly a contrast to see the golden and scarlet leaves of the oaks among the green pine needles.

The Forest Service of this era was probably the most military-like of any civilian government agency. Personnel were moved about constantly, sometimes with little regard for family situation. If an employee didn't like it, there was usually only one solution—quit! Miller showed some gumption when he told his supervisor that he would spend the winter on his district, in the house he had built, thank you. But then Shinn came up with another idea—send Miller to District 5 headquarters in San Francisco for the winter.

November 25, 1909, Tuesday night

We are having an awful time at our camp keeping the work going. Something keeps coming up to interfere with our work on the house, so that it is hard to accomplish much. We have three or four days work left yet on the fire place and then we have some papering and inside finishing yet to do. My pardner is going out on his vacation the first of December and will be gone 12 days so I will have a hard time getting very much accomplished before I leave as there is always other matters coming up to take the District ranger's time.

Most of Miller's letters now are discussions about arrangements for the soon-to-be-wedding in Parlier, California. Most of the discussion was about how rapidly they could catch a train for San Francisco to get away from

the small town. Miller was no longer very chatty about work. His mind was elsewhere.

November 29, 1909, Saturday night

Dearest:

I got your letter last night just before I was leaving to go down to Boothes' for supper. We were asked down there for Thanksgiving dinner but it rained so during the day that we did not try to go. To keep them from taking offence, we went down there and spent yesterday evening. Their oldest son is there for a few days. He is a district ranger down below the Toll House and was married a few days ago to a girl in Tuolumne County. The bride seems like a very nice girl, and is a sister of Will Parkinson, the ranger whom I was with at Shaver last summer. I think they left today for their home camp.

We were feeling very well satisfied at our camp tonight as we at last have a big fire going in the fire place. The chimney is not quite completed, but we at least have it far enough along so that we can keep warm. One advantage of it is that it is big enough to hold a lot of wood, and I guess that we will have plenty of wood on this place to last us for a while yet.

So you got my letter a day ahead of time! I guess that was because it was mailed in Mariposa instead of our mail box. I was down in Mariposa last Saturday. We drove down with our team and brought back a load of provisions.

Sunday afternoon

I have about forty other letters to write this afternoon, but I am going to finish this one first. I got sleepy last night and got to talking afterwards with Mr. Davey, so that I did not accomplish much in the line of letter writing.

This has been another beautiful day. Last night we had a fog up here—something that rarely happens. It cleared away by morning though, and I think that you were getting your share of it down on the plains then. I imagine you are having some of Fresno's famous fogs from the looks of things below.

I had to stop just now to talk to Mr. Shinn on the phone. He brought up the San Francisco question again and said that he was going to try and make the arrangements for my going in. I hardly know what to expect, but in any case don't care much one way or the other. He will have to get the authority of the District Office first and that is something that I am skeptical about. I shall certainly plan on staying here as the San Francisco arrangement would only be temporary anyhow.

The detail to the District 5 office in San Francisco (now Region 5) keeps cropping up. Supervisor Shinn sounds a bit insensitive to a sensitive time in one's life—getting married. He surely knew of Miller's impending marriage.

November 30, 1909, Monday night

Your letter of Thursday came in this evening and I have just finished reading it for the second time. It really must have been exciting to watch a football game in the rain. It reminds me of the time when I used to play. I certainly missed seeing the game this fall. But then I have so many other interesting things that I hardly have time to think about football.

We finally finished our chimney today and I am certainly glad of it. It has been a pretty big contract. But then I guess that it will be worth all the trouble. It works fine and I am sitting before a big bed of coals which make the room seem cheerful. A fire place always seems to afford an air of comfort and cheerfulness to any sort of house. We might have built a better looking one than we did, but we had to do the work ourselves and we were more interested in getting something that would keep us warm than we were in looks.

We are having lovely weather now. There are light frosts in the mornings but the days are warm and sunny. I am afraid that you are hardly so fortunate down on the plains, as I can see a bank of fog out over there all day. We have not had a foggy day here yet.

The reference to Miller having played football was probably referring to high school. As mentioned earlier he was an avid Stanford football and sports fan.

December 3, 1909, Thursday night

It is so cold tonight that it is a hard matter to get far away enough from the fire to write this letter. I am afraid that it will have to be brief and of not very much interest to you as I have to get up at three o'clock tomorrow morning and there is not very much in the way of news to tell.

We have been having some very rapid and noticeable changes of weather during the last two days. Tuesday was a pleasant day and I went to Mariposa. Yesterday it began raining in the

J.M. Miller family

Figure 19—Rangers' convention, North Fork, Sierra National Forest, 1910.

morning and rained nearly all day. I went down to the Magoon pasture to catch the roan horse, and it sprinkled nearly all of the time. We got back to camp by noon and then it began to rain. It was a regular downpour and it kept up until this morning.

Today we had some surveying to do and that kept us busy until four o'clock this afternoon. While we did not have to work in the rain, it was very cold and cloudy. I thought all the time that it would snow but it didn't. I guess the storm is over though by this time and I hope it will be clear by tomorrow morning. Mr. Davey is going over to North Fork to go out on his vacation. I have to go to Signal Peak, and as he is going to start at 3 o'clock, I think that I will get up and go with him part of the way.

December 5, 1909, Tuesday night

It seems as though Jupiter Pluvius has started in to give us our share of storms this winter. Yesterday the thermometer did not rise above freezing and in the evening a strong wind came up and it began another snow. Instead of getting colder this time, it turned warmer and before morning, settled into a rain.

Well, I suppose that all this discussion of the weather does not particularly interest you. If you were here you probably would be interested as one has to be prepared to go from warm spring-like days to cold wintry weather with everything as white with snow as though Santa Claus were coming.

If you were here you would probably make me change my mode of living too. I do hate to go to the trouble of cooking when I am all alone, and I haven't built a fire in the cook stove since Sunday. I simply camp in here around the big fire place like an Indian. I rather like it, both because it seems like camping out, and because it is so much more comfortable than building another fire in the kitchen.

I took some more pictures yesterday, and hope to have enough to send away to be developed by the end of the week. Snow pictures are pretty, I think, if they are successful.

December 7, 1909, Thursday night

Our siege of bad weather is getting tiresome and I would like to see it stop some time. I have been able to do nothing all this week but rustle wood for the fire and a little office work. This afternoon I went out for a few hours and worked on the telephone line.

This morning about four o'clock, I woke up and was glad that our house is up on a hill. Even as it was, I began to consider building some sort of an ark before the water should come any higher. For about two hours the rain came in a steady downpour. It was a warm rain and carried the snow with it, so that by daylight every small stream was a raging torrent. Fortunately the drainage is good here so that no damage was done but I am afraid that something must have happened down below.

> Yesterday my pardner cut his foot, and I have been exercising my medical skill to his great sorrow. By my "pardner," I mean the yellow pup who is a great deal better than no company at all. He is in the irresponsible stage yet, but will make a good dog when he gets older. He ran into a saw lying in the snow and nearly split his front paw open, but I think that it will heal without his going lame.

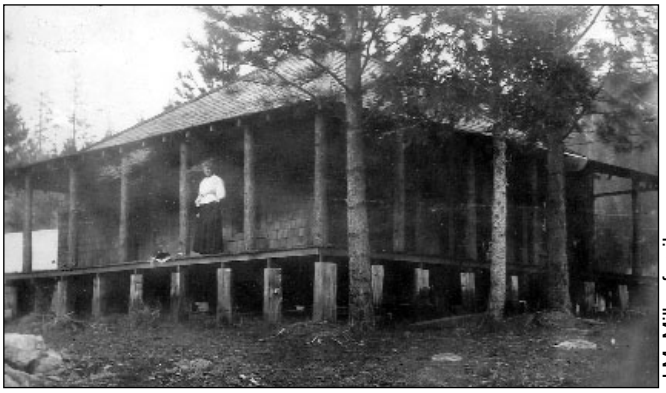
Miller's last letter to Bessie was on December 15, 1909 and was full of plans for the wedding that he would be departing for within a week.

This was the end of Miller's letters for 1909. After he got married on December 23, 1909, the letters were infrequent except for several when he was working near Yreka, California. Miller's life and career was about to change in 1910, perhaps more drastically than he could have imagined (fig. 19).

Chapter 7: Miller Starts Entomology Work With the Forest Service, 1910

"Married on the morning of December 23, 1909 and after the ceremony at Brose ranch left for San Francisco." This short passage in John Miller's diary marked a change in his personal life, and as the New Year progressed there was a major change in his professional life.[1]

After the private wedding ceremony at his in-laws' home, the newlyweds left on an afternoon train to San Francisco. John and Bessie had been planning their wedding for months via correspondence, but much of the planning seemed to revolve around how private the wedding could be and how quickly they could depart for San Francisco. And the trip to San Francisco was not for an extended honeymoon. Miller immediately took 2 weeks of leave in Palo Alto at Stanford University to work on an "Insect Report," and prepare for a planned entomological survey on the Sierra National Forest (fig. 20). During this period he also visited the District 5 office at least once.



J.M. Miller family

Figure 21—Mrs. Miller at Cummings Ranger Station, 1910—their first home. This is the cabin the crew built as described in chapter 6.

J.M. Miller family

Figure 20—Mrs. Miller on horseback during honeymoon trip. Miller was checking bark beetle infestations in the southern Sierra Nevada Mountains, 1910.

On January 7, he reported to the District office and worked on Sierra Forest Boundary reports with Roy Headley, chief of operations, and he "worked out a circular for supervisors instructions on collecting insects" to be used for Forest Service Personnel.

He worked in the District office for the chief of Silviculture and office of operations under Headly until January 22, when he and his wife left San Francisco. By January 23, he had returned to the Cummings Ranger Station to resume his duties as District Ranger.

Obviously something else was in the works for Miller during the coming field season. He had spent a lot of time at Stanford and San Francisco preparing insect reports, gathering entomology publications at the Stanford book store, and setting up some insect collecting criteria for field rangers in District 5.

After returning to the Cummings Ranger Station (fig. 21), he did a lot of wood chopping and hauling to keep his new home warm. But he also worked with his Forest Guard, Davey, through the remainder of January, all of February, and March on grazing examinations, trail building,

[1] Miller's letters were rare after his marriage, but all forest rangers were required to keep a daily official diary. The diaries were saved by John Miller's son Harold (Dusty) Miller who also served as a forester on the Sierra National Forest at North Fork, California. His daughter Susan Miller Lowenkron was entrusted with them until she gave them to me for writing this book.

boundary surveying, fence building, and checking settlers' property claims. According to his diary, he worked 6-day weeks and spent at least part of many Sundays writing and filing reports and letters. With Miller's inclinations toward biological research, such a schedule must have been onerous. Especially demanding was a grazing allotment map for the district that Supervisor Shinn desired. This task took weeks according to his diary.

March 8-11 Miller led a Forest Service trail crew to set up a camp on the Merced River below El Portal. An interesting camp supply list with prices was included in his diary as follows:

"List of provisions for trail"

1/2 sack flour	$1.25
6 cans milk	$.60
20 lbs. spuds	$.80
10 lbs. sugar	$.15
1 lb dried peaches	$.15
5 lbs beans	$.40
1/2 roll butter	$.40
1 3-lb bucket of honey	$.25
3 loaves of bread	$.10
2 bars soap	
	$4.75

Unless they were planning on catching a lot of trout in the Merced River or shooting a deer, this sounded like pretty skimpy fare for a three-man crew. Perhaps every man was required to bring his own camp food and this was just Miller's larder. The diary also indicates they "got powder from the Hite mine," indicating another skill the rangers needed, rock blasting during the trail building.

On March 17, Miller returned to El Portal to inspect the trail work, get the crew's time, and take them supplies. He found that they had used "50 lbs of powder, need 50 lbs more, also butter and canvas."

Finally on March 22, Miller was able to get back to his "insect report, mounted several specimens and took pictures." But the next day he was out riding a telephone line and repaired it in several places. On March 25 it stormed all day so he delayed his trip to the El Portal trail crew and mounted (pinned) insects all day. The 26th he packed barley (for horses) and supplies to the El Portal Crew.[2] The next day, Sunday, March 27, 1910, "Went to top of Pinnoche [sic] Mountain to look over work on trail to old Mexican mine—decided to abandon work and transfer trail money to Devils Gulch [Trail]. Returned to camp Cummings in a snow storm."

For the next several weeks Miller alternated between working on his insect collection and repairing telephone lines. By April he was out looking at insect infestations for the first time in the season. "Wednesday, April 13, 1910, worked in office in a.m. writing letters to Professors Doane and Kellogg—mounted insects collected the previous day." By the next day he was back to counting cattle on the range and trying to get stockmen to pay their range fees. On April 18, Miller had a bad toothache all day. He could not find a dentist locally so had to take the stage to Reedley where he had "two teeth extracted and some repaired." The medical trials of rangers in the field were notorious. Not only that, but because of the transportation problems, he had to take 4 days of sick leave. When he got back to the Sierra National Forest headquarters at North Fork on Sunday, April 24, he spent the morning talking to Supervisor Shinn and then went target shooting in the afternoon. Forest Rangers were supposed to be proficient marksmen (Davies and Frank 1992).[3]

On April 30 Forest Guard Clark arrived as Miller's assistant. Clark was being trained to act as Ranger for Miller during the planned insect survey so pretty much shadowed him for most of May. On May 19, Miller packed up his entomological supplies and household goods. "May 19 started for North Fork with outfit consisting of wife, 3 horses, 1 dog, and various incidentals. Reached the Buford Camp that night." The Millers went on to South Fork so John could have a last conference with the supervisor before he started his entomological detail examining the Sierra National Forest for insect-damaged forests.

[2] This is what he took to the crew: 25 lbs. potatoes, 5 packages of salt, 50 (?) Star tobacco, 1 sack barley, 1/2 doz. cans tomatoes, 10 lbs. sugar, 5 lbs. dried apricots and prunes, 1 gal. syrup.

[3] Part of the field tests in 1905 on the Klamath National Forest required shooting at targets with a rifle at 100 yards and pistol at 50 yards. It didn't say whether they had to hit the target.

Bess took the train and part of the outfit to Reedley, but John rode horseback to Reedley with their camp outfit. Then they traveled to Visalia, to Porterville, and to Hot Springs over the next several days that were hot and disagreeable. It must have been bad because the page for May 30 has been torn out of the diary. But it was the start of an interesting wilderness pack trip to survey and report on all national forest lands in the southern Sierra Nevada. Shinn's promise to Miller finally came true. It also appeared to be a combined work trip and delayed honeymoon for the Millers.

The months of June and July were spent riding, packing, camping on the southern part of the Sierra National Forest including parts that are now part of the Sequoia and Kings Canyon National Parks and the John Muir Wilderness. Bessie was more than a tagalong; she cooked, washed, watched the horses, and, interestingly, kept part of the journals. It must have been agreed that in order to free John for collecting insects and keeping biological notes, Bessie would keep the travel journal. Thus there are two diaries for this period. John's would be interesting to an entomologist, but his scrawls are practically unreadable and mostly noted insects collected, counts of bark beetle larvae, etc. He must have had entomological shorthand. Some of Bessie's entries are included here because they introduce some important new colleagues that Miller was associated with for many years. And, some entries illustrate the trials and tribulations of horsepacking in 1910.

Diary of Bessie and John Miller

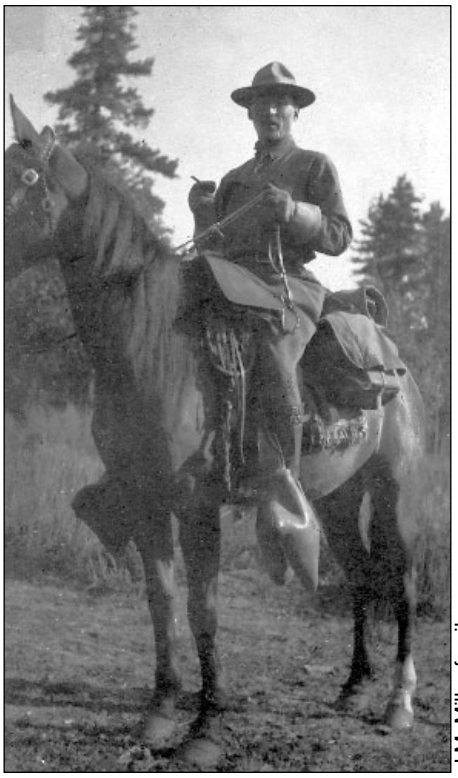
June 9, 1910
At Loyd Meadows John inspected some dying timber and took some pictures. I stayed in camp and washed. In afternoon Dr. Meinecke[4] and ranger Kelly arrived and camped for the night [fig. 22].

June 15,
Camped at Rifle Creek. John fished in morning (got 4) and in the afternoon took pictures of dead timber. I stayed in camp and cooked—provisions down to bed rock. John went fishing in the evening and did not come in till late. I got uneasy about him and started out with rifle on my back to look for him—met him with string of 12 fish.

June 16,
Camped at Rifle Creek. John walked 5 miles to look at some dead timber and when he reached it found out fire instead of insects had destroyed it. I stayed in camp and watched the horses. Turned them loose at noon and they struck out over the hill, hard time catching them again.

June 17,
Packed up and made it through Farwell Gap down to Mineral King. Shoveled path through snow in the Gap and were 6 hours coming through Gap to Mineral King. Old Bachelor Stephens took us in and treated us kindly giving us our meals while in Mineral King.

June 25,
John went to Breely and I stayed at Hopings [Hoppings']."[5]



J.M. Miller family

Figure 22—E.P. Meinecke camped with the Millers several times during their 1910 honeymoon trip.

[4] Dr. E.P. Meinecke was born in San Francisco and died there in February 1957 at 87 years of age. He was educated in Germany and is considered the pioneer forest pathologist in the West. He spent almost all his career in District 5 (Region 5) and became a close friend and collaborator of Miller. Together, they often visited forest areas having tree mortality problems.

[5] Ralph Hopping was stationed in District 5 San Francisco and was in charge of insect control in the District. Miller probably met him in 1908 or 1909. They became friends and colleagues jointly visiting many insect outbreaks in the District. There will be more about Hopping later in the story.

June 26,
At Hoppings in morning, afternoon Clair and I went up to meet the men. Rode through Grant Park [eventually a National Park].

July 2,
Stayed in camp. John in camp in morning, afternoon went out collecting with the Dr., Hopping and Derby. Between them carried whole tree into camp.

July 3,
Stayed in camp and baked bread. John dug bugs out of bark most of the day.

July 4,
Broke up camp and came as far as Big Meadows in the morning. P.M. John and the other three went out collecting and I stayed in camp. Sierra Club's pack train came through and got mixed up with our horses.

July 16,
Left Simpson Meadows and came over the Tehipite Trail to Tehipite. Terrible trip. My horse fell hurt her leg. Mule fell had to be unpacked another mule over the precipice almost killed himself. Delayed two hours digging him out. Killed 4 rattlesnakes—hard time finding a suitable crossing in the river. Scenery magnificent!"

July 17,
Left Tehipite came to Gnat Meadows and stopped for lunch. Caught in thunderstorm. Came on to Crown Valley, rained all evening. Ate supper with rain pouring on us. Tehipite Trail a fright!

July 25,
John left early in the morning for Ellis Meadows. I got up early got his breakfast and there at six o'clock took the stage for Fresno. Forgot my tie and Dr. Meinecke gave me one of his.

When their trip ended at North Fork the end of July, Bessie went home to her folks' home in Reedley for awhile to help prepare for her sister-in-law Clara's wedding. She rejoined Miller on August 11 as he continued his entomology work on the north end of the Sierra National Forest. He made copious notes in his diary, about his insect collections.

Miller rode to Reedley on September 1 and from this point, I don't think Bessie was with him in the field. On September 4, Miller arrived in Palo Alto "saw Burke, Doane and Mann. I made arrangements with Doane to send in specimens for rearing and storing." At this date, Burke knew that Miller was doing forest entomology work and had official Forest Service orders to survey, collect insects, and make entomological reports for the Lassen and Klamath National Forests. What Miller was doing was a little irregular and, according to Hopkins, impinged on the supposed responsibilities of the Bureau of Entomology, Division of Forest Insect Investigations.

For most of September, Miller traveled to insect infestations (mostly mountain pine beetle in lodgepole pine) on the Lassen National Forest. He collected insects and wood-borer-infested wood and made observational notes of tree damage. He also sent back material to Doane at Stanford University for rearing and he started what he called "experiments," cutting down infested trees and counting insects under the bark in the upper bole.

His diary notes the following:

September 22 worked on Lassen Report. Wrote to Baldenweck, R.A. Teet and Case [names unknown to me]. September 23 sorted out specimens, wrote to Stanford bookstore, A.D. Hopkins, and Mann. Mailed specimens for identification. [to Hopkins?]

September 27, examined 180 cones drying at Crocker R.S. splitting them open and found 76% infested with worms.

By now Hopkins must have known that this Forest Service Ranger, John M. Miller, was doing **entomology** work in California! And there was more to come in October and November.

Miller remained on the Lassen until October 19, writing reports, taking some field trips with forest pathologist Dr. Meinecke, complaining about some eye trouble, and writing to Ralph Hopping in District 5 headquarters. Hopping will enter the story a little later.

Miller's next move was to continue his entomology work on the Klamath National Forest. His itinerary follows:

October 20, stage to Truckee, October 21, train to Nevada City, October 23, night train to Sisson [Mount Shasta], October 24, to the Headwaters of the Sacramento River with Rangers, October 26, Hummingbird Ranger Station to Fawn Creek, October 27, collected near Sisson and road to McCloud, October 27, to Yreka.

All of this travel could be done in one day by auto now.

On October 31, Miller went with Klamath Supervisor Rider and Deputy Supervisor Hall to Glendinning's ranch on Moffett Creek to examine dead yellow pine [ponderosa pine]. They found trees being killed by western pine beetle, *Dendroctonus brevicomis*. (This area was to become the next bark beetle control project in the West and will be the subject of the next chapter). However, Miller still had several more weeks on the Klamath Forest with some interesting diary entries concerning his work. He remained at Glendinning's ranch for several more days to select trees for cutting [his experiments] and observed a small woodpecker apparently feeding on bark-beetle-infested trees. He next went to Humbug Creek and took photographs. On November 7, he corresponded with L.O. Howard, Chief of the Bureau of Entomology, who was Hopkins' superior. On November 8, he "talked to Attorney Taylor at Yreka, who was representing Moffett Creek Lumber Company. He said his company was willing to cooperate on control of beetles." November 10, Miller was in the Sisson office working on expense accounts and reports, then left on the train for Sacramento. The next diary entry is very significant.

> November 11, could not leave Sacramento on train so went down to State Capital and interviewed Assistant State Forester Hodge in regard to the insect infestation on Moffit [sic] Creek. Hodge favored the project as mainly for state supervision. "There is very little prospect of treating the entire territory as a matter for Forest Service supervision." Left Sacramento 10:10 am, reached Fresno at 6:10 pm, stayed at the Grand Central.

By now A.D. Hopkins must have been getting anxious about the number of nonentomologists who were players in his self-described domain.

This was pretty high-powered control policy for a young district ranger on a detached work detail to be discussing with another agency. My guess is that Miller had approval from the District 5 headquarters, namely, Ralph Hopping, to represent the Forest Service. By November 15, Miller had returned to North Fork, but he did not resume his district ranger duties. Instead he selected some trees for "experimental work" then went on annual leave. On December 3, 1910, he set up a laboratory at Stanford University. On December 9, he gave a talk to Professor Doane's forestry class and on December 11, worked on a paper to give at the forest supervisors' meeting to be held December 12-17 in San Francisco. With time out for Christmas, he worked on his insect collection until the end of the year.

For the next 2 months, Miller was on detached duty at Stanford University, Palo Alto, working on his insect collection, rearing material he had sent to Doane earlier, working on the Klamath National Forest report (Miller 1911; the earliest report I know of concerning a forest insect outbreak in California national forests) and, significantly, writing to A.D. Hopkins and sending him insect material from "lot 171." He also was preparing an insect manual for rangers. Miller was for all practical purposes the District 5 entomologist long before any other Forest Service districts had such a professional.

Miller was at Stanford until the end of February 1911, then mysteriously his diary ends, and we (the family and I) can find no other diaries by Miller for this year. As this is the only gap in four decades of Miller's diaries, he might have purposely destroyed the last 10 months of his 1911 diary because of some unpleasant controversies that developed over his entomological work as a Forest Service employee. However, one of Miller's rare letters to his wife after they were married written May 2, 1911, from Yreka, California, states, "I am mighty glad to think that I can get out again and camp out. I think that we will have a pretty jolly crew, with the Supervisor (Rider) two forest assistants and three rangers. This is to be the 'bug' crew with Miller in charge. I don't know what old A.D. Hopkins will say when he hears what I am doing, but I don't care much." If this is what Miller was writing in private, there must have been some controversy developing between his role with the Forest Service and Burke's with the Bureau of Entomology. Miller's next letter on May 11 indicates he has plans for continuing his forest insect surveys during the summer.

Camp No. 3, Tuesday night

My Dearest:

I will have to write a few lines tonight as the mail goes out tomorrow. I must not miss an opportunity to send out a letter at least every other day as you will get discouraged and not write to me every day.[6]

. . . Monday, I go down to Sisson in the Shasta so after Saturday you had better send your letters to Sisson care of Forest Service.

I am going out on a snow ski trip from there but I hope to get back and started for Palo Alto by next Friday night. I had a letter from the District Forester recommending my plan to the Forester for this summer's work. That is the trip on the Shasta, return to Palo Alto, the trip to Lassen in June, and then the trip to the Little Kern to study the needle miner after July first. I certainly hope that this plan goes through.

I have been out in the cold all day and am too sleepy to write any more. I am sleeping in a barn now, so I guess that it is about time to "hit the hay."

Lovingly your husband, John

Miller's next letter indicates that Hopkins is aware of the proposed control project and is making certain that he has technical control over Miller.

Hotel Clarendon, Yreka, California, May 16, 1911

My but I was glad to get this job done and get out of the wilderness this time. I was covered with dirt and wood ticks and must have been a pretty hard looking specimen when I hit town. The waitress at the hotel refused to speak to me. I could not get a bath tub so I took a sponge bath and what was worse, I did not have any clean underclothes and there was no way of buying more. So I took the dirty underclothes that I pulled off two weeks ago and turned them wrong side out and put them on again. Tomorrow, however, I will get another new suit and this will last me until I get home.

I also had a letter from Dr. Meinecke. He says that he is thinking up new dishes for you to cook this summer. He also says that the District office is very much interested in the work I am doing up here. I rather feel that I will make a showing on the job. I also had a letter from Dr. Hopkins. He seems to give unqualified approval to this work but wants me to understand that I am following his suggestion by so doing.

Miller was such a gentleman that I think he did not go into greater detail about the professional conflicts so diplomatically summed up in that last sentence.

But the year 1911 was one of change for Burke too. He was transferred to Yreka effective July 1, and arrived July 8 to set up Forest Insect Station 5. He explains the Hopkins-Miller situation very clearly in his memoirs.

[6] None of Bessie's letters to John seem to have survived.

Chapter 8: 1911-1912, Year of Change—Miller Joins the Bureau of Entomology; Burke Heads the Yreka, California, Project

During the period in 1910 and 1911 that Miller was scurrying around California national forests making insect collections and surveys, Burke was in charge of the Northeast Oregon Project, and Hopkins was preoccupied with convincing Chief Forester Graves that he and his staff were the insect experts and the Forest Service should defer to the Bureau of Entomology in all matters concerning insects. Both organizations were young and in the process of establishing their own operating procedures (Miller 1911). Turf was to be identified, fenced, and protected. Luckily, Graves was very much the gentleman and had an ecological interest in forestry. (Photographs in my possession show him on field trips and camping with forest entomologist Edmonston evidently enjoying the experience.)

Hopkins was another matter. Correspondence indicates he could be quite controlling when his ideas were questioned or his authority challenged (Furniss 2003). He was, however, the consummate politician and he was very careful not to alienate his superior L.O. Howard, Chief of the Bureau of Entomology or the Chief Forester, Henry Graves. He and Graves had at least a gentleman's agreement about respective responsibilities of entomologists and Forest Service Rangers. It was negotiated successfully in District 6 on the Northeast Oregon Project, but now it was rearing its head again in the form of Miller in District 5. The man mainly responsible for this was Ralph Hopping who disagreed very strongly with Hopkins concerning his "Percentage Control Principle," that Hopkins had recently advocated on the Northeast Oregon Project (Burke and Wickman 1990). Hopping had administrative authority for insect control in District 5 and it seems he was trying to establish some turf of his own. Hopkins was not easily cowed by Hopping as Burke's memoirs indicate. The solution to the Miller imbroglio was simple—don't fight his insect surveys in the Forest Service—get him transferred to the Bureau of Entomology. How this came about is not documented because Miller does not mention the transfer in his diary or letters to his wife.

H.E. Burke, PSW

Figure 23—Forest Insect Field Station, Yreka, California, 1911-1912 office and laboratory.

Burke's memoirs continue with the next bark beetle control project on the Pacific Slope.

The Station at Yreka, California

On July 1, 1911, I was placed in charge of what was to be known as Forest Insect Station 5 to be located in California. The old mining town of Yreka was selected as the point at which to set up a field station because of the interest in western pine beetle control which had been shown by timber owners in the vicinity. Soon after July 1 the Baker Station was transferred to Edmonston and I moved to Yreka, arriving there on July 8. As soon as arrangements could be made, a dwelling house near the edge of town was rented for office and laboratory use. Accompanying me on this move from Baker to Yreka were Bureau agents, A.G. Angell, J.D. Riggs and J.J. Sullivan. These men were on temporary appointments, but later took Civil Service examinations which qualified them for the position of Entomological Ranger [figs. 23 through 25].

Angell was employed by the Bureau for one year only. He was a cruiser with the Forest Service in the 1911 spring control work of the Northeastern Oregon Project. Appointed as an Agent July 1, 1911, he spent most of the next year attached to the Yreka station. He was the Bureau representative on the Moffatt [sic] Creek Control Project during the winter and spring of 1912 and during May and June was detailed to Baker to make a cruise of the North-eastern Oregon control areas. He afterwards became a Ranger on the Whitman National Forest and made a name for himself by organizing a

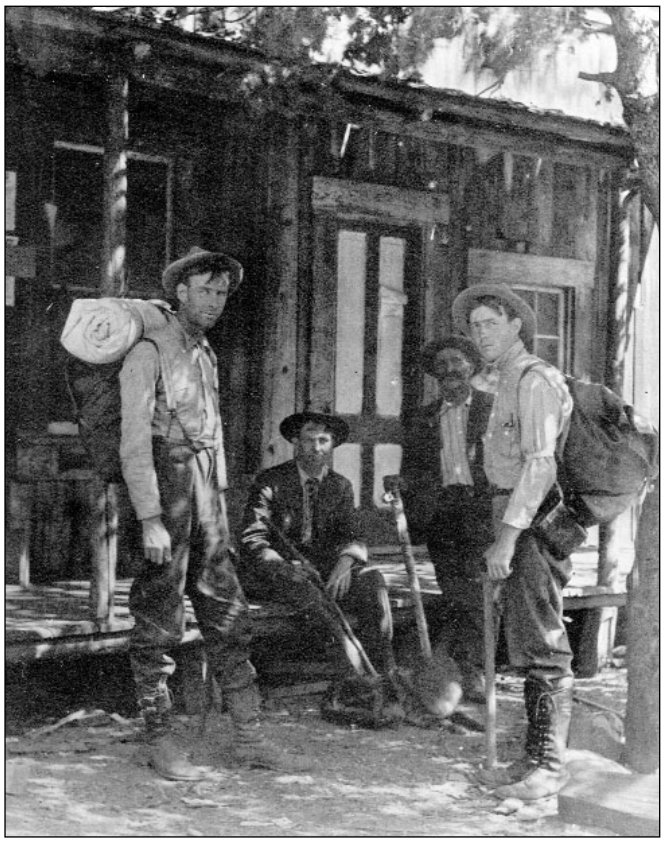

H.E. Burke, PSW

Figure 24—Entomological rangers, J.D. Riggs, (right) and J.J. Sullivan at Cecilville, California, starting on reconnaissance of Salmon River County, September 1911.

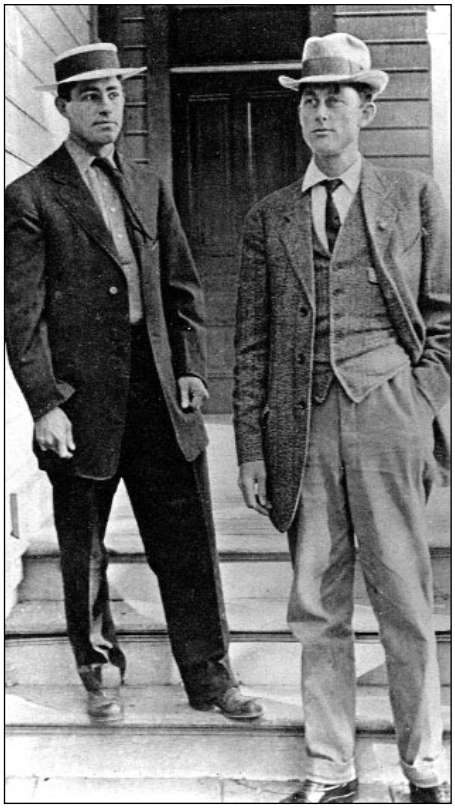

H.E. Burke, PSW

Figure 25—A.G. Angel, agent (left) and H.E. Burke, entomological assistant in charge of station, October 1911.

cattlemen's cooperative association that really cooperated. Later he was attached to the Supervisor's headquarters of the Whitman at Baker and then to the North Pacific Region headquarters at Portland where he had charge of the CCC work for the Forest Service. I believe that he died in Portland in 1943.

J.D. Riggs was camp foreman for the Forest Service on the Northeastern Oregon project and with the Forest Insect Station 5 at Yreka, Placerville and Ashland from July 1, 1911, until about August 1, 1916, when he resigned to go into mining. J.J. Sullivan was a woodsman for the Baker Forest Protective Association in the 1910 fall control work for the Northeastern Oregon Project, and a cruiser in the 1911 spring control work. He served as Agent and later as Entomological Ranger with Forest Insect Station 5 at Yreka and Placerville from July 1, 1911, to September 1915, and was then transferred to the Northern Rocky Mountain Station. Sullivan left the Bureau in June 1916 to go into lumbering [fig. 26].

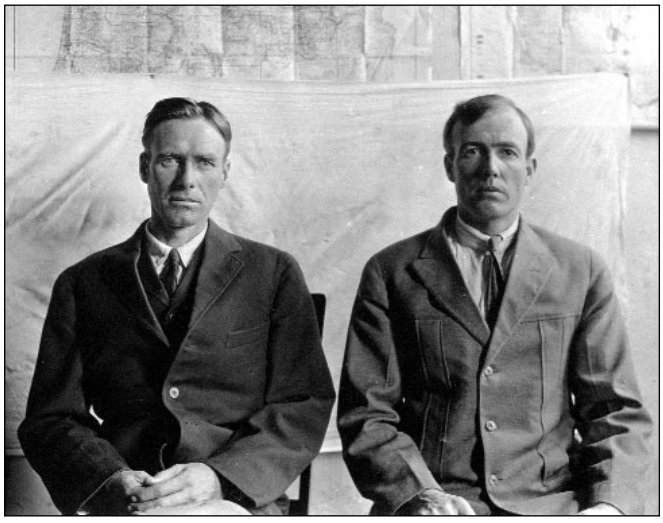

H.E. Burke, PSW

Figure 26—J.D. Riggs (left) and J.J. Sullivan.

About October 1, 1911, Forest Ranger J.M. Miller was detailed to the Yreka station by the Forest Service to assist on the control work that was being developed on the Klamath National Forest. In November Miller was transferred to the

station staff as Entomological Assistant, having qualified through a special examination for appointment by the Bureau.[1]

Although the Yreka station initiated the first large scale western pine beetle control projects, old correspondence in the Bureau files shows that at least two earlier attempts were made by Dr. Hopkins to start control in this region. These deserve mention because of their historical interest.

In 1905 Ranger Baldwin of the Santa Barbara Forest Reserve reported bark beetle infestations in the south-eastern part of this reserve. His report was referred to Dr. Hopkins who made recommendations for control measures by letter. This led up to the first recorded attempt to control bark beetles in any western area, so Southern California can file its claim to this distinction if it so desires.

The area was in Seymour Canyon on Sawmill Mountain, about 20 miles west of old Fort Tejon. The timber was Jeffrey pine and the infesting insects were *Melanophila gentilis* and *Ips oregoni*. Logging slash was supposed to have caused the infestation. Dr. Hopkins had recommended burning the infested bark and in September 1905 Ranger Baldwin undertook to carry out the control work. Eleven rangers were detailed to this job and they burned 55 piles of slash in two weeks. As the control area was a steep mountain slope and the fire season was still on, each pile had to be burned in a large pit. One of the fires got away and in the words of Baldwin "it was hell for the swampers chasing up and down the shale slopes and the fireman got pretty well blinded." Ranger Baldwin also reported, "I find in the case of slash cut after July 15 and exposed to the direct rays of sun, both larvae and in lesser degree the adult beetles are shriveled up and killed by the heat." This observation pointed toward the possibilities of using solar heat to control bark beetles, but the point seems to have been overlooked by the Bureau of Entomology as it was not until 15 years later that the solar heat method of control was "rediscovered" and given serious attention."

The next attempt to set up control work in California occurred in 1908. Early in that year, Victor S. Barber, a brother of H.S. Barber of the Bureau of Entomology, called on Dr. Hopkins in Washington to inquire about some bark beetle infestations he had seen east of Oroville, California. Barber was a surveyor who had done some work in the forests near Stirling City, California, for the Diamond Match Lumber Company.

For some time Dr. Hopkins had desired a practical man to investigate and demonstrate bark beetle control to private timber owners. Finding that Barber was acquainted with officials of the Diamond Match Company and other private owners of timber in California, Dr. Hopkins had him appointed as Agent of the Bureau in March 1908 and sent him to California to see what he could do. Unfortunately Barber did not arrive at a very good time for forest insect control work among the private timber owners.

When the Diamond Match Company started up its operation in northern California a few years before 1908, the company had employed E.A. Stirling (for whom Stirling City was named) as forester. During the first year, operation was conducted according to strictly professional forestry plans. No profits were made, however, so the next year there was less scientific forestry and more old-time lumbering. Some profits were made under this shift in program so the third year still more of the forestry program was dropped and more attention given to lumbering and profits. By the fourth or fifth year, forestry was given up altogether and Stirling left the Company to become Forester for the Pennsylvania Railroad where he remained for a number of years.

Barber arrived at about the time when forestry had been discarded and when anyone connected with forestry in Washington was unpopular. He tried to contact some of the owners in San Francisco without much success, so went back to the forests and tried to make contacts there. He made collections of bark beetles in the vicinity of Chester, California, which were later mentioned by Hopkins in Bulletin 83. However, after several months Barber concluded that there was not much chance of interesting private timber owners in bark beetle control so he quietly went into other work without leaving a forwarding address or notifying Dr. Hopkins of his change in plans. After 3 or 4 of his monthly pay checks came back to Washington unclaimed, the Accounting office appealed to the Bureau of Entomology, who finally contacted Barber and persuaded him to resign in the customary manner.

[1] This was probably the equivalent of a reassignment arranged at high levels in both organizations. Miller's diary does not give this event much enlightenment, but apparently he did not instigate it.


H.E. Burke, PSW

Figure 27—Craggy Mountain Bark Beetle Control Project. Control crew moves from North Fork Camp to Cayuse Gulch, March 17, 1912.

The control work for which the Yreka station provided the technical supervision developed during the fall of 1911 and the ensuing winter and spring into three main undertakings known as the Moffat [sic] Creek, Craggy Mountain [fig. 27] and Barkhouse projects. These projects and some of the developments which followed during the next few years largely set the pattern for a long list of bark beetle control projects that have developed in the California region. So again it seems desirable to digress from this autobiography in order to give a fairly complete story of these first western pine beetle control projects.

Moffat Creek, Craggy Mountain and Barkhouse Bark Beetle Control Projects

Had it not been for a rather sudden interest on the part of the Southern Pacific Land Company in pine losses on its timber holdings, the Station at Yreka would in all probability not have been established. As it worked out, however, this Company called the attention of the Forest Service and the Bureau of Entomology to a western pine beetle infestation on the Klamath National Forest and started action which led to control, not only on the Company's holdings but on adjacent private and national forest lands.

When the Southern Pacific extended its line from Sacramento to Portland during the 1880's it received a grant of every alternate section of land for 20 miles on either side of the right of way. While most of the agricultural land in this grant was rapidly sold, the Company held on to its timber until lumbering developments made it possible to dispose of the stumpage at a good profit. In 1910 it still held many sections in Northern California awaiting logging developments.

About 20 miles south of Yreka was the center of the Moffat Creek area where railroad sections were checker-boarded with other private timber holdings. The stand of timber covered about 10,000 acres and contained around 150 million board feet. To protect this timber from trespass and fire the Company employed as its agent, W.E. Glendinning, who owned and lived on a quarter section in the heart of the Moffat Creek basin. Glendinning was an observant individual and during the summer of 1910 he noted that a number of trees were dying from some cause other than fire. He corresponded with G.M. Homans, then State Forester of California, who sent William Hodge, Assistant State Forester, to Moffat Creek to investigate conditions.

Hodge and Glendinning examined a number of recently dying trees in the area, chopped into the bark and decided that the mortality was due to bark beetles. This conclusion was in line with that of Forest Assistant S.T. Dana who had made a silvical study and report upon the Klamath areas in 1908.[2] Dana had observed scattering yellow pine infested with the western pine beetle all over the Forest and surmised that "a succession of favorable seasons might cause a great deal of damage, but all we can do at present is to watch for developments." Glendinning and Hodge estimated that the amount of dying timber in 1910 had increased about 50 percent over that in 1909 so it was evident that something was developing in the Moffat Creek area.

Hodge reported conditions to the Regional Forester of the Forest Service in San Francisco, who detailed Ranger J.M. Miller to make a further examination of conditions in Moffat Creek and nearby national forest timber. Miller and Forest Assistant Jesse R. Hall of the Yreka office made a trip to the Glendinning ranch in November 1910. Although they found that the western pine beetle was doing a considerable amount of damage in this area, national forest lands were not involved to any extent. The Forest Supervisor, W.B. Rider, then suggested that an examination be made of areas west of Yreka where large acreages of national forest timber interlocked with those of the Southern Pacific Land Company. Miller and Hall went over certain of these areas, mainly the watersheds of Big

[2] Samuel T. Dana worked for the Branch of Silvics in the Forest Service until 1918 and then went on to a distinguished career as chief of the Research Branch in 1920. In 1921 he was appointed Forest Commissioner of Maine. In 1923 he rejoined the Forest Service as director of the Northeastern Experiment Station. He next became Dean of the School of Forestry at the University of Michigan.

Humbug Creek and other tributaries of the Klamath River, and found conditions quite similar to those on Moffat Creek.

Miller made a report on these examinations to the Forest Service in January 1911 in which he attributed most of the loss that was occurring to the western pine beetle, but also called attention to flatheaded and Ips infestations and to the decadent conditions of certain pines which appeared to be dying slowly. This report and some of the correspondence regarding the Klamath situation reached Dr. Hopkins through the Forest Service office in Washington. Dr. Hopkins had not previously been informed of this activity and he immediately wanted to know what Miller was doing and why he was making examinations under the pretense of being a qualified entomologist and without the approval of the Bureau of Entomology. He requested that the Forest Service cease these goings-on until he could look into the situation first hand; so the matter rested until Dr. Hopkins made his western trip in April 1911. After inspecting the Northeastern Oregon project, he went to Yreka where he was met by Miller.[3]

Dr. Hopkins first wanted to see the Moffat Creek area and talk to some of the private owners so he and Miller hired a team and drove out to the Glendinning ranch. A day spent in going over that area convinced Dr. Hopkins that this area presented a good opportunity for a demonstration control project. He was impressed with the infestation and the interest shown by the private owners. He decided immediately that Yreka was the place to locate a field station to further this project.

On the return to Yreka Dr. Hopkins found that the Forest Supervisor was lukewarm toward control work in Moffat Creek. Mr. Rider argued that the Klamath River areas in the Big Humbug and Barkhouse creeks would provide the best conditions for the Forest Service to participate in a demonstration project, because of the large holdings of government-owned timber. Dr. Hopkins remarked that the Forest Supervisor's proposals looked like a "Big Humbug" to him and left Yreka without reaching any understanding with the Forest Service; but he was determined to go ahead with his plan of locating a field station at Yreka in order to develop control work among the private timber owners.

After Dr. Hopkins left for Washington, Mr. Rider decided that more factual information was needed on conditions in the Forest Service areas. He assigned Forest Assistant A.D. Hodson [A.H. Hodgson] to make a survey with Miller's help and three rangers were added to the party to make up a timber survey crew. Five sections were selected in the Barkhouse Creek area where losses seemed to be heavy and 10 percent cruise made of both the dead and green stand. In addition all infested trees were located and mapped. Although the term "spotting" originated on the Northeastern Oregon project, it became officially established on this survey to describe the activity of marking and mapping infested trees. Hodson [sic] prepared a report which showed that the accumulated loss in this area had been very heavy on some sites and that an average of 30 percent of the original stand had been lost on the area cruised. This study was completed early in May 1911 (Hodgson 1911).

After I arrived at Yreka in July 1911 preliminary surveys were started and carried on during the fall on a basis for control plans, not only for Moffat Creek but also in the Big Humbug and Barkhouse areas.

The first control work to get underway was in the Big Humbug Creek drainage. The name of this project was changed to Craggy Mountain in order to lend a little more dignity to the title. The Southern Pacific Land Company agreed to pay for the cost of treatment of trees spotted on its land. The Forest Service proposed to handle most of the cost of contributed labor of its year-long men. The Forest Supervisor was sold on the idea that it was a good thing for his rangers to have something to do during the winter season and "bug work," as it was soon termed, seemed to offer a good outlet for pent-up energy. About 10 men altogether, consisting of District rangers and guards, were called in and assigned to this project. The Forest Service set up a camp and paid for their subsistence.

The camp was moved into the Big Humbug Ranger Station on January 5, 1912, and work was started with about two feet of snow on the ground. Riggs, Miller and Sullivan were assigned to the camp to do the spotting, supervise control methods, and keep a detailed set of records. The work was new to all of the crew but they were fairly enthusiastic. The Craggy Mountain area was completed on March 22 and on March 25 the camp was moved into Barkhouse Creek where the work continued until April 24.

[3] Miller makes no mention of this meeting other than the May 16, 1911, letter quoted in the previous chapter.

H.E. Burke, PSW

Figure 28—Infested tree felled with powder. Most of the men hired on this project were local ranchers and miners. These men knew how to use blasting powder and figured that it was easier to shoot down infested trees than saw them down. Tom Lane, a member of the crew, had a box camera and wanted a picture just as the blast exploded. He lashed his camera to a stake, 15 feet from the tree, tied a string around the tree at the height where the blast would occur and attached one end of the string to the camera shutter. The picture was a success, but the front part of Lane's camera was wrecked.

> For a good part of the time the Craggy Mountain camp was in charge of Forest Assistant Shirley W. Allen.[4] Allen was not only a good camp foreman but he had the happy faculty of keeping the crew in good humor. His songs, jokes and irrepressible good nature went far toward keeping up morale during the bad weather in January and February which interrupted progress of the work. His "Bug Song" to the tune of Casey Jones became a classic among the natives of the Klamath River Country.[5]
>
> Oh, we've chopped 'em all down and you can't find a beetle.
> We've burned 'em all up and you can't find a bug.
> We treated all the trees so you can't find a beetle.
> No, you can't find a beetle on the Big Humbug.

[4] Allen later became a professor of Forestry at the University of Michigan.

[5] The full set of lyrics to this ditty can be found in Davies and Frank 1992: 52-53.

As this was the first project concerned with the western pine beetle, a number of experimental phases were added to it. Time and cost records were kept to determine the most economical methods of treating infested trees. Among the ideas tried out were the use of blasting powder to fall the trees [fig. 28], the use of saddle horses to get men out to the more isolated trees, and the employment of small mobile camps composed of 2 or 3 men each instead of one central camp. None of these ideas turned out to be very efficient.

The Moffat Creek project got underway March 14 and continued until May 10, 1911. It was financed entirely by the private owners on a cooperative basis with W.E. Glendinning supervising the work. Agent A.G. Angell was assigned from the Yreka station to assist on the project and give it technical supervision.

A report upon all three projects was prepared in June 1912. This shows that 544 infested trees were treated on the Craggy Mountain area, 383 on Barkhouse and 373 on Moffat Creek, totaling 1300 trees with a volume of 1,772,000 board feet.

Some interesting developments followed the initial work on the Klamath areas. In the fall of 1912 the Craggy and Barkhouse areas were recruised and it was found that during the summer following control work the beetles had killed about 75 percent as much timber as in 1911. This reduction of only 25 percent indicated that satisfactory results had not been achieved, so the Forest Service reworked the areas during the spring of 1913. This second working of the areas was followed by a fairly satisfactory reduction of the infestation. The amount of timber killed during the season of 1913 was only about 45 percent of that killed in 1912. This amounted to a total reduction during the two seasons following the initial control work of about 70 percent.

It was here that Dr. Hopkins stepped in with his percentage principle of control. He maintained that if from 50 to 75 percent of the infestation is removed by artificial control work, natural factors of control then take over and hold the beetles to a normal or endemic condition. He recommended against any further control work on the Craggy and Barkhouse areas, so the Forest Service did not carry on work during the spring of 1914.

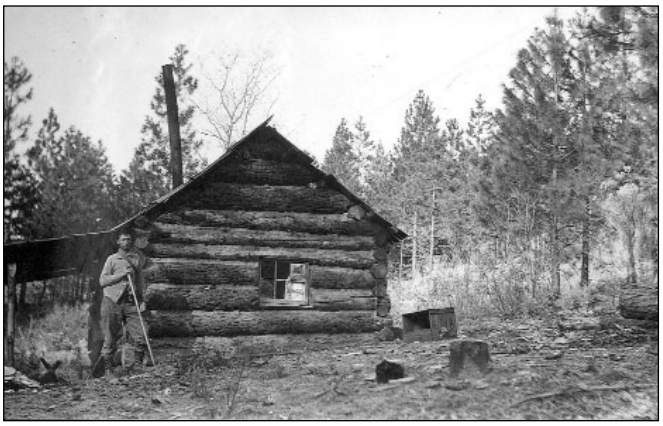
In the meantime Ralph Hopping had been appointed as Forest Examiner to supervise all of the bark beetle control programs of the Forest

J.E. Patterson, PSW

Figure 29—Glendinning in camp at Doggit Creek, California, 1914.

Service in the California district. One of Hopping's first moves was to question the percentage principle of control. He believed that if there was any infestations within an area it should be treated. He examined the Craggy and Barkhouse areas during the spring of 1914 and found infested trees fairly plentiful. He predicted that this untreated infestation would increase and openly criticized the Bureau of Entomology for its short-sighted policy of percentage control. Much of this criticism got into official correspondence channels which reached Dr. Hopkins and Chief Forester Graves in Washington. The matter soon developed into the proportion of an inter-bureau controversy.

Mr. Graves decided to see for himself what all this dispute was about and made plans to visit the Craggy and Barkhouse areas in the spring of 1915. In April he made a trip to Yreka and I accompanied him on an inspection of the areas with Hopping, Forest Supervisor Rider and W.E. Glendinning who had then become an Entomological Ranger in the Bureau of Entomology [fig. 29]. What we found was of little comfort to opponents of the percentage principle. The infestation left on the areas in the spring of 1914 had not increased; on the other hand it had declined without benefit of control work to such an extent that there were fewer infested trees to be seen than at any time since 1910. This condition convinced Mr. Graves that the strategy of percentage control was sound and he later issued a statement reviewing the entire controversy and giving the endorsement of the Forest Service to the recommendations of the Bureau of Entomology.



J. M. Miller family

Figure 30—Miller in front of the log cabin he lived in on the Big Humbug Ranger Station, 1911.

As the percentage principle has worked out on many western pine beetle projects since then, a percentage of the total infestation is about all that it is possible to find and treat anyhow. Even with the most careful work from 10 to 25 percent of the infestations is missed, so percentage control is the best that can be hoped for.

Miller's diary resumes in 1912, mostly in regard to his work on the Craggy Mountain Project, out of Yreka, as a new Entomological assistant in the Bureau of Entomology. On March 20, 1912, John and Bessie's son Harold was born in Yreka, but during the summer wife and baby returned to the Brose Ranch at Parlier (Miller, n.d.a). There is no record of what Bessie thought of this transfer to the Bureau, but she would soon learn that fieldwork was just as demanding for a forest entomologist as it was for a forester. For the next 15 years the Millers spent long periods apart and lived in rented homes in many localities in California and Oregon.

Miller's diary shows he spent the first week of the new year cutting down trees in 18 inches of snow and lived in an old log cabin at the Humbug Station with Sullivan and Riggs (fig. 30). Not much change from the rigors of his ranger duties the year before. Miller went to San Francisco on January 21 to attend the District 5 Supervisor's meeting.

January 25, 1912.

Read paper at Supervisor's meeting, very interesting and live [sic] discussion followed paper resulting in the passing of a resolution by the meeting favoring the devotion of more time and money [to forest insect work.]

Hopkins was pretty shrewd hiring a Forest Service Ranger. He became an ex-Forest Service-insider promoting what Dr. Hopkins had long been trying to convince certain Forest Service officials to carry out.

The next day, accompanied by Burke, who also was attending the Supervisor's meeting, they went to the University of California, Berkeley, and "turned over specimens to Coleman." [Probably for identification?] Miller next went to Stanford University and packed up his specimens there and arranged for shipping them to his new station in Yreka. By the end of the month he was in Yreka unpacking and arranging his specimens, preparing expense accounts, etc. Three days later he was back at work in the field. "February 3, Saturday, worked in the morning on section 1 with Sullivan's crew. Morgan Johnson, walked into Yreka in evening with Morgan, left work at 4:50 pm, reached Yreka at 7:05 pm, went around by Hawkensville." I don't know how many miles they covered in 2 hours and 15 minutes after working all day, but I feel sorry for Morgan.[6]

For the first 3 weeks of February, Miller worked with control crews in the field. Burke often accompanied him, and it was pretty obvious from his diary that Entomological Rangers Riggs and Sullivan were making decisions on camp locations and crew assignments, but in cooperation with Rangers Gott, Morgan Johnson, and others. The Klamath National Forest History said this about the proposed control work: "Word was received that insect control work would be *supervised by the Forest Service* [italics added] on National Forest lands. A staff of specialists was to be established in the District office to assist the forest in surveys and control programs. The Bureau of Entomology would be called on to furnish *only the scientific information needed*" [italics added] (Davies and Frank 1992: 53-54). District 5 Forester Coert DuBois was officially warning Hopkins not to exceed his authority, but in the field there was evidently very good cooperation with a mixing of responsibilities and supervision. The field men realized the job at hand was to kill bark beetles and went at it as a team—forest rangers, entomological rangers, and laborers. For instance, Miller did everything from marking and falling trees to acting as camp cook.

Burke sent Miller on a survey and insect collecting trip to the Weaverville-Hayfork area for the next two weeks. Miller's diary entry for Saturday March 2 is interesting because we have one of Miller's most often used photographs documented by this entry. "Made trip from Lewiston to Redding [by stage coach] stopping at French Gulch for lunch. Took picture along road where Ruggles boys robbed stage."

The next day Miller was back on the control project. The month of March, amid some nasty weather was spent developing photos, writing reports, making maps of infested areas, summarizing data, preparing insect specimens, and every several days checking the progress of the field crews. On March 20, when his first child was born, Miller was overnight at a bug camp. He evidently received word of the event because he returned to Yreka the next day.

By the first week of April it turned hot, and several of the fires used to kill beetles in infested trees escaped. "Saturday April 6 . . . rode back through Kelly Gulch and saw heavy smoke on ridge above water trough (Lane's Camp) saw Conover and Sam White but took Bert Jackson, O. White, and Musgrove to the fire." Miller's days as a ranger when he was an automatic smoke chaser came in very handy.

The next day, Sunday, April 7:

> Went to rattlesnake den below Dead Cow Spring. A large party of Klamath River people were present. Pried off the rock covering hole and got eleven snakes, 18 altogether according to reports were taken from the hole. Took lunch with the Party at the Beetle Camp. Went back to Whites, did not go up to the fire as planned as the cool weather seemed to make it safe.

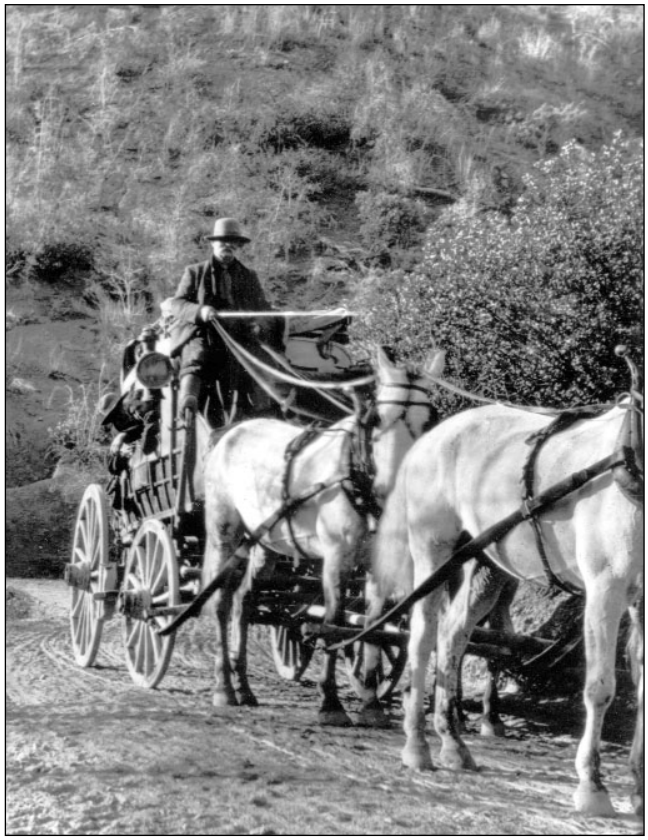
Life was simpler in 1912 when a picnic at a rattlesnake den was considered an exciting Sunday outing (figs. 31 and 32).

The remainder of April turned cool and rainy with occasional snowfall making field work and camp life very disagreeable. However, there were only a few more weeks available for control work. By late April or May beetles

[6] John Miller was a tall, long-legged individual who was renowned for his walking ability by his coworkers even into his late years. There will be more on his prowess over terra firma when Miller's work in Yosemite National Park is covered.

would be emerging from the bark of pine trees, and further felling and burning infested trees would be finished for the season. So there was a rush to hire more men and push the work to conclusion. During this period, Burke and Miller were working together in the field constantly checking the status of control work and moving camps as needed. By April 23 they began closing camps and sending crews in to Yreka. For the next week Miller worked on reports of the Humbug control projects. But a few scattered trees were still being found, felled, and treated up to May 21. The weather had been cool and stormy in May, so the emergence of the new beetle brood was evidently delayed. The next week Miller worked up data on the control project and prepared reports for Hopkins and others. It seemed that since Miller had been involved with the project since 1910, Burke deferred to him to prepare reports and data. Or since Burke was in charge maybe he just gave Miller the dirty work, because Burke authored the final report for 1912 (Burke 1912).

The draft copy of this report in my possession has 12 pages of single-spaced tables covering data on trees treated, costs, crew organization, and other data. There is only a half page of narrative. The report authored by Burke contains page after page of data and says the report was prepared by J.J. Sullivan and H.E. Burke. There is something unsettling about the report. Both Burke and Miller were excellent



J.M. Miller, PSW

Stagecoach at the site of the 1892 holdup by the Ruggles Brothers. Miller was riding from Weaverville to Redding, California, when he evidently convinced the driver to stop so he could photograph the scene, March 2, 1912. The photo has been widely used and is an example of Miller's interest in photography beyond just entomology subjects.

J.M. Miller family

Figure 31—Bug control crew at Little Humbug Creek and the rattlesnakes they killed, 1912.

Figure 32—Picnic at beetle camp (after the snake killing), 1912.

writers and other reports contained very clear explanations and summaries of their projects. This report was presented just 1 month after the conclusion of control work, had practically no narrative, and Burke lists Sullivan, an Entomological Ranger, as author before Burke. It is almost as if Burke and Miller did not want to be strongly associated with it. Did Hopkins or the Forest Service put pressure on Burke and Miller to rush the report out? The final report was prepared by J.R. Hall, Acting Forest Supervisor of the Klamath National Forest (Hall 1913).

The report for the 1913 work gives no reference to Burke, Miller, or other Bureau of Entomology personnel, yet they were there off and on. It contains mostly costs and expense tables and has no reference to the previous year's work. There is no final report by the Bureau of Entomology that I can find. And the report submitted by Burke in 1912 was very uncharacteristic. It was unfinished and unpolished.

Burke packed up Field Station 5 and moved to Placerville, and Miller and several Entomological Rangers went to Ashland to start a new field station. What happened? This was the first large bark beetle control project in California, and based on the reports from other projects of the era, it should have been published.

In early June, Miller was at Sisson [Mt. Shasta City] working on cone insects, but he was still based in Yreka. His entry for June 13, 1912, is noteworthy. "Arranged at garage in Dorris for automobile transportation to Hayworth ranch . . . arrived at ranch at 10 am went up to the Secret Springs ranch with Richardson and Riggs. Cruised out 100 acres in the afternoon. Stayed at camp." Automobiles had probably been used at an earlier date by Burke and Miller, but this is the first reference of such use in Miller's diaries. In one day they traveled for several miles by auto then still had time to cruise 100 acres.

The month of July was spent traveling as far south as Sisson and north into southern Oregon collecting cones and seed insects. Part of these collections were sent to Hopkins. At various times, Burke, Riggs, and Coffman traveled with him. By August 1 Miller was back at Yreka. Significantly, he is calling it a "temporary field station."

The first two weeks of August, Miller worked on cone insects at Yreka. His August 14 entry "climbed Mt. Shasta and returned to Sisson." Quite a hike in one day. Climbers today drive halfway up the mountain and camp overnight. On August 16 he was at the Pilgrim Creek nursery looking for cone insects. Most of the remainder of August, Miller was based in Yreka, but the last week he cruised timber for the McCloud River Lumber Company on insect survey. This was the first such work with McCloud River Lumber Company for Miller, and it started a cooperative relationship

between them and forest entomologists that lasted almost six decades. I did some insect survey work with their foresters in the 1950s.

Early September found Miller finishing up reports. There is no mention of Burke or others being there on September 11. "Worked on reports at Yreka and packed up for leaving." September 12 "cleaned up office and locked up everything for leaving left key at McKendricks. Stored personal belongings at office, left on 2:45 train for Willow's." The beginning of the end for Field Station Number 5 was at hand. In September, Miller was working on what is now the Mendocino National Forest, and using a new mode of transportation. September 14, "Left Elk Creek early in the morning and hired a team and driver to take me out and catch the Alder Springs team— *rode on a load of hay* [italics added] out to Alder Springs met Rube Hartman and Mr. Godwin." On Thursday, September 19, "rode out to Kneecap with Rube Hartman. Returned to Alder Springs about 4:00 pm. Shaved and talked over control work with Godwin." I can see Miller after a week camping in the field all lathered up, razor in hand, discussing the finer points of killing bark beetles.

Miller then went to San Francisco where he met with Dr. Meinecke at District 5 headquarters and then with Burke at Palo Alto. Here he received instructions for examinations of forests in the Southern Sierra. As he traveled south from Palo Alto there is this entry: "September 27, hot, left on Sanger-Hume stage at 7:00 am had a most delightful trip and finally arrived at Dunlap at 7:00 pm. Team gave out on the road." The next day was not much better. As he proceeded by stage to Millwood in Grant Park [National Park] he "walked most of the way." He collected cones for insects for several days at Huckleberry Meadow then proceeded to Reedley where he arrived on October 3. After a brief reunion with his family, he was on his way to El Portal on October 6.

Miller rode the stage, costing $2.50, from El Portal to Camp Curry in Yosemite National Park and interviewed Major Forsythe in the afternoon of October 7.[7] He also wired Burke of his plans and received advice to proceed with his collecting cones in Yosemite. On Tuesday October 8 " . . . saw Ranger Gaylor in the evening and discussed plans for trip to Lake Tenaya." He rented a horse and rode to Tenaya Lake and Tuolumne Meadows where he spent several days collecting cones. On the 14th to 16th of October, he attended a meeting of the Yosemite Park Conference (which may be why he was sent there in the first place). By October 17 he was back in Reedley. For the next several days he worked over his collection of white and red fir cones at Reedley. On October 22 he was back in his old stomping grounds, North Fork. He met Ranger Mainwaring and collected seed from ponderosa and sugar pines for insects. Then it was back to Reedley where he sacked up his cones and shipped them and himself to San Francisco. He met several days at the District 5 office with Dr. Meinecke and at Palo Alto with Burke. He purchased some photo supplies at Stanford University and was back in Yreka on November 1st.

It is pretty obvious that by this time Miller was making a statewide survey and collection of cone and seed insects. A project of this magnitude had to have the blessing of Dr. Hopkins and his keen interest. This was the start of some entomological research that occupied Miller for the next several years and resulted in one of his first publications (Miller 1914). This practical little manual was the first published by the Division of Forest Insect Investigations devoted entirely to cone and seed insects. It contained some excellent photography by Miller. The unusual part of the publication was that the insects discussed had not been identified by taxonomists. It would take a decade or more for the naming of the insects to catch up with Miller's collecting and research.

One of Hopkins' strong points was to encourage his entomologists to publish as quickly as possible. He seemed to believe that entomology could be of no use to the practitioner or used to solve problems unless information was available as a publication. He certainly led by example given his numerous and timely publications.

Miller stayed in Yreka until November 8, packing the office materials, photos, insect specimens, and personal household items. He met Burke at Montague that evening. After a layover in Sisson to confer with the McCloud River

[7] Major Forsythe 2nd U.S. Cavalry was the acting Superintendent of Yosemite National Park. At that time, the U.S. Army had responsibility for protecting and administrating the national parks (Hampton 1971).

Lumber Company, he was on his way to Sacramento and Placerville. He spent the next several days in Placerville looking for a house to rent for his family. It looked like Miller was going to join Burke at the field station at Placerville. On November 19, Burke arrived in Placerville, but Miller spent the rest of the day packing up. Was there going to be a change of plans? Miller went off to San Francisco and Reedley on annual leave. During his annual leave, he visited Palo Alto and San Francisco for several days, then arrived back on duty at Placerville on December 7. He again started hunting for a house for his family. He worked in the "Bug Office" as he called it, developing photos, arranging files, and generally setting up a field station. He moved from one rented house to another. On Christmas Eve he went to "Mosquito Bridge on the American River to collect Christmas tree." New Year's Eve, 1912, found him in the office at Placerville writing a letter to A.D. Hopkins. Was there going to be another change for Miller and his family?

CHAPTER 9: 1913—Western Forest Entomology Is Reorganized

The Division of Forest Insect Investigations was beginning to be noticed as a valuable source of knowledge by Private Timber Owners and foresters in the Forest Service and soon-to-be Park Service. Much of this respect was due to Hopkins promoting from Washington, D.C., and the caliber of entomologists he was assigning to the field offices, but it helped to have some serious forest insect outbreaks in many localities in the West. It was becoming obvious that the half a dozen or so entomological assistants and rangers could not give technical advice in the Rocky Mountains, Sierra Nevada, Cascades, and points in between from their small field stations in Montana, Oregon, and California. There was also some dissent from Hopkins' field entomologists about his meddling and second-guessing their work on the large bark beetle control project on the Klamath National Forest. Also, the Forest Service was taking its insect control responsibilities more seriously, and some of their technical men, like Ralph Hopping, were even challenging some of Hopkins' pet theories on bark beetle ecology.

Hopkins was not about to let his empire falter; he was the proactive type. He therefore called all his field entomologists to Washington, D.C., February 26-March 1, 1913, for a conference on reorganizing the Western field stations. This group included, besides Hopkins, Burke, Miller, Edmonston, Evenden, and Brunner from the West and three of the eastern entomologists. Burke describes the reorganization with few words in his memoirs, but this was a major policy and operating procedure meeting (Anonymous 1913).

The Station at Placerville, California

The station was continued at Yreka for only a little more than one year. A central location in the California pine region seemed more desirable and accordingly Forest Insect Station 5 was moved from Yreka to Placerville during the first part of November 1912.

In February 1913 all of the technical men in Forest Insect Investigation were called to Washington for a conference on plans and organization. I spent February 27 to March 5 at the conference and then stayed in Washington until May 29 to do some special work on the flatheads, particularly *Agrilus*, one species of which was connected with the dying of many chestnut trees.

H.E. Burke family

Figure 33—Burke or Sullivan with team and wagon in Placerville, California, 1913.

At the conference it was decided to place the western forest insect work under three stations, the Northern Rocky Mountain, the Southern Rocky Mountain and the Pacific Slope with headquarters at Ashland, Oregon. I was placed in charge of the Pacific Slope but remained at Placerville to complete the investigations already started [fig. 33]. A sub-station on forest tree seed insects was to be started at Ashland with Miller in charge (Wickman 1987).[1]

His memoirs also included a page on the Southern Rocky Mountain Station and the personnel assigned to it (fig. 34).

What Burke failed to mention was that Hopkins was covering much more than Station reorganizations at this meeting. There were 43 typed pages in the conference report, and subjects discussed included how to collect and ship insects to Washington, D.C., what kind of alcohol to use for preserving specimens, who would be specialists in various types of forest insects (Burke—Buprestids, Miller—cone and seed insects), correspondence policy, publications, lines of authority, and on and on.

Hopkins also decided that the field stations would no longer be numbered; they would have names, e.g., "Pacific Slope" for Burke and Miller's assignment. Hopkins was also becoming increasingly interested in doing his bioclimatic

[1] Actually the research at Ashland was much broader than cone and seed insects. Some of the earliest and most intensive studies on western pine beetle population dynamics and epidemiology were begun there also.

Figure 34—Southern Rocky Mountain Station, Colorado Springs, Colorado, 1913-1919 (left to right) W.D. Edmonston, in charge; A.B. Champlain, and B.T. Harvey. From Baker, Oregon, Edmonston went to Klamath Falls, then to Ashland, and in the fall of 1913 to Colorado Springs, Colorado. With him went Hofer and Harvey. Champlain was later added to the staff to carry on studies of the biology of forest insects and devoted considerable time to the parasites and predators of bark beetles. J.H. Pollock was appointed as Entomological Ranger in 1914 and specialized in studies of forest Adelgids. This station was closed in 1919 when Edmonston and Hofer moved to Tucson, Arizona, and Pollock was transferred to the Ashland station. Harvey and Champlain in the meantime had resigned.

research on a national basis. He instructed all of the men in attendance how to set up his phenology research stations and take measurements, with data to be sent to him at once.

He even suggested, that as railroad travel was the main source of transportation at the time, the entomologists should observe forest conditions during train travel and take notes on their observations. What he perhaps did not realize was that the western entomologists tried to travel by night trains in Pullman cars so they could go to work in the morning at their destinations. Miller's diary has many references to travel by Pullman car.

Hopkins also suggested that an organization known as "The Society for Advancement of Forest Entomology in America" be formed by those in attendance on the last day of the meeting on March 1. The initiation fee was to be 50 cents and the annual dues 50 cents. "The following officers were elected: President, A.D. Hopkins; Vice President, H.E. Burke; Recording Secretary, T.E. Snyder; Corresponding Secretary-Treasurer, F.C. Craighead." The annual meeting procedures and subjects were discussed, but there is no further mention of the society in future years. It must have died aborning, probably because of travel difficulties at the time. It did demonstrate that Hopkins and his entomologists saw the need for a professional society of their peers.

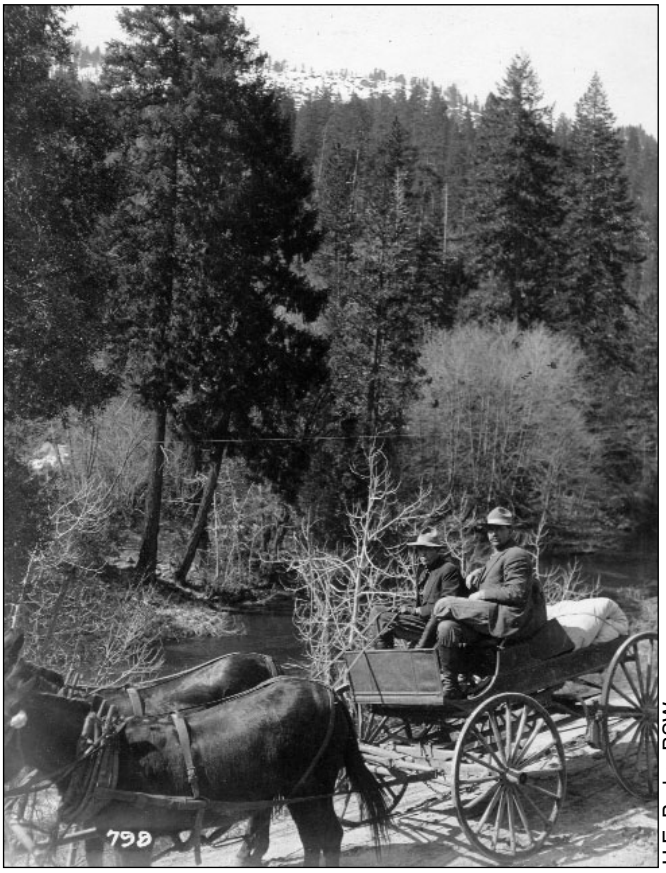
Strangely, Miller's diaries and letters do not go into any detail about his new assignment as leader of the Ashland field station. He assumed that his family would shortly join him in Placerville. He had rented a house and had all of his insect collection, field notes, and photography equipment there. He had spent January setting up his personal and work facilities in Placerville, when his diary, on January 18, states, "Received letter from Dr. Hopkins relating to trip to Washington." Did the letter forewarn him about his new assignment? It is difficult to tell from what Burke and Miller have written. His diary, in a laconic manner, just records his preparation of work on a manuscript on cone and seed insects and much photographic work to do until it was time to leave for Washington, D.C. (which took 5 days of train travel). His diary is not illuminating about his meeting with Hopkins "attended conference of fieldmen at Dr. Hopkins' office in the Star Building." That was the usual diary entry until March 4, when he witnessed the inauguration of President Wilson. He returned to Placerville in mid March.

During March, April, and May, Miller was bouncing around between Placerville, Yreka, and San Francisco, shipping his supplies to Ashland; he finally arrived at his new station on April 27. Then he left for San Francisco and helped Burke with some bark beetle work in Placerville in May. He was about to embark on some historic forest insect work in Yosemite National Park, but first let us return to Burke's memoirs on the Placerville Station.

> Before I returned to Placerville on June 3, 1913, due to the preliminary work done in 1912, control work against the western pine beetle started

H.E. Burke, PSW

Figure 35—The Davis cabin on the tract of timber owned by the C.A. Smith Lumber Company near Pino Grande. This was the field headquarters for the protection work of the company and was used as the base camp for the 1913 forest insect survey. Mr. Davis, Representative of the company and Entomological Ranger J.J. Sullivan made a preliminary reconnaissance in May 1913.



H.E. Burke, PSW

Figure 36—J.J. Sullivan and P.D. Sergent on a trip up the American River Canyon near Kyburz in April 1913.

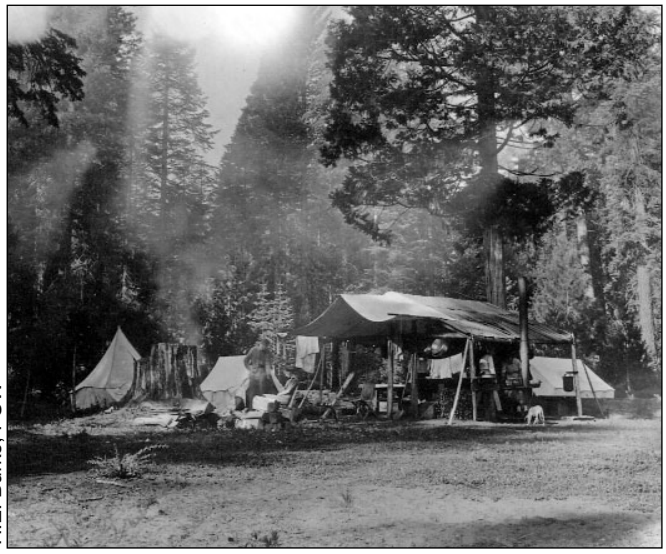
near Bray, Siskiyou County, and in the Yosemite. The first, the Antelope Creek Project, was carried on by the McCloud River Lumber Company with the assistance of J.D. Riggs. It so convinced the Company of the value of bark beetle control that they made it a regular part of their operations for a number of years. This probably was the first time that any private timber company had adopted such a plan. The work in the Yosemite under the direction of J.M. Miller was the first forest insect control work conducted in any of the national parks. It also was carried on for several years.

During July and August I assisted the C.A. Smith Company to cruise part of its timber near Pino Grande to determine the insect loss in a mature stand of mixed yellow pine and sugar pine. This stand between the Middle Fork and the South Fork of the American River was considered by timbermen to be one of the finest stands of timber in California.

A careful cruise of the area indicated that while there had been no insect epidemic for a number of years there was a constant annual loss of the best trees. On 1,280 acres cruised in one solid block, there were 14 killed sugar pine (77,735 board feet) and 16 killed yellow pine (55,230 board feet) all killed in 1913 and a total of 290 killed sugar pine (1,572,745 board feet) and 121 killed yellow pine (327,205 board feet). The cream of the timber was being killed. Ninety-one of the dead sugar pine were over 5 feet in diameter and it was these large trees with the clear lumber that made the lumbering profitable. This probably was the first time that a lumber company had made such a detailed study to determine the actual loss caused by tree-killing insects [figs. 35 and 36].

Field Trips Out of the Placerville Station, 1913

Besides carrying on this project (Onion Creek project) I made a number of observations on the biology of various forest insects. Among these was the biology of the *Oryssus*, a hymenopterous insect of which little was known, but which when the biology was finally determined, changed the major classification of the



H.E. Burke, PSW

Figure 37—Burke family summer camp at Philips east of Placerville, 1913.

order Hymenoptera. Another project started was a study of the oak twig girdler, a pest which caused considerable damage to live oak in California. This study probably aroused my interest in the investigations of shade tree insects which I carried on for a number of years.

I spent the field seasons of 1914 and 1915 and part of 1916 at the Pyramid Ranger Station about 40 miles east of Placerville on the Tahoe road. Close by were sugar pine, yellow pine, Jeffrey Pine, lodgepole pine, white fir, red fir, Douglas-fir, mountain hemlock, incense cedar and Sierra Juniper [fig. 37].

Many observations were made on the bark beetles and on flathead borers. The flathead borers of the genus *Trackykele* were given special attention. Three species of this little known genus were found and carefully studied. One caused considerable damage to the wood of incense cedar, one to the wood of juniper sought for pencils and the third bored in the wood of the tops of white and red fir.

Considerable attention was also given to the project "the relation of Mistletoe on living trees to attacks by tree-killing insects," which had been assigned to me. It was found that 64 percent of virgin growth yellow pine and 73 percent of virgin growth Jeffrey pine in typical areas near Pyramid were mistletoe infected. The conclusions drawn from the study were (a) trees infected by mistletoe are not more subject to attack by *Dendroctonus* beetles than trees not so infected, in fact it looked as though badly infected trees were less liable to attack than trees free of infection; (b) trees weakened by mistletoe do not contribute to the increase of *Dendroctonus* beetles.

Before and after the regular field seasons studies were made of the insects living in the trees and shrubs in the vicinity of Placerville. Special attention was given to the flat headed borers of the genus *Agrilus* and to the bark-mining midge which causes the birdseye pine. Many parasites and other insects were reared and sent to the specialists in Washington. Several trips were made to Palo Alto to study the oak twig girdler.

The Antelope Creek project and the Yosemite Control project continued more or less under the direction of the Placerville station, but due to the poor lumber market, no new private lumber company under took any control work. The C.A. Smith Company which had been such a good cooperator finally failed because of too much timber which they were not able to carry.

It is hard to determine Burke's state of mind during this period. His memoirs give no clue about his reluctance to be with the men under his supervision at the Ashland station. And, with Hopkins putting Miller in charge there, Hopkins was apparently preparing Miller for more important positions. Some of this will come to light later in the story.

A.D. Hopkins notched another first in his bug-seeking endeavors in Western forests, but this time he was not the first to collect or study the reported needle miner outbreak. However, he did discover mountain pine beetle killing giant sugar pine in the Wawona area and encouraged park personnel to begin the first bark beetle control operations in any national park.

Miller's trip to Yosemite National Park was perhaps one of his most important early assignments, and several "firsts" in forest entomology resulted. The history of entomology in the park is interwoven throughout this story because both Burke and Miller had a long-term association with Yosemite (fig. 38), both officially and unofficially during visits with their families.

J.M. Miller family

Figure 38—Hand-built Tioga stage road along Tenaya Lake, Yosemite National Park, 1913.

Pioneer forest entomologist, John Patterson summarized the story of forest insect problems in Yosemite (Patterson 1921). He stated (from Hopkins 1912):

> In 1903 it was reported to the Bureau of Entomology through the Secretary of the Interior that large areas of lodgepole pine in the Yosemite Park were affected by a leaf-mining moth. In May 1904, Dr. A.D. Hopkins visited the Yosemite Park, planning to investigate the conditions reported, but was unable to reach the lodgepole pine area, as all trails leading into the region were still closed by heavy snow.

Next on the scene was H.E. Burke. On July 10, 1906, he started his stagecoach ride to Yosemite probably not knowing that a bandit had held up two stages just 3 days before, on the same route. It must have been an exciting time to be a forest entomologist. Eventually, Burke made it to the High Sierra country in the Tenaya Basin and Tuolumne Meadows and could not find the needle miner, but did find many lodgepole pine being killed by the mountain pine beetle.

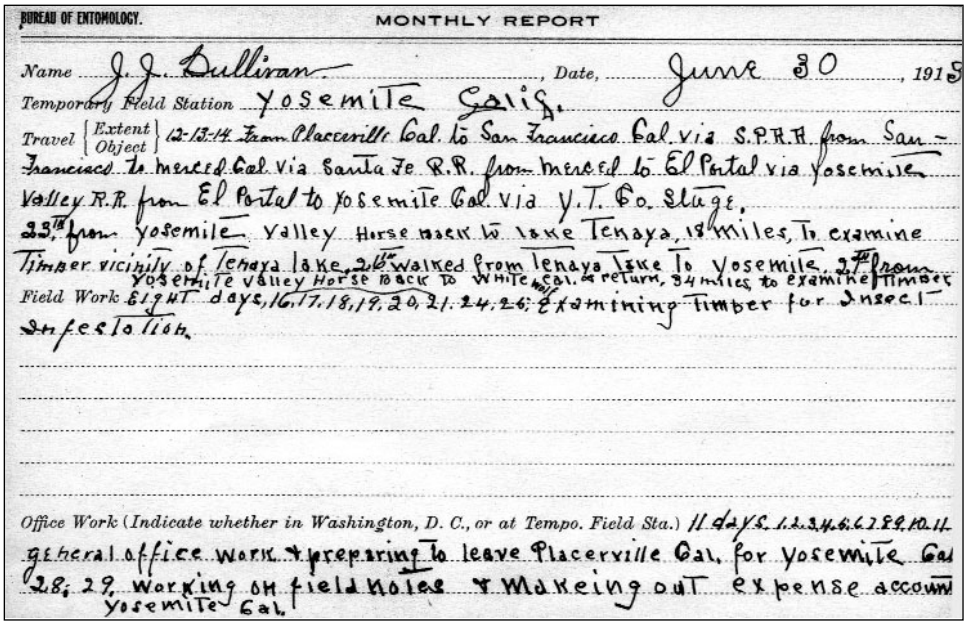
During the next four years, there were reports of the needle miner in Yosemite made by Professor Comstock in 1907 and by forest pathologists E.P. Meinecke in 1911 who noted a heavy flight of moths in the Tenaya Basin. Forest entomologists were unable to visit Yosemite at that time because of large bark beetle control operations in northeast Oregon and northern California. Finally, in October 1912, J.M. Miller, in his first year on the job with the Bureau of Entomology, visited Yosemite's high-elevation country. Miller found that the bark beetle problems in Tenaya Basin and Tuolumne Meadows had intensified, and he found defoliation caused by the needle miner, but no adult moths. The lodgepole needle miner has a 2-year life cycle, and adults fly and lay eggs in odd-numbered years. So the collection of flying moths was hit or miss until more definitive studies of the insects' life history could be made. Miller, however, could easily see that this was a large and important forest insect outbreak and might also be related to the expanding mortality of lodgepole pine by mountain pine beetle. In 1913 the moths were finally collected by Miller and sent to taxonomic specialist August Bursck. He described them as a new species *Recurvaria* [= coleotechnites] *milleri* in 1914.

Miller used Yosemite Valley as his headquarters from June 16 until August 22, 1913, although he was mostly in the high country. When he was there, he used the semi-luxurious accommodations of a tent at Camp Curry and an office/laboratory in a park warehouse.

Miller was constantly riding horses or mules or walking to and from the High Country at Tenaya Lake and Tuolumne Meadows. He was not only studying the needle miner, but he was supervising crews of laborers falling and burning lodgepole pine infested with mountain pine beetle. He had the assistance of Entomological Ranger J.J. Sullivan in this work. As a trained timber cruiser, Sullivan located infested trees for the crew. Sullivan's monthly travel report for June 30, 1913 (fig. 39), shows the hardships and variety of travel in that era. His conveyances included railroads, stagecoach, horses, and shank's mare.

On July 29, Miller's diary notes, "Left Tenaya control camp at 9 am and rode to Tuolumne Meadows. Arrived at 1 pm, began to rain about 2:30 pm and had heavy thunderstorm with rain and hail. Went to Soda Springs outpost and camped directly across the river from Soldiers [U.S. 4th Cavalry (Hampton 1971)] near the Sierra Club Cabin." The Sierra Club Cabin made of local granite stone is still used.

On August 5, Miller left on an extended horse trip with two park employees visiting and noting "considerable dead timber in Virginia Canyon, Benson Lake, and at Matterhorn Canyon. Looked over some of the immense stands of



BUREAU OF ENTOMOLOGY. MONTHLY REPORT

Name J. J. Sullivan, Date, June 30, 1913

Temporary Field Station Yosemite Calif.

Travel { Extent / Object } 12-13-14 from Placerville Cal. to San Francisco Cal. via S.P.R.R. from San Francisco to Merced Cal. via Santa Fe R.R. from Merced to El Portal via Yosemite Valley R.R. from El Portal to Yosemite Cal. via Y.T. Co. Stage, 23rd from Yosemite Valley Horse back to Lake Tenaya, 18 miles, To examine Timber vicinity of Tenaya lake, 26th walked from Tenaya lake to Yosemite, 27th from Yosemite Valley Horse back to White Cal. & return, 34 miles, to examine timber

Field Work EIGHT days, 16, 17, 18, 19, 20, 21, 24, 26; Examining timber for Insect Infestation.

Office Work (Indicate whether in Washington, D. C., or at Tempo. Field Sta.) 11 days 1, 2, 3, 4, 6, 7, 8, 9, 10, 11 general office work & preparing to leave Placerville Cal. for Yosemite Cal 28, 29, working on field notes & Makeing out expense account Yosemite Cal.

Figure 39—Monthly travel report of J.J. Sullivan for June 1913, Yosemite National Park. He traveled by railroad, stagecoach, and horseback and walked many miles.

bark-beetle-killed timber there and also in Verrick Canyon and Jack Main Canyon." Miller made the first map of this combined infestation of lodgepole needleminer and mountain pine beetle that covered over 30,000 acres of the High Sierra portion of the park.[2]

August 22 Miller left Yosemite for the summer and proceeded to Placerville to pick up his personal effects and supplies, arriving at Ashland on August 30. Thus began a new phase of his life as leader of the Bureau of Entomology Forest Insect Station at Ashland, Oregon. In September he not only had to rent a building for the lab, but also a personal dwelling, set up the laboratory, meet with his staff of Patterson, Sergent, Glendinning, and Wagner. During all of this activity he received word that his father was gravely ill. He arrived in Reedley before his father died on September 17. By September 23 he was back at Ashland with his family, studying cone and seed insects in the nearby forests and becoming settled in the community.

An illustration of the breadth and modes of travel in 1913 is Miller's insect-collecting trip to Pacific Grove, California, in November. On that trip he rented a bicycle, a motorcycle (which broke down), and an automobile. That year he had already used train, stagecoach, horse, mule, and walking in Yosemite. The newest form of transportation was still in the development stage by the Wright Brothers or he probably would have tried it as well.

In Ashland, Miller finally had the most settled family life of his career thus far and became more oriented toward scientific inquiry versus continual travel to survey, collect, and supervise insect-control projects.

[2] I revisited all of these areas using the same mode of transportation in the summer of 1953 to map a new needleminer outbreak.

CHAPTER 10: The Early Ashland Years, 1914-1916

By 1914 Burke was devoting most of his time to forest insect studies in the Placerville area. It was essentially a one-man station with intermittent help from entomological rangers from the Ashland station. Miller and his family were settling in at Ashland, with Miller in charge of that station. Most of his personal research involved cone and seed insects.

It is odd that neither of them, Burke in his memoirs, nor Miller in his diaries, mentioned an important bark beetle outbreak developing in Klamath and Lake Counties to the East of Ashland. Jackson F. Kimball, secretary of the Klamath-Lake Counties Fire Association, but actually employed by Weyerhaeuser Company, was trying to instigate a cooperative bark beetle control project with private interests, the Forest Service, and the Indian Service (now Bureau of Indian Affairs). In 1911 he got Edmonston, a Bureau of Entomology entomologist, involved in a very unsatisfactory project near Jenny Creek just east of Ashland. Kimball promised much help from his fire association, but delivered little, and what he did do with his men he tended to carry out on his own unscientific terms, greatly irritating Edmonston who bluntly informed Hopkins of the situation.[1]

By 1913, there was a very large mountain pine beetle infestation in lodgepole pine on the Paulina National Forest, just north of the private lands and the Klamath Indian reservation. Kimball and others were convinced the mountain pine beetles emerging from these infested trees would attack and kill the more valuable yellow pine (ponderosa pine) stands and that the beetles should be controlled at all costs. Kimball convinced the Forest Service that the cheapest way to do this would be to wholesale burn the dead and dying lodgepole pine forests. When Hopkins heard of this plan, he was very opposed (see footnote 1) for two reasons: first, his host selection principle stated that mountain pine beetles would not shift their host preference from lodgepole pine to ponderosa pine; and second, he feared that burning a forest on a scale of 30,000 acres or more would destroy great numbers of natural enemies of mountain pine beetles in the infested trees. This could cause more problems in the long run by reducing the controlling effects of natural enemies. This controversy is worth recording here because it involved a challenge to Hopkins' host selection principle, it resulted in a change in future insect control policy as it related to the Bureau of Entomology, and it sheds some light on Burke's reluctance to pursue research related to bark beetle control.

Burke's memoirs and Miller's diaries are not a primary source of information; almost 100 pages of official correspondence tell the story very neatly. At that time, Hopkins was personally in charge of all Bureau of Entomology participation in control operations from his Washington, D.C., headquarters. In earlier chapters, Hopkins' fervor for controlling bark beetles was noted, especially relating to the Northeastern Oregon Project (chapter 4) and the Craggy Mt. Project (chapter 8). Hopkins' policy for the field men was to be responsive to requests from the Forest Service, Park Service, and private timber interests for entomological advice regarding possible control projects. Hopkins asked his men to encourage a large control project if biologically warranted. He probably believed this approach would result in good publicity for his organization, thus larger appropriations and ultimately a larger more prestigious organization. He was probably guided in this somewhat by observing,

Tidbits of information printed in the front of Miller's personal journal for 1914

* Woodrow Wilson was President of the United States.
* War was breaking out in Europe.
* Most countries were on the gold standard, except China, where it was silver.
* The Franc was worth 19.3 cents on the dollar.
* The Pound Sterling was worth $1.86.
* First-class parcel post was 2 cents per ounce.
* The population of Portland, Oregon, from the 1910 census, was 207,214, and San Francisco had a population of 416,912.
* The first aid for being struck by lightning was to dash cold water over the person struck.

[1] Correspondence Edmonston to Hopkins, Hopkins to Glendinning, Glendinning to Hopkins, Kimball to Hopkins, Hopkins to Kimball, in my possession.

through his association with Henry Graves, the Chief, how the U.S. Forest Service was growing.

In the fall of 1913, Hopkins ordered Entomological Ranger W.E. Glendinning, to make a reconnaissance survey of the infested area covering several hundred thousand acres, Glendinning found a serious outbreak of mountain pine beetle in pure lodgepole pine stands on Forest Service lands and scattered western pine beetle (WPB)-infested ponderosa pine on the private and Indian reservation lands. Hopkins seemed determined to run the show, and sent little correspondence to Burke in Placerville over what was transpiring. The voluminous official letter-writing was truly amazing. There was correspondence from Glendinning at Parker Station to Kimball in Klamath Falls and to Hopkins in Washington, D.C., Kimball to Glendinning and Hopkins, he in turn replying to both. Then the Indian Service became involved, so there were letters from the Klamath Falls Reservation to Department of the Interior, Washington, D.C., offices. And the Forest Service Chief's office was writing to Hopkins and others. Eventually, of course, the correspondence went up the agency ladders to the Secretary of Agriculture (Forest Service and Bureau of Entomology) and the Secretary of the Interior (Indian Service). Next, Oregon State Forester Elliot also became involved. Chief Graves pledged up to $5,000 to the project (because the most serious outbreak was mostly on the Paulina National Forest at this point) if the private interests would pledge an equal amount to treat WPB-killed ponderosa pine on their lands.

At this point, Hopkins, in October 1913, finally requested Burke, who was in charge of both Ashland and Placerville Stations, to go see the situation in the field. No bona fide entomologist had actually visited the area. For some strange reason, even though he was in overall charge of the Oregon area and Hopkins was his supervisor, he declined to go. He did, however, write a strong letter to Kimball telling him the Forest Service pledged $5,000 and was ready to start fall control operations. He asked when Kimball's organization could come up with a like amount and be ready to start the project. Burke requested an immediate reply. Now Kimball started stalling. He wanted to pursue his pet project of burning down the infested lodgepole pine forest, claiming he was certain the mountain pine beetle populations would soon move to the adjacent ponderosa pine stands. With all of the delay, several large snowstorms effectively closed the outbreak area for the winter, and no control crews were sent out that fall.

Winter did not cool the fervor of the letter writers however; and Kimball started some sharp correspondence with Hopkins telling him he did not believe in Hopkins' host selection principle and he was certain the beetles had already migrated from lodgepole pine to the ponderosa pine stands, for he had seen it himself. That did it! Hopkins shot off a reply to Kimball that Hopkins was, after all, in a much better position to understand the habits of bark beetles because he had studied them and published his findings. An excerpt from this letter of January 22, 1914, follows:

> I can readily understand how the general observer would conclude that the wide-spread infestation in the lodgepole pine was a great menace to the yellow pine, but don't you think that the opinion of one [namely Hopkins] who has a comprehensive knowledge of the insects involved, with extensive experience in many similar cases, is more likely to be correct than that of others who are not so informed?

The next day, January 23, 1914, a very fierce snowstorm hit the area where Glendinning was waiting for men to arrive and set up a control camp. Glendinning wrote to Burke: "the snow is four feet on the level and from five to seven feet on the divides and still snowing when I came out. The mail carrier and I broke the trail out [toward Ashland] with ten head of horses." This ended the proposed project for the winter.

By February, Hopkins was finished with trying to cooperate with Kimball and he wrote to Glendinning with copy to Burke stating the new policy for his men in the Bureau of Entomology to adhere to henceforth.

> February 11, 1914,
>
> I have your letter of January 31 and am much interested in the information you convey in regard to the situation there and your experience with Mr. Kimball. I am much pleased with and fully approve your attitude in the matter. I am not surprised–it is the same old story. The more we do to help make a control project a success, the less recognition is

given to the source of the information. For example, Kimball's printed report: he makes no reference to the fact that all he or any of his men know about the insects or methods of controlling them is the result of the expenditure of some thousands of dollars of our limited appropriation in giving him special instructions. Now he probably thinks he knows more about the whole subject than we do and consequently has very little further use for our advice or instructions. This attitude has been so forcibly impressed upon me in this and so many other cases that I have decided to make no further effort in the line of direct educational work except in cases where it is clearly and definitely agreed that our instructions will be followed.

In the copy of my letter to Mr. Burke, to you yesterday, which is approved by the Chief of the Bureau, our future policy is definite. I am sending it to you in order that it may serve as a basis for you to make it clear to any one who wants to know–that we are engaged in research work for the purpose of determining facts which will be of practical value to private owners, state and federal forest officials, in any efforts by them to prevent unnecessary losses from insect depredations; and that, while we will take no part in or assume no responsibility for control work that is not conducted in accordance with general principles and essential details which we recommend, we will continue to give information when it is requested, and will give instructions in the essential details which we recommend, we will continue to give information when it is requested, and will give instructions of a representative of the Branch connected with a field station. It will be understood that men so assigned must render enough assistance to make up for the time and trouble in giving such instructions, and that their salaries and expenses must be provided.

The final results were that Hopkins pulled his technical men off the proposed project, and the Forest Service did not spend the $5,000. Kimball's association crews did some haphazard efforts treating ponderosa pine infested with WPB through the summer of 1914. Treating infested trees in the summer is mostly wasted effort because by the time crews spot faded trees, the beetles have emerged and are attacking new trees, which have green foliage and are very difficult to spot.

While all of the activity in Klamath County was taking place, Miller was establishing his research in Ashland. Other

J.E. Patterson, PSW

Figure 40—The Ashland station, which was maintained from 1913 to 1924, was at first set up as a substation under Placerville. During the period of its existence, the Ashland station occupied various quarters in the town. The Ashland station occupied Ashland Normal School from 1916 to 1918.

than a few letters and two short meetings with Kimball in Ashland, he seemed to play a minor role. His position as leader is unclear as Hopkins was running the show from Washington, D.C. Why Miller was never involved in the Klamath fiasco remains a mystery.

In the summer of 1915, Hopkins assigned Glendinning to work directly for him and examine the area of infested lodgepole pine next to ponderosa pine stands to see if his host selection principle held up. It was a good test given the sharp demarcation of the two tree species and the high populations of mountain pine beetle. Glendinning could find no new mountain-pine-beetle-infested trees in the ponderosa pine, so apparently Hopkins was vindicated. I think Burke, observing all of these maneuverings and the long-range management of control operations by Hopkins from the Washington office, was influenced both about the biological effectiveness of such work and the lack of authority he had as official leader of the Pacific Slope Stations. Subsequent events will show how some of this played out.

Burke's memoirs continue with information on the Ashland station even though he did not work there and, in fact, only visited several times (figs. 40 and 41).

From 1915 to 1919, the Ashland station carried on a series of studies of bark beetle infestations in the Rogue

J.E. Patterson, PSW

Figure 41—Ashland station personnel, April 1915, in front of the first office and laboratory: (left to right) Dr. A.D. Hopkins, Chief of Division of Forest Insect Investigations; W.E. Glendinning, entomological ranger; J.M. Miller, entomological assistant; and entomological rangers J.E. Patterson, J.D. Riggs, P.D. Sergent, and F.P. Keen.

River and Klamath River watersheds, which led to some new proposals regarding control methods. These recommendations were considered in a series of conferences with the Forest Service, which resulted in the initiation of several experimental control projects.

Hopkins influenced the operation of the Ashland station during this period with his personal research. It involved his interest in plant and insect phenology or "Bioclimatics" as he termed it. Hopkins had the staff at Ashland establish a series of "stations" up the mountains to the west and southwest of the city at progressively higher elevations. These stations consisted of several marked trees and, in some cases, a crude spike camp with shelter, bedding, and firewood cached for overnight stays (fig. 42). March 17, 1915, Hopkins visited Ashland and went to the phenology stations with Miller (fig. 43). From January or February to late summer from 1914 to 1918, members of the Ashland Station would visit these phenological stations at 3- or 4-day intervals to measure and record the development of tree buds and needles at the beginning of the growing season. At some stations, bark infested with WPB larvae and pupae was nailed to green trees to simulate normal infested trees that might occur at a particular elevation (figs. 44 and 45). The objective was to determine if the development of a WPB brood was influenced by elevation and, if so, could the phenological events of certain plants help predict the seasonal

J.M. Miller family

Figure 42—J.J. Sullivan, entomological ranger, in winter camp at phenology station near Ashland, 1914.

J.M. Miller, PSW

Figure 43—Entomological Rangers P. Sergent and J.D. Riggs packing supplies to one of Hopkins' phenology stations, ca. 1914.

activities of bark beetles in the same area. Everyone on the staff participated in this time-consuming project, including Miller, although he also collected cones during these forays to expand on his cone and seed insect research. Hopkins had five of the Forest Insect Division Stations in the United States participate in this research with all of the data going directly to him for analysis. The result was a book published in 1938 (Hopkins 1938).

Hopkins' bioclimatic law stated that:

> The law is founded on the determined country-wide average rate of variation in the time at which periodical events occur in the seasonal development and habits of plants and animals at different

J.M. Miller family

Figure 44—Sergent and cage for western pine beetle studies at Ashland, 1916.

J.M. Miller family

Figure 45—F.P. Keen inside cage for western pine beetle studies, 1916.

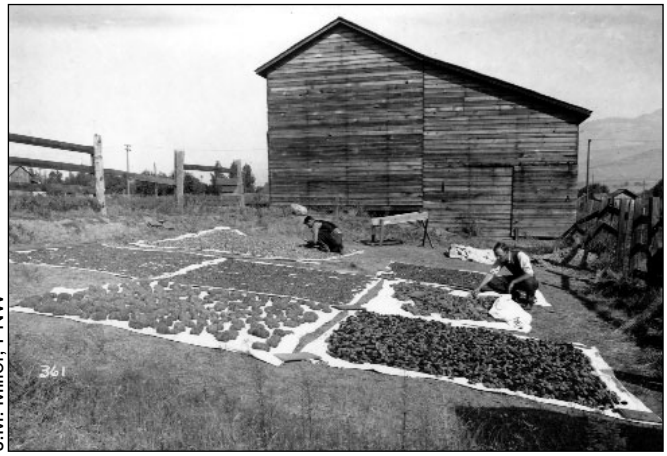
> geographical positions within the range of their distribution. Other things being equal, this variation is at the rate of four days for each degree of latitude, five degrees of longitude and 400 feet of altitude . . . later northward, eastward and upward in the spring and early summer and the reverse in the late summer and during autumn.

The ultimate usefulness of this research relating to bark beetle development was summarized by Miller and Keen (1960) "No fixed relationship of western pine beetle activity to phenological factors has been established, because of the wide climatic and seasonal variations between localities within the range of the beetle's distribution."

Even though the 4 years of research at Ashland may not have produced the desired results, it did have some unintended influence on Miller's future research and career. In the process of dozens of field jaunts to the phenology stations, Miller and his assistants were observing an increasing WPB infestation in the same area. This led to the first detailed epidemiological study of a WPB outbreak called the Rogue River Area bark beetle project, started by Miller in 1914.[2] The phenology research seemed to have an influence on Hopkins' career as well. He became absorbed in bioclimatics and within 5 years resigned as chief of the Forest Insect Division in the Bureau of Entomology and transferred to the Division of Bioclimatics in the Bureau as an entomological scientist where he remained until his retirement. He also seemed to tire of directing the oftentimes frustrating bark beetle control projects best illustrated by the proposed Klamath Project, from his Washington, D.C., office. As Burke relates later in the chapter, 1916 marked the end of Hopkins' hands-on leadership of such projects. He allowed his field men more latitude, to the benefit of all.

Before proceeding with Miller's role in the Rogue River Project, the cone and seed insect research that Hopkins assigned to him in 1913 should be summarized. As noted in the previous chapter, Miller traveled over much of southern Oregon and the Sierra Nevada in California. He did not neglect the coastal tree species. He collected cones and seed insects from Newport on the Oregon coast, south through Crescent City on the northern California coast to Pacific Grove on the Monterey Peninsula. His diaries indicate a particular fondness for Pacific Grove where he visited almost annually for a week or two for a combined collecting project and vacation with his family. His diary entries for these trips are some of the most descriptive in his series. Although his collections and biological notes were meticulous and thorough, and include some of the finest photographs of forest cone and seed insects, little of the work was published, except for his preliminary report of 1914 when he had barely started his research (figs. 46 through 48) (Miller 1914). There were several reasons for this. Miller

[2] Rogue River Area, 1917-1924. A bound compendium of seven typed reports totaling 172 pages of maps, tables, and narrative by Miller, Patterson, and Keen. On file with Wickman.



J.M. Miller, PNW

Figure 46—Cones drying so they could be checked for seed insects, Ashland, Oregon, 1914.

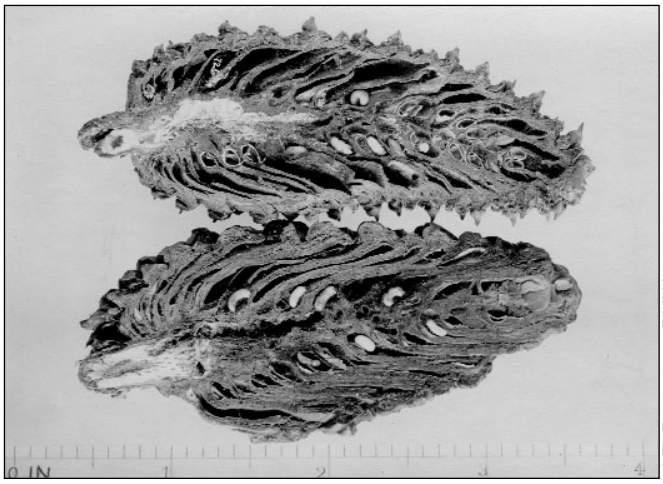
was given administrative responsibility for the Ashland station including supervision of five or six assistants, he was saddled with making Hopkins' phenology measurements, he had responsibility for overseeing bark beetle control projects in Yosemite National Park, and it was becoming increasingly evident that WPB outbreaks were the most important destructive agent in Pacific Slope ponderosa pine forests—even more so than forest fires, as Hopkins had long proclaimed. But perhaps the main reason for ending the cone and seed insect research was that Miller was simply ahead of his time. When F.P. Keen ultimately published most of Miller's studies in 1958, he summarized the history of this research (Keen 1958).[3]

In 1910, Miller, then with the U.S. Forest Service, proposed to Hopkins that a study be made of cone and seed insects. Miller's rationale was that there was a need to assist the Forest Service in seed-collecting work, so collectors could avoid areas where seed was badly infested with insects, sometimes destroying more than 50 percent of the seed. This in part led to Miller's transfer to the Bureau of Entomology in 1911 and ultimately his 5 years of research on the subject. But as Keen points out "the work on cone and seed insects at Ashland was so far ahead of its economic usefulness, that for nearly 40 years very little of the copious material collected at that time was assembled or published." In the 1950s and 1960s, the demand for seed for replanting burns and logged areas revitalized the research.

[3] At least three new species were named for Miller in this bulletin.

J.E. Patterson, PNW

Figure 47—Patterson using camera stand built by J.P. Patterson for taking close-up photographs of cone and seed insects, Ashland, Oregon, 1913.



J.E. Patterson, PNW

Figure 48—Photograph of insect-infested sugar pine cone taken by using Patterson's unique camera stand, 1915.

The development of chemical insecticide applied to forest seed orchards and need for life history information on seed insects finally led to completion of the research begun in 1911.

Possibly the most important research begun by Miller during this period was the previously mentioned Rogue River Project involving the WPB outbreak history in the Rogue, Applegate, and Klamath River basins (Miller and Keen 1960). This first study of WPB epidemiology was started at Ashland in 1914 on a 3,200-acre infestation called the Lambs Mine Unit. (It is not coincidental that the area was also the site of a Hopkins phenology station). The trend and intensity of the beetle infestation killing ponderosa pine was followed for 3 years by timber cruising the area annually. In 1916, Miller suspected that the area was too small to provide an adequate sample of broad infestation trends; therefore, the study was expanded that year to include about 350,000 acres. This area was more than half of the ponderosa pine type in the three adjacent watersheds. This area was biologically and geographically diverse and had a variety of site conditions, so was considered large enough to represent any changes in trends on a landscape scale. Miller, in the first report for this enlarged study, stated that, "one purpose of the study was to determine the character, periods of time involved in, and the causes of the intermittent increase and decrease in the annual amount of infestation" (see footnote 2). This was probably the first landscape-scale biological study in the West, long before such research was in vogue.

Miller summarized the results 1914-17 as follows (see footnote 2):

> *Dendroctonus brevicomis* is by far the most important enemy of the pine and is responsible for 90 percent of the total annual loss. The loss caused by this insect does not remain constant, but is subject to great fluctuations from year to year. In this study the *D. brevicomis* infestation underwent a distinct cycle or epidemic covering a period of 4 years, during which a pronounced increase was followed by a corresponding decrease.
>
> The epidemic which has been studied ran through approximately the same cycle throughout the entire project area of 350,000 acres. The cycle of the infestation within each of the small tributary watersheds which have been termed units was nearly uniform throughout the project area. The high-water mark of the epidemic occurred in 1915 on some units and in 1916 on others. But we do not find a single case of any unit declining to a low point in 1915 or 1916, but in all units studied the epidemic started upward in 1914 and declined in 1917. This indicates that the factors which influence the rise and decline of epidemics are not confined to small local centers or watersheds, but operate throughout great forest areas.

This study was continued under Miller's overall leadership by J.E. Patterson after Miller left Ashland for North Fork, California, until 1925. The study was expanded to other sites as subsequent chapters will detail. It had important implications for future population dynamics research by entomologists and other forest biologists.

Miller also continued his trips to Yosemite National Park to give technical advice on continuing bark beetle control projects there. I do not think he did this because he was enthralled with insect control projects, but because he loved Yosemite high country. In September 1914, he spent 1 week in the Tenaya Lake area, and in 1916 he spent almost 3 weeks in August and September in Tenaya basin and Tuolumne Meadows. Miller encouraged, instructed, and supervised bark beetle control projects throughout the park in sugar pine, ponderosa pine, and lodgepole pine (figs. 49 and 50). He especially promoted control operations against the mountain pine beetle in needle-miner-weakened lodgepole pine. Even though he worked for the Bureau of Entomology, in reality, he became the Yosemite National

J.E. Patterson, PSW

Figure 49—Treating sugar pine for mountain pine beetle, Yosemite National Park, 1918.

Park forest entomologist during this period and set the bark beetle control policies that were carried out for the next four decades.[4]

At the close of Miller's 1916 diary is a very cryptic entry that may be related to the reorganization proposed by Hopkins earlier in the year.

Miller's diary, Sunday, January 31, 1916: "Here endeth the record for the year 1916. Has been fairly successful for yours truly."

In the next chapter Burke will shed light on changes for both men.

[4] The author along with retired Forest Service entomologist George Downing gave technical advice for the last large mountain pine beetle project in Delaney, Dingley, and Conness Creeks in 1955-58.

J.M. Miller, PSW

Figure 50—Lodgepole pine killed by mountain pine beetle following the 1890s lodgepole needleminer outbreak near Tenaya Lake, Yosemite National Park, 1916.

Continued

CHAPTER 11: 1917-1919, Burke and Miller Change Roles as the Division of Forest Insect Investigations Evolves

Why had Miller been so self-satisfied, as evidenced by his diary entry for January 31, 1916? His diaries do not record his inner feelings as a rule, and they never contained criticisms of his colleagues or boasts of his accomplishments. Unfortunately, they also do not record many administrative or management changes. Much official correspondence from this period is rare or nonexistent now, so trying to interpret the documents available will have to suffice. Continuing with Burke's memoirs may shed some light on events (Burke 1946).

> Ever since I had been in forest insect investigations, I had felt that my main interest was the working out of the biology's of the various species. The Northeastern Oregon Control project had gotten me off of the track somewhat but several years away from a control project area had convinced me that I was not interested in control work and that it would be best to return to biological investigations if possible.
>
> Early in 1916 Dr. Hopkins sent out a new plan of organization for comments. This seemed an opportunity for me to make the change so I accepted it. During 1915 the control work had been carried on by the rangers under the direction of Dr. Hopkins in Washington. This had caused more or less friction with the stations. In my comments on the plan, I recommended that all of the work be placed directly under the stations with Miller in charge of the Pacific Slope station at Ashland and that I be placed in charge of a laboratory to investigate the biology's of tree-killing insects. This plan was approved and it was decided to locate my work at Los Gatos, California, with a laboratory giving most of its attention to biological studies with special attention to shade tree problems.
>
> Probably the most important scientific work done at Placerville was the determination that *Oryssus* is parasitic. At least this is the work mentioned in such general works on entomology as Comstock's "Introduction to Entomology" and Essig's "Insects of Western North America." The article "Oryssus is Parasitic" was published in the Proc. Ent. Soc. Washington in 1917. The work done on the flatheaded borers was also published in 1917 as Department Bulletin No. 437 "Flatheaded borers affecting forest trees in the United States."

The Laboratory at Los Gatos, California

> The move from Placerville to Los Gatos was made in November 1916. Because of its growing importance on the Pacific Coast, the work at Los Gatos soon became almost entirely the study of shade tree insects. Scientific Assistant F.B. Herbert was attached to the laboratory from November 1, 1916, to June 30, 1920; Entomological Preparator E.T. Armstrong from November 1, 1916, to October 1, 1917; Assistant Entomological Inspector R.D. Hartman from March 15, 1918, to December 1, 1923; and Entomological Ranger W.E. Glendinning from August 1, 1919, to May 15, 1922.
>
> Among the principal insects studied were the Pacific flathead borer, California oak twig girdler, elder borers of the genus *Desmocerus*, cypress bark beetles, Monterey pine bark beetles, the carpenter worm, California oak worm, penstemon caterpillar, cypress barkscale, European elm scale, *Matsucoccus* scales, madrone psyllid and the unusual lead cable borer.
>
> The time spent at Los Gatos was a time of publication as well as a time of investigation. Twenty-two papers were published on flatheaded borers and various shade tree insects. Among these were Farmers' Bulletin 1076 "The California Oak Worm," with Herbert; and Department Bulletins 838 "Cypress Bark Scale" and 1223 "The European Elm Scale in the West" by Herbert.

There is little other information on Burke's activities during this period except memories of his daughters and family lore that they finally had a home and more settled life in Los Gatos with Stanford University nearby for intellectual stimulus. Mrs. Burke certainly deserved this change after bouncing around for over 10 years following her husband through rural communities and giving birth to daughters Mabel Claire in 1911 in Baker City, Oregon, and Dorothy Eugene in 1914 in Placerville, California.

While in Los Gatos, a son, Harry Eugene Burke, Jr., was born in 1918 and daughter, Janet Margaret, in 1920. Burke said, "This completed the family." To indicate how settled he became, he was elected member of the Los Gatos School Board in 1919. During this period Burke also established a professional relationship with Professor Doane,

J.M. Miller family collection

Mrs. Miller by John's new Saxon auto, 1916.

Automobiles

* John Miller loved them, could repair them, knew their mechanics, and managed to purchase new models on a meager salary and use them in his official travels. Bessie Miller had a near accident on a steep hill in Ashland and would rarely drive after that.
* Harry Burke was not fond of autos or of driving them and was not too knowledgeable about how they functioned. Marion Burke loved the automobile. She was an expert driver, driving from Palo Alto to Yellowstone National Park in 1926 with four young children and a dog in a model T Ford over practically nonexistent roads. She felt the automobile liberated her. She could even change flat tires!

Miller's old teacher, at Stanford University. This relationship ultimately benefited both Burke and Miller and the Pacific Slope Station.

Meanwhile, back in Ashland, there was also activity, at the Pacific Slope Station and for the Miller family. The Station moved to new quarters at the Ashland Normal School in 1916 to accommodate the increased responsibilities and personnel. Both John Patterson and F. Paul Keen passed their civil service examinations and became professional entomologists, there were several entomological rangers on the staff, and the Rogue River bark beetle project had become a sizable research endeavor. The reorganization that Hopkins dictated actually had little added impact on the entomologists at the station because the California District (later Region) and Oregon-Washington District had each assigned a forester to oversee insect control projects on the national forests. Ralph Hopping had been acting in this capacity since Miller left the Service in 1912, and Alex Jaenicke had a similar assignment for District 6 (Region 6) since 1916. However, many private timberland owners had little trust for the Forest Service, so they preferred having Bureau of Entomology men in technical charge of their bark beetle control projects. This resulted in Bureau entomologists acting as a sort of buffer between private and Forest Service interests, and it actually worked quite well on the next large project near Klamath Falls in 1921.

The personal fortunes of the Miller family also improved. Miller must have qualified for and received a raise in pay because of his new position. His son's memories of 1916 indicate the family moved to a larger rental residence and purchased a "new Saxon roadster (Miller, n.d.a)."

Miller's diary for 1917 indicated some major changes in his work related to his new assignment of Station Leader by Hopkins the previous year. To begin with, he rarely went to Hopkins' phenology field sites above town, and there is no mention of the Rogue River Project. Other records indicate that these duties were delegated to Keen and Patterson.

In mid-January he left for Washington, D.C., and Dr. Hopkins' office where he spent the next 6 weeks. He was no doubt being indoctrinated into the intricacies of the federal bureaucracy in general and Dr. Hopkins' operational mode in particular. While there, his diary entries were mostly "worked on correspondence," except for several meetings with Hopkins and Bureau of Entomology Chief, Dr. L.O. Howard, at the Cosmos Club. Visiting the club, whose

J.E. Patterson, PSW

Figure 51—Conference of Bureau of Entomology and Forest Service men at Ashland, Oregon, June 1917. (Top row, left to right) Albert Wagner, John M. Miller, and A.J. Jaenicke. (Bottom row, left to right) F.P. Keen, Thomas Snyder, and Ralph Hopping. Hopping represented Region 5 and Jaenicke Region 6 of the Forest Service. Snyder was on a special trip from the Washington office of the Bureau of Entomology. Albert Wagner, entomological ranger, had just been transferred from the Missoula station of the Bureau, which had been closed down when Josef Brunner left for West Virginia.

membership included the political Who's Who of Washington, D.C., must have been an eye opener for the farm boy from California and now the entomological leader of a research station in Ashland, Oregon.

When he returned to the west coast he was soon on his way to the District 5 Forest Service office in San Francisco, then to Yosemite, cruising a control project in late April, then sick with tonsillitis and an operation in Ashland.

He returned to Yosemite and the Sierra National Forest in June. Then in July and August, Miller and Hopping spent over 2 weeks on a horseback survey of insect conditions in the Little Kern and Kaweah drainages and Sequoia National Park. In September he was again in Yosemite National Park at Patterson's Tenaya Lake Camp.

It appears that personnel from the Ashland station and Miller in particular were encouraged to spend more time and effort in District 5 National Forests and Yosemite National Park (fig. 51). In the summer of 1917, for instance, Patterson was assigned to Yosemite to study the lodgepole needle miner, probably by an envious Miller.

J.M. Miller, PSW

Figure 52—From 1919 to 1924, the station was housed in the residence building (shown at right) in the town of Ashland. This picture was taken in February 1920 following a heavy snow and cold snap in the Rogue River Valley. John Patterson is on the porch.

Patterson devoted most of the summers of 1917-19 to studying the needle miner. This resulted in the first published account of the life history of the insect in the Journal of Agricultural Research, mapping the extent of the outbreak, some excellent photographs of the insect and infested stands, and solid evidence that the heavy mortality of lodgepole pine in the high country was related to defoliation by the needle miner from the 1890s outbreak (Patterson 1921). Consequently, Patterson expanded his studies to include the biology of mountain pine beetle and made important contributions to the knowledge of this bark beetle in high-elevation lodegepole pine stands. The needle miner outbreak finally subsided in 1921.

On October 31, 1917, the station, office, and laboratory in Ashland moved from the old Normal School building to 3rd and C Streets in a large two-story rented house (fig. 52) (Wickman 1987).

But how quickly circumstances can change, there is no mention in Miller's diary of the United States entering World War I in 1917. His entry for July 29 while working in Sequoia National Park says it all "official mail was rather discouraging—I learned that Keen had enlisted."[1]

[1] Keen served in Headquarters Company of the 49th artillery, American expeditionary Force, France until early 1919.

J.M. Miller, PSW

Figure 53—Glendinning watching spruce cants and logging train on Oregon coast. Spruce was an important war material, and production was supervised by the Army, 1919.

J.M. Miller, PSW

Figure 54—Glendinning checking spruce infested with spruce beetle, Oregon coast, 1919.

Miller was not immune from the war fever. On March 29, 1917, he inquired about enlisting in the aviation corps while visiting Stanford University. Because of the loss of Keen, who had taken over the phenology research and the Rogue River project, the Ashland station was short-handed; Miller again helped with some of the phenology observations, although Entomological Ranger Sergent carried the brunt of the work, and Patterson took over the Rogue River Project. Miller, who seemed to enjoy the additional field work, was the entomology representative on a large bark beetle control project on Sequoia National Forest and in Sequoia National Park. He spent much of April, the end of August, and the first half of September on the project with Hopping.

In 1918, new forest insect problems arose in the Sitka spruce forests on Oregon's north coast. Old-growth Sitka spruce is a very light, strong, and fine-grained wood. At that time it was the material of choice for manufacturing airframes and propellers for the fabric-covered biplanes used as fighter aircraft during World War I. It was a strategic material, and the resource was administered by the war department with production supervised by the U.S. Army engineers (fig. 53).

Much of the Sitka spruce in that area in Oregon at the time consisted of immense old trees, many 6 or 7 feet in diameter at breast height. Old-growth Sitka spruce can also be attacked and killed by spruce beetles, degraded by woodborers like ambrosia beetles attacking down logs, and the needles eaten by hemlock loopers. Various reports of insect-caused damage to the spruce and intermingled hemlock were coming to Hopkins from the Forest Service and private timber owners.

In June, August, and October 1918 and May 1919, Miller and Glendinning spent weeks trying to pinpoint the cause of tree damage. What they found was a hodgepodge of insect problems (fig. 54). On surveys from Astoria south to North Bend on the Oregon coast they found defoliation from several previous years and a moth flight at one location (possibly hemlock looper), some spruce beetle, killing trees (but not in serious amounts); ambrosia beetles attacking logs from trees cut in June; and resulting degrade in the wood sufficient to cause the army to reject infested spruce cants. Miller also found an unidentified Cerambycid beetle, *Xyleborus* sp. with larval mining deep in the sapwood of spruce. But most interesting, they found that the browning of the needles on tips of branches that was reported so widespread was being caused by an unidentified green aphid sucking the juices from needles until they turned brown and dropped from the branches. This caused the visual effect of defoliation from caterpillar feeding and had everyone fooled. Miller collected specimens of all of these insects for identification at various times of the year. The aphid was the spruce aphid, and it was indeed a serious tree killer.

Miller mentioned the war only several times in his diary, but the entry for November 11, 1918, summed up the home front's feelings, "worked at station in morning, left for awhile in afternoon to celebrate news of the peace victory."[2] So Keen would be returning, one hoped, by next year.

In December, both Jaenicke and Hopping came to Ashland to spend a week with Miller while they jointly worked on reports. This was indicative of the excellent working relation Miller had with the Forest Service and their two entomological representatives. The year ended cold and snowy as usual, but Miller and Hopping had changes coming in 1919.

Miller spent most of the year traveling to California when not catching up on manuscripts, survey reports, and correspondence at Ashland. On April 17, Keen having been discharged from the Army, arrived in Ashland on the evening train. Unfortunately, he was bearing bad news for Miller. Keen was resigning to work the family farm at Julian near San Diego. This was a blow to the short-handed Ashland station. Keen was a University of California graduate trained in forestry and entomology (Wickman 1987). He was doing excellent research, particularly on the WPB, essentially running the Rogue River project until he left for the war in 1917. As usual Miller made no personal comment about the situation, but it did leave him with only Patterson as his professional assistant. Requests for assistance from the station were increasing in several areas in southern Oregon and in California, particularly Yosemite National Park and the Sierra National Forest. In southern Oregon just north of Klamath Falls, mostly on the Klamath Indian Reservation, a very large pandora moth outbreak was defoliating thousands of acres of ponderosa pine forests. Patterson was assigned to study this heretofore little-known insect as well as complete his studies of the lodgepole pine needle miner and mountain pine beetle in Yosemite National Park. Miller, as was his management style, visited the outbreak areas with Patterson, gave him some advice, then turned him loose. This approach seemed to be successful most of the time.

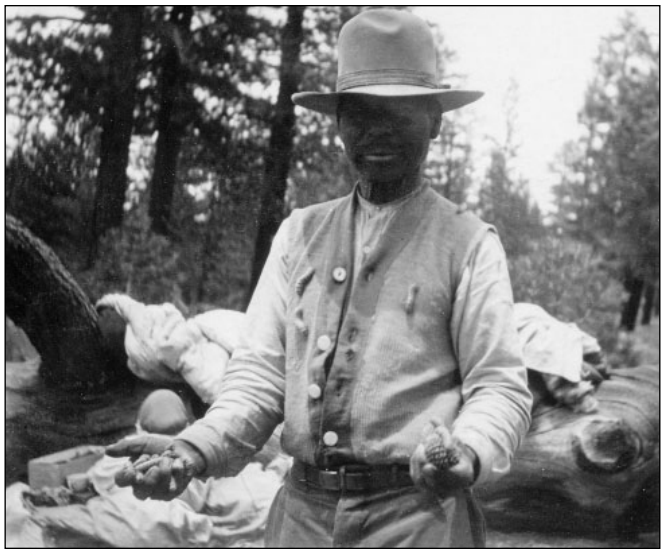
In May and June, Miller was back on the Sequoia National Park project with Hopping. In addition he, Hopping and entomological ranger Wagner were examining stands at Frazier Mountain, near Tejon Pass, Figueroa Mountain, and the coast range near San Luis Obispo. The far northern Pacific coastal areas were also of concern, especially in Alaska. The Forest Service reported huge areas around Ketchikan, Admiralty Island, and Juneau being severely defoliated by caterpillars (possibly hemlock loopers or blackheaded budworm). They requested help from Hopkins. Miller investigated the cost of boat fare to Juneau. Unfortunately it was $80 round trip—too much for their strained budget, so Miller never went.

In August, on his way to Yosemite via the east side of the Sierra, he did score a first for forest entomologists. He recorded: "August 4, 1919—Camped at Mono Lake R.S., August 5 Leevining, Mono Lake, Ranger Greene states that the "Peages" [sic] gathered by the Indians in the Fall are species of caterpillar, very large—from a large beautiful moth [pandora moth] Indians build a fire under the tree [Jeffrey pine] to smoke down the larvae—gather every other year—1 year moths fly—the next year find larvae—1919 year of flight." Patterson was starting to study the same insect on the Klamath Indian Reservation, only the developmental phases were not synchronized—1918 was the year of moth flight in Oregon (figs. 55 and 56). Pandora moth larvae

J.E. Patterson, PNW

Figure 55—Ponderosa pine defoliated by pandora moth on the Klamath Indian Reservation, 1924.

[2] There was a celebration in downtown Ashland as there were in towns across America. Office and other work came to a halt as communities let off steam and gave thanks for the end to the killing of their young men.



Guy Wray, USDA Forest Service

Figure 56—Jake Garrison, Mono Chief, with a handful of live "peaggies," pandora moth larvae.

and pupae were indeed an important source of protein for several Native American tribes.

On August 8 he reported " . . . the entire stand of lodgepole pine around Tuolumne Meadows looks as bad as Tenaya did in 1912—7 years ago—all one can see is a forest of dead tops." The needle miner had progressed eastward, but this was the last outbreak expansion, as populations waned in 1921.

The rest of August and September, Miller was almost continually in the field with Hopping checking the control work around Sequoia National Park and other areas in southern California.

Miller stopped in San Francisco several times on his return trips to Ashland and met with Assistant District Forester Woodbury. During these trips he almost always went down to Los Gatos to visit and confer with Burke. The frequency of the visits seemed to indicate he valued his colleague's counsel, and his diary usually says "took dinner with the Burkes."

On November 19-24, 1919, there was a meeting of entomologists at Ashland; Miller and Patterson and foresters Hopping and Jaenicke from California and Oregon, and Evenden, a new Bureau entomologist from Idaho. They met to discuss the coordination of bark beetle surveys and research in the three states. It was called the "Ashland Conference" and it led to changes for Miller in 1920.

The team was going to lose a valuable member, however. Ralph Hopping, his long-time Forest Service compatriot and close friend, had accepted a job with the Canadian Forest Service as a Forest Entomologist.[3] On December 10, 1919, Miller met the northbound train at Ashland and rode as far as Grants Pass with his colleague, friend, and horse-packing buddy as he passed through on his way to Canada. The lonely return trip to Ashland must have been a reflective one for Miller. Some of his earlier diary entries record the following memories with Hopping:

> January 18th, 1917 (en route to Washington, D.C.)
>
> At 10:30 pm ferried the Mississippi on a flatboat and arrived at New Orleans at 11:30. Found transfer to consist of old fashioned cab. After some delay went to several hotels, found them all filled up. Finally found cots in a Turkish bath with a party of 6 others one of whom snored outrageously.
>
> July 29, 1917 (on horse pack trip surveying insect conditions Sequoia N.F and N.P)
>
> Spent day at Giant Forest working on insects. Hopping left at noon for Three Rivers to get supplies for the remainder of our trip. Official mail was rather discouraging for the reason that I learned that Keen had enlisted and matters pertaining to the survey were in bad shape.

[3] Hopping eventually retired in Canada, and his son George also became a forest entomologist and noted taxonomist of Scolytids for the Canadian Government. Both men had the distinction of being officers in charge of the Vernon, British Columbia, Forest Insect Laboratory. I knew George quite well, but we never discussed his famous father.

CHAPTER 12: Burke and Miller Move Again—1920-1922

> In December of 1919 we had heavy snows in the Ashland area which produced the first white Christmas I had ever enjoyed. A new sled was perfect for sliding down the Bush Street hill. At Christmas time that year, Mother and Father told me of the impending move to California, but the significance was lost on me. I was not impressed with the place on our visits there and it seemed very hot (we always traveled in the summer) and none of it was as exciting as Ashland. Came the days of packing our things, and then, on a sunny winter morning in January, 1920, we were on the train headed south. The Ashland days, alas, were over, albeit they were very happy and secure days for me."(Miller, n.d.a)

The 6-year-old son of John and Bessie Miller thus remembered the move from Ashland to his new home in California. He knew nothing about North Fork, California, but his father did. It was the location of the supervisor's office for the Sierra National Forest; the forest where he started his professional career as a Forest Ranger in the U.S. Forest Service in 1909-10. They were moving there so Miller could start a new field station for the Forest Insect Division. Miller describes the move as follows (Miller and Keen, n.d.):

8. North Fork, California, February 1920–November 1924

The results of research on biology and habits of the western pine beetle at the Ashland station, in addition to unsatisfactory results on a number of control projects led to the development of new ideas which offered some promise of application in control practices. The Forest Service became interested and an agreement was reached with the Division to test several of the proposed theories on experimental projects. This program was outlined in what became known as the Ashland Conference Plan [1919] that called for a series of experiments in the San Joaquin River drainage of the Sierra National Forest.

A field station was provided for at the Forest Supervisor's headquarters at North Fork in order to carry out the Division's part of this project. J.M. Miller was in charge with from 1 to 3 assistants during the period of the project. The tests which were run applied to the percentage principle of control as advocated by Dr. Hopkins, the effectiveness of continued maintenance control to prevent epidemics, and the costs and efficiency of control work during the summer period with the use of the newly discovered solar heat method of destroying the beetles [fig. 57].

In addition to the experimental control program the North Fork station carried on research dealing with other phases of the western pine beetle problem and maintained technical service for a number

A.J. Jaenicke, USDA Forest Service

Figure 57—Mr. Kimball's party at Spencer Creek when a test was made of solar heat control during the SONC Project near Klamath Falls, Oregon, 1921.

of control projects that developed in other parts of the ponderosa pine region.

Miller remained in charge of the Pacific Slope Station, but his headquarters was now at North Fork, California.

The Ashland station was maintained with Patterson in charge assisted by Sergent. In this manner, both the Rogue River research project and new studies at North Fork on the Sierra National Forest could be carried out simultaneously. Although without Keen, both Patterson and Miller had heavy workloads.

Forest Service living quarters were practically nonexistent in North Fork for the Miller family in early 1920, so Bessie and their son remained at Reedley until something habitable was found. After living in a tumbledown shack for a while at the old Site Rock Ranger Station, about 2 miles from North Fork, the family moved to slightly better quarters just above South Fork. This was the old Douglas Ranger Station, and after Miller put a new shingle roof on it, the family moved in. It was home for the next 3 years. Eventually, a one-room shingle shack (ex-tool house) was moved from the Douglas Station to the North Fork supervisors' headquarters (fig. 58). This became the office and laboratory of the forest entomology station until Miller left in 1925. Miller's son, Harold, wrote a delightful description of his new home and North Fork through a child's eyes (Miller 1997).

J.M. Miller family

Figure 58—Former tool shed that served as the first forest entomology station office and laboratory for Miller at the supervisor's headquarters, North Fork, California, 1920s.

Miller's entomology work during this period was varied and far flung. From April through July 1920, he was cruising timber for bark-beetle-killed timber and checking control work from camps on the Sierra National Forest. This was called the San Joaquin project and extended from near North Fork south to the Sequoia National Park area (figs. 59 and 60). It involved much horse riding and camping, which Miller always enjoyed. However, according to

J.M. Miller, PSW

Figure 59—Insect control crew at Chiquita Basin, Sierra National Forest, 1920s.

J.M. Miller, PSW

Figure 60—Cook at the Shuteye insect control field camp, Sierra National Forest, 1920s.

his diary, on June 1, he gave important testimony to a meeting of the California Forestry Committee in San Francisco (see next page).

Miller supervised or assisted with many other projects as well. In late August, he was in northern California helping Patterson with the Antelope Project near Weed. Next he went to Klamath Falls to check a test of fuel oil sprayed on the bark of infested trees, and then ignited. The method was visually spectacular, but failed to kill the beetle brood in the bark. In September he was the first forest entomologist to visit the Warner Mountains in northeastern California. He examined the Sugar Hill burn of 1917 where extensive tree killing was taking place around the burn. (This area was again studied by C.B. Eaton in 1940 and by myself in 1957 for outbreaks of mountain pine beetle in second-growth ponderosa pine). Then he proceeded to the Lassen National Forest near Bogard Ranger Station and was the first forest entomologist to visit Butte Lake (probably to fish) in Lassen National Park. By late September he was in the Chiquita Basin and the San Joaquin project. In October and November he was mostly in North Fork with his family; his diary for November 17-18 notes he "shingled and repaired roof of the Douglas Station." During these months he also had two meetings with Burke in Los Gatos. They were not working together on any projects at that time, but it was evident he valued Burke's counsel.

The year 1921 again resulted in some changes for Burke and the Forest Insect Station's future status and location. Burke's recollections continue.

The Laboratory at Stanford University, California

A reduction in the appropriations for the fiscal year 1921 caused the resignation of Herbert and I decided to look for a new location where laboratory expenses would be small. Stanford University offered laboratory space rent free so I moved to Stanford in March 1921. Officially the move was made November 1, 1921.

For the first few years the work at Stanford continued as at Los Gatos. The investigations of the Pacific flathead borer and the lead cable borer were completed. Bulletin 1107 "The Lead-cable borer or Short Circuit Beetle in California" was published December 4, 1922, and reprinted July 1923 with R.D. Hartman and T.E. Snyder as co-authors. The work on the Pacific flathead borer was submitted as a thesis to Stanford University and I received the degree of Doctor of Philosophy June 15, 1923.

What Burke's memoirs do not mention is that Professor Doane at Stanford University was also an important colleague of Miller's from his earlier student days and likely of Burke as they were probably the only two entomologists in the immediate area. It would be interesting to learn more about the details of Burke's move to the Stanford campus, because it foreshadowed a move of Miller and of all the entomologists to Stanford University within a few years. Perhaps Burke was doing the political groundwork convincing Stanford University administrators that such a move would benefit both parties.

Before this happened, however, there was one more field station established by Keen at Klamath Falls in 1921. Keen had returned to the Bureau of Entomology the previous year finding entomological science more to his liking than farming. This was fortuitous, because Kimball, Hopkins' nemesis from a few years earlier, was again raising the alarm. Only this time the western pine beetle was indeed killing trees in the Klamath Basin in alarming numbers, on private as well as Forest Service and Indian Reservation lands. Miller describes the situation as follows (Miller and Keen n.d.):

9. Klamath Falls, Oregon, January 1922–November 1925

Since the closing down of the first station at Klamath Falls [Parker Station, actually] in 1912, increasing western pine beetle infestations in the Klamath Basin of Southern Oregon from 1918 to 1920 had impressed the private timber owning agencies with the need for action. As a result pressure was brought upon the U.S. Department of Agriculture for an aggressive program of surveys and control. A meeting was held at Klamath Falls, Oregon in April 1921 sponsored by the Klamath Forest Protective Association which included all of the large holders of ponderosa pine timber in that section, and was endorsed by representatives of the leading pine owners throughout the western states.

Stewart Edward White Takes on the U.S. Forest Service Fire Policy

Miller became involved in a fire and bark beetle controversy when a noted author, Stewart Edward White, wrote an article for the April 1920 issue of *Sunset* magazine (White 1920b).

The article touted the benefits of "light" burning in California forests. White was acting as an articulate mouthpiece for the proponents of light burning (what we would call underburning today). Most of the profire advocates were private timber owners who thought that burning the underbrush and smaller trees promoted tree growth, facilitated logging operations, and killed bark beetles, which many believed spent part of their life cycle in the duff under trees. White contended that the Forest Service was not doing enough to control tree-killing bark beetles and argued that underburning the forests would kill beetles by smoke and heat in the litter and even in infested standing trees.

Sunset magazine published a rebuttal in May by Chief Forester Graves, who very diplomatically depicted the use of fire in such a manner as both dangerous and counterproductive to sound forest management (Graves 1920). (This was just one decade after the terrible forest fires of 1910.) He further pointed out that White's biological facts concerning the control of bark beetles by burning them in the forest litter and infested trees did not match the knowledge of the Bureau of Entomology professionals. He did not say it bluntly, but the inference was that White's wild claims on the use of "light fire" to control bark beetles was utter nonsense.

Sunset published a short reply by White in the May issue (White 1920a). White was courteous and claimed he didn't want to start a controversy, but he did not back down on his claims over the benefit of fire either. He asked that the Forest Service participate in some burning experiments on the Southern Pacific Railroad Company's forest lands.

At this point, District 5 Assistant Forester Woodbury and State Forester Hodge formed the General California Forestry Committee chaired by Donald Bruce with several others, including Dr. E.C. Van Dyke, a professor of entomology at the University of California. The committee seemed to be formed for one purpose: that was requesting J.M. Miller to come to San Francisco on June 1, 1920, and give them a briefing on the relations of fire and bark beetles. Miller was called on very short notice and came directly from fieldwork on the Sierra National Forest. He gave a summary of his research on bark beetle relations to wildfire, the biology of bark beetles, and current methods used to control them. He essentially demolished the claims made by White in his *Sunset* magazine articles, and he was further backed by Professor Van Dyke over the particulars of bark beetle life histories. The minutes of the meeting (Anonymous 1920) claim that White was invited to attend the meeting but did not show up.

After almost 3 hours of presentation by Miller and questions and general discussion, the meeting adjourned. Miller never alluded to the subject again in his diary or publications.

The premise that prescribed fire could be beneficial for the health of some pine forests was correct, but the reasons given for practicing it as a forest management tool were wrong. It took another three decades before Professor Harold Biswell of the University of California Forestry School started experimenting and promoting the use of "light fire," and his was a lonely voice for three more decades. Now prescribed fire is not only an accepted forest management tool, but is recognized as an integral part of many fire-dependent pine forests in the West.

The *Sunset* magazine articles, however, had a positive side in that they publicized the growing problem with bark-beetle-caused pine mortality in California. Miller also must have taken note, because he used self-described "propaganda" a decade later when the bark beetle problem was reaching epidemic proportions, and he was seeking increased appropriations from Congress for research.

As a result of this meeting, action was initiated to secure Federal appropriations to enable the Forest Service and Indian Service to conduct control work on their own lands and to cooperate with the private owners in a comprehensive control operation embracing 1,267,000 acres of ponderosa pine forests.

In September 1921 A.J. Jaenicke was assigned to Klamath Falls to work on this situation. The first step was to run surveys to determine the extent to which the infestation involved the multiple ownerships of the Klamath Basin. In the survey program, Jaenicke was assisted by F.P. Keen from the North Fork station, J.E. Patterson of the Ashland station and J.C. Evenden of the Coeur d'Alene station.[1] As a result of the information that was secured and the recommendations that were made, a special appropriation of $150,000 was secured for control work on Federal lands and for the necessary technical service by the Bureau of Entomology. The Klamath Forest Protective Association assumed the obligation for financing the work on private lands. This program which extended over a period of 3 years became known as the Southern Oregon-Northern California Pine Beetle Control Project.

Control work was started in the winter and spring of 1922. A field station to carry out the functions of the Bureau of Entomology was established with project funds early in 1922 with F.P. Keen in charge. General administration, coordination of work and fiscal control of the project was handled under a Board of Control consisting of a representative of the Forest Service, Indian Service, private owners and Bureau of Entomology. Keen as Bureau of Entomology representative was elected chairman of the Board. Keen recruited a staff of men and trained them as spotters in the details of survey and control methods. The Klamath Falls station was continued until November 1924. By that time the original appropriation was exhausted and the private owners decided to continue the work on a more independent basis.

Miller was involved in the planning of this project and establishing a temporary station from the beginning. Even though he was deeply involved in his own research on the Sierra National Forest, he made every effort to visit and become a leader of his men in this new venture. By mid-August 1921 he was on his way to Klamath Falls where he met with Patterson, Keen, Jaenicke, Kimball, Pollard, and King. These men were the principal leaders in this new project and it was the first time they had all met together. For the next several weeks Miller was in the area visiting pandora moth infestations with Patterson at the Sprague and Williamson Rivers on the Klamath Indian Reservation. He was also trying to catch up with a motion picture crew led by a Mr. Perkins who were filming insect outbreaks and control actions in the area. This was a first in the efforts to publicize the timber losses caused by insects at the time. Miller frankly mentions in his diary the intent of this "propaganda." Miller eventually caught up with the movie film crew on the Sierra National Forest where they spent a week filming the insect control project and affected stands of trees. The strategy must have worked because as Miller has already mentioned, a large special appropriation was secured from congress to undertake an insect control project in southern Oregon and northern California.

Miller's management style was commendable given the poor communications and transportation of the era. He rarely failed to visit his entomologists and entomological rangers in the field as new projects developed. He delegated authority to these men to get the job done, but he also provided technical advice on the ground and was not shy about camping and doing physical labor as needed. An interesting notation in his diary refers to "The Burch bed sheet, tent and sleeping bag. E.G. Burch Mfg. Co., Pueblo, Colo." He probably spent more time during this period sleeping in a tent or on the ground than at home. The amount of travel he undertook was prodigious. For instance, starting March 1922, a time when he could normally remain in North Fork writing his reports and doing research, he spent 2 weeks giving technical advice to the Forest Service on a bark beetle control project at Arrowhead Lake near Los Angeles, but at least he could take his family with him to spend time with his mother who lived in Pasadena.

Miller's work in the remainder of 1922 followed a familiar pattern. In May he went to Klamath Falls for meetings with Patterson, Keen, and Kimball; in June, more examinations of the Figueroa Mountain and Arrowhead Lake projects; and, in October, a 2-week trip to check a very large bark beetle infestation on the Mendocino National

[1] The hiring of Evenden and formation of the Coeur d'Alene station has been described in Furniss and Renkin 2003.

Forest extending in patches of dead trees from Alder Springs in the North to Upper Lake and the Eel River in the South. This outbreak was the result of large amounts of windthrown timber from a storm in January 1921 (Miller and Keen 1960).

But on November 1 there is a mysterious diary entry as follows:

> Went to the forestry school at Berkeley, California, met Professor Metcalf and made appointment with Professor Mulford [Dean of School of Forestry, University of California] 12:15 discussed the matter of occupancy of room in basement of Hilgard Hall. Mulford advised putting material or furniture in room so that there would be no cause for complaint from the University because of demands by others for space.

What was going on? Burke was located at Stanford University, in supposedly free quarters, Patterson was renting a house in Ashland as a substation, Keen was located in a substation at Klamath Falls, and Miller was in an old tool shed at the Sierra National Forest Supervisors office. A pretty far-flung and expensive quarters proposition for a poorly funded federal agency. In further comment on the Berkeley development, Miller wrote on November 15 and 16: "Drove to Berkeley stored breeding material from North Fork in room in Hilgard Hall–looked for house in Berkeley.

He spent the entire next day looking for housing. Did Miller feel that some kind of headquarters change was going to be forthcoming from the Washington, D.C., office? Was he a little jealous of Burke's ties to Stanford University and felt that quarters at the University of California Forestry School were more appropriate than the tool shed? Was he just testing the waters with Hopkins? Was change, which seemed to be the order of the day for the forest insect station, once again on the horizon?

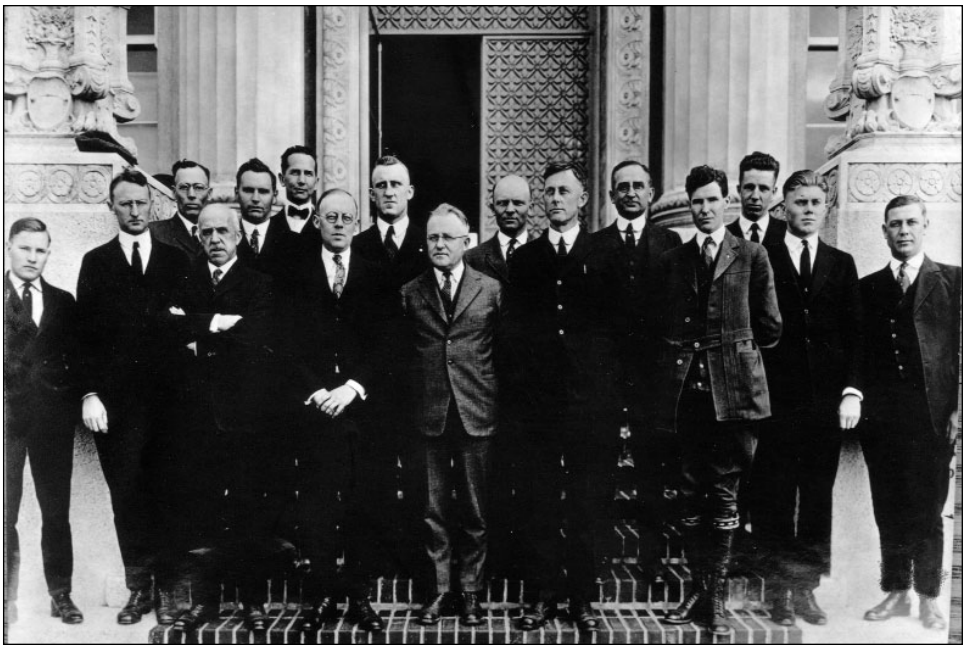


Figure 61—Attendees of the 1923 Forest Insect Conference, University of California Forestry School, Berkeley, California.

CHAPTER 13: A New Chief in Washington, D.C.–More Reorganization, 1923-1924

Government workers often live by a mantra that budgets rarely increase though workloads usually do, and whenever a new "Chief" takes charge, reorganization closely follows. In 1923, this was not necessarily true on the first count because half of the Forest Insect Station staff was benefiting from the new $150,000 appropriation for the Southern Oregon–Northern California (SONC) project. But, on the second count, a new organization was in the works. Burke tersely describes the coming change in his memoirs. "In the fall of 1923, Dr. Hopkins retired as chief of Forest Insect Investigations and Dr. F.C. Craighead replaced him. This caused some reorganization of the work and the discontinuance of shade tree insect investigations in the west for a time."

Probably because of the impending change in leadership, the first large-scale conference of forest entomologists and foresters concerned with insect depredations was organized by Miller and others. It took place at Berkeley, California, February 5-10, 1923. It was simply called "The Forest Insect Conference," and it was held at the University of California Forestry School (Anonymous 1923). Interestingly, no Washington office staff attended (fig. 61).

Miller was elected the program chairman and presided over a series of papers summarizing all of the control projects and knowledge and research to date on the most important Western forest insects. Because many of the reports involved studies in progress and older studies never completed, it was not intended for publication. The meeting was informational for people working on forest insect problems in the West with question-and-answer sessions after each paper. The intent was to get all involved workers updated and familiar with the status of the forest insect problems, the state of current knowledge and research programs, and where the next logical steps might be taken. The attendees also made detailed recommendations on the future organization of Western Forest Insect Division stations and presented them as a resolution to Hopkins. Such a gathering was valuable for a new leader coming on board, and Hopkins and Craighead's subsequent approval of the reorganization of Western Stations in December 1923, indicate they paid

attention to the report.[1] Included in the resolutions was one recommending Miller be chosen as leader of Western Forest Insect Investigations.

The conference was timely because the number of forest insect infestations in the West was rising, and, in the case of bark beetle control efforts, thousands of dollars were being spent. Were the benefits justifying the costs? This was the underlying question and it motivated much future research on the effectiveness of control projects to reduce subsequent timber mortality.

Some of the study reports presented during the conference would be crude science by today's standards, but there were few statistical methods available at that time, and sometimes a study could not be completed because of other pressing duties or lack of funds. What is evident in the reports is the tremendous amount of raw data accumulated on bark beetle counts, infested trees per acre, cruises of infestations, and followup examinations after control projects (fig. 62). All of this work was done with primitive transportation and living conditions. What the study reports lacked in statistical and ecological sophistication they made up for in sheer volume of raw data related to a new specialty in entomology.

The question-and-answer sessions also indicated that these men were professionals of good will; trying to advance their science not themselves.

The Berkeley conference may also partially explain why Miller needed a room in Hilgard Hall on the university campus. Perhaps he needed it to store materials related to the conference. But it doesn't explain why he brought insect breeding material to the room or spent a day looking for

F.P. Keen, PNW

Figure 62—Parade float of the SONC Pine Beetle Control Project, October 1923.

housing in Berkeley. Perhaps he felt that one result of the conference would be a recommendation to locate the Forest Insect Station at the University of California School of Forestry and the newly formed Forest Service Experiment Station there. If so, he was to be temporarily disappointed.

There were several policy recommendations posed during the conference. The first was a reorganization of the Western stations; the second, was the establishment of a Western forest insect newsletter.

To present the first proposal, Keen was posted to Washington, D.C., in March to work with Dr. Hopkins and confer with Bureau of Entomology and U.S. Forest Service and Park Service officials. While there he also updated people on the status of forest insect problems in the West by giving a series of illustrated presentations. At that time Craighead had not been officially declared chief of forest insect investigations, so there was a movement by Western Timber Company people to promote Miller for the job. Probably, unbeknownst to the Westerners, Craighead had been the choice for some time by the Washington, D.C., establishment. Hopkins and L.O. Howard, the Chief of the Bureau of Entomology, approved the reorganization in principle, but there were no final decisions made about the reorganization while Keen was there. Keen did prepare a confidential memo to the Western entomologists upon his return, which clarifies some of this.

Keen's memorandum follows verbatim.

[1] Frank C. Craighead was born in Pennsylvania in 1890. He obtained a B.S. degree from Penn State College in 1912 and Ph.D. degree in entomology from George Washington University in 1919. Hopkins first hired him to work in the Forest Insect Investigations Division in 1911 while he was a student. Craighead spent several summers working in various regions of the United States including assisting in a postcontrol survey of the N.E. Oregon Project (fig. 13). Hopkins appeared to be grooming him for a permanent position in the Division, but in 1921 Craighead took a position with the Canadian Department of Agriculture. In 1923 he returned to the Division as chief, replacing Hopkins. He retained that position until he retired in 1950. His retirement was in name only for he continued to publish numerous articles and five books on various environmental subjects. He was a consultant and collaborator for the Everglades National Park. In 1969, the U.S. Department of the Interior gave him the Conservation Service Award. He died on May 14, 1982, at his home in Naples, Florida (May 1982 obituary, in my possession, from an unknown Florida newspaper).

Memorandum for Western Field Men Confidential

My trip to Washington, which was decided upon at the Berkeley Conference, came at a most critical time in the affairs of Branch, namely, at a time when a change of administration was under way. It was filled with thrills and many lurid moments, many of which cannot be incorporated in a report of this kind. However, I shall try to give an idea of what transpired, but will of necessity have to leave out some of the most interesting details.

On arriving in Washington I soon found that this was to be my biggest task. Very few had heard of what the Branch was doing or that we even existed.

My first interview was with Dr. Quaintance, Acting Chief of the Bureau. He was very much surprised at the size of the Southern Oregon Project and at the support which was being accorded to it by the Forest Service and the private timber owners.

I next had an interview with Dr. Ball, Assistant to the Secretary, accompanied by Dr. Quaintance and Dr. Howard. This was a most unsatisfactory interview. Following this there were interviews with Col. Greeley, of the Forest Service, J.B. Kinney of the Indian Service, and Dr. Marlatt of the Federal Horticultural Board. They all showed a most active interest in what we are doing and were very much surprised in the comparative losses from fire and beetles which was illustrated on pictorial poster which I had prepared for the Berkeley Conference.

Dr. Ball did not know last year that beetles were of any importance whatever as tree killers. Dr. Marlatt was not acquainted with the methods used to combat them. This goes to show how great is the need for adequate publicity and educational work, for if members of our own Department are not conversant with what we are doing how can we expect the general public to be informed?

I gave a short talk at the meeting of the Washington Entomological Society using the fire-beetle poster and colored maps of the project to illustrate the work.

On March 22, I gave a scheduled talk before the Washington Section of the Society of American Foresters using slides and diagrams as illustrations. The talk seemed to arouse a great deal of interest as it was followed with about fifteen minutes of rapid fire questions from the foresters on all phases of the work.

For some time Dr. Hopkins has wanted to be relieved of the administrative work of the Branch in order that he may devote his entire time to research in bioclimatics. On arriving in Washington I found that Dr. Swaine of Canada had been offered the position, although Dr. Hopkins had not been consulted. I felt that, should Dr. Swaine not accept, some consideration should be given to the effect of a change of policy upon the Western work, so did what I could to bring to the attention of those concerned the fact that we had accomplished a great deal here in the west, were doing a great deal now, and had assumed a lot of responsibilities that should not be overlooked when such a change was made.

The private timber owners, with whom we have been cooperating, upon learning of the contemplated change took an extremely active interest in the affair and deluged the Secretary's office with telegrams advocating Mr. Miller's appointment to this post. This, of course, reacted unfavorably towards Miller and under protest from Dr. Howard and myself the propaganda was stopped in-so-far as it applied to Miller, but they are continuing to endorse the work that we are doing as they feel that any change of policy might affect their pocket-books. So far no decision has been reached as to who will be named as Dr. Hopkins' successor. We have hopes, however, that it will be someone who is not antagonistic to the present policies.

I could write a book on this subject, but am not going to. Other matters taken up during the detail are given in the Western News Letter.

I must not neglect to mention one very important result of the trip which was the development of a closer friendship and more cordial relationship with the men in the Eastern Division. Contact with Dr. Hopkins was a real inspiration, and I could not help but regret that I had not known him better in the past.

Mr. Snyder is a square shooter and thoroughly in sympathy with our Western work. I hope that he is selected to succeed Dr. Hopkins. We could not wish for a better friend.

Middleton is a fine clean cut fellow with a lot of splendid ideas and a very likable personality. I was glad to be able to know him better."

Mrs. Carter proved herself a real friend in straightening out my fiscal troubles (and they were bad ones at that). She is a very capable and efficient clerk as you probably all know, and one to tie to if you expect to try any funny business with the fiscal regulations.

The others in the office included Mr. Murray, who is helping Dr. Hopkins with his bioclimatic studies, and Miss Ritchie and Miss Gass, the stenographers. They were all very cordial and pleasant to know.

I met a great many other pleasant people both in the Bureau and on the outside. But for Washington in general, the less said the better.

The proposal for a Western newsletter was approved by Hopkins and L.O. Howard. The first issue was prepared by Miller at North Fork; a facsimile follows:

North Fork, California April 16, 1923

NEWS LETTER–WESTERN DIVISION
Forest Insect Investigations–Bureau of Entomology
U.S. Department of Agriculture

As the plan of organization for a Western Division of the Branch of Forest Insects as accepted at the Berkeley Conference, February 5-10, 1923, has been approved by Dr. Hopkins and the Chief of the Bureau, it is desirable to get the organization underway as soon as possible.

The plans for some sort of a news letter as a medium for keeping the widely separated western stations in touch with each other and in line with policies was favorably considered at the Berkeley Conference. There is little doubt but that this letter will serve a most useful purpose and its success will depend upon the cooperation of the Western field men. We will try to get this out at least monthly to include such items as the following:

1. Movements of personnel at Western stations.
2. Accounts of special field trips or investigations.
3. Progress of projects.
4. Discussion of topics and policy matters in which all stations are interested.

Contributions of this nature can be sent to North Fork in pencil draft and we will try to take care of the typing here. Suggestions as to the name, form, or contents of these news letters will be welcome. This issue represents our first attempt. As no announcement has been made news matter from the other stations did not come in.

Let's make the next letter a real one.

Although the exact details of reorganization remained to be worked out, the newsletter Summarized Keen's understanding of the Washington office plans to date as follows:

THE WASHINGTON DETAIL

Mr. Keen gives the following account of his Washington detail which followed the Berkeley Conference:

1. Western Organization.

At first it seemed rather useless to go ahead with our plan of western organization since the administration of the Branch seemed so uncertain. However, upon advice from Mr. Miller steps were taken to secure the approval of this plan and with some modifications suggested by Dr. Hopkins it was approved by him and Dr. Howard, and can now be considered as in effect.

Under this plan it will be best to take up all matters affecting policy, administration, advice, criticism of reports, cooperation, etc., thru Mr. Miller; matters which before have gone direct to Washington should be handled thru Mr. Miller, since he is better informed as to local conditions than is the Washington office, and Dr. Hopkins cannot afford to spare the time from his bioclimatic research work to go into all these details.

It will be best to take up matters of allotments, increases of authorization, station needs, etc., thru Mr. Miller as he can then keep track of the funds available, and use our meager appropriations to the best advantage.

Under the advice of Dr. Ball authority has always been granted the field men to publish articles of local interest in local papers or periodicals after approval by the District Office which in our case is Mr. Miller. Periodicals such as the Timberman is especially included in this category. (Par. 171 Administrative Regulations).

So Miller's suggestions, with support from other Western forest entomologists and state and federal cooperators, played a major role in how the Western stations would be reorganized.

There is no inkling in his diary that he was now leading the pack, but from Keen's comments in the newsletter, it was obvious that Miller was going to be playing an expanded role in the management of Western forest entomology. His title had even changed from "assistant entomologist" to "entomologist." Nary a word in his diary about his promotion. He was not one to toot his own horn; he had been too busy quietly leading by example. By October 1923, Craighead had officially replaced Hopkins, and he wrote a short article for the Western newsletter describing his goals.

A newsletter facsimile follows. Notice that the newsletter is addressed to "men." No women were in the profession in 1923!

NEWS LETTER–WESTERN DIVISION
Forest Insect Investigations, Bureau of Entomology
U.S. Department of Agriculture
North Fork, Cal.–Oct. 1, 1923.

TO THE MEN OF THE WESTERN DIVISION.

I suppose you have all been wondering what is going to happen next, now that a new head of the Division has arrived in Washington. Just to relieve any anxiety right at the start, I am going to say it will be nothing radical; whatever changes do take place will be after we have all gotten together and seriously discussed the work.

In accordance with Mr. Miller's suggestion I decided the use of the official organ (Western News Letter) of your well-organized Western Division would be the best manner of putting before you some ideas I have for the future. It will be less formal than a letter to each of you and you can all come back (as I see you do at one another), which is just what is wanted.

In the first place I feel that our Division is primarily a research organization with the object of rendering service. We have a part to play in the development of an efficient forest policy for this country and as time goes on it will become a more and more important part, as has that of field crop and horticultural entomologists in agriculture.

The Forest Service and the private foresters, particularly those of the Northeast, are coming to realize more and more the importance of the entomological problems in their efforts to manage the timberlands. This argues well for us and will continually open larger fields for our endeavors. Another angle of all this is that we should not lose sight of a bigger and broader objective when digging down into the details of our pest problems.

To accomplish such results it is necessary, with our limited resources, to do thoroughly everything we undertake. We should not take anything for granted until we have a sufficient array of data and facts to substantiate it and present it in such a manner that it is open to fair criticism. It may be well to limit our projects to a relatively few in number and hammer away at these from all angles. As an example, I might suggest a serious defoliation, since I have been particularly interested in such a problem the past three years and feel that in the future after our mature forests are gone such insects will be our most serious pests. It is first necessary to know in great detail the seasonal history and feeding habits of the insect–not only on individual hosts or under laboratory conditions but in its broader ecological aspects, in relation to all forest environments. It is necessary to know the physiological effects of defoliation on the tree, the relation of secondary insects to the current annual growth of the tree, and the relationship between the vigor of defoliated trees and recovery. Such ramifying ends will immediately suggest the question, how can we do it? The answer is cooperation. We must seek help from the forester for his conception of the forest types and quality sites, as well as on the relationships between tree growth and defoliation; from the plant physiologist and plant mycologist we can get assistance on his phase of the problem.

We are endeavoring to establish a forest insect station in the Northeast to cooperate with the New England Forest Experiment Station. Mr. Dana will represent the Forest Service and Mr. Pierson the Division (for the present in a temporary capacity). From the start the effects of budworm defoliation on the current annual growth will have to be considered in the yield studies undertaken by the Experiment Station. I cite this as an example of how we can be of service right at the opening of the station.

In selecting our problems in the future I feel that we should consult the Forest Service and endeavor to undertake lines of investigation that will be of most immediate and direct importance in carrying out their policy for that particular region.

I hope we can develop a spirit of endeavor for the Division as a whole, such as that developed in the West. We should endeavor to let the other fellow know what each of us is doing and come back at one another with constructive criticism and suggestions. I feel myself that the result of any problem I undertake is not so much a personal creation but that it is merely my interpretation of natural events. Any suggestions that will help to get nearer the truth of the situation will be welcomed.

Although the preceding discussion relates more directly to purely forest insect problems, the same general principles will equally apply to our other lines of work–forest products, shade tree insects and nursery problems.

Continued

F.P. Keen, PNW

Figure 63—Forest Service Chief Colonel Greeley (far right) with entourage at the SONC Project, 1923. (Left to right) J.F. Kimball, Hal H. Ogle, A.J. Jaenicke, S.R. Black, George Cecil, Gilbert D. Brown, W.J. Rankin, J.M. Miller, E.E. Carter, Colonel William B. Greeley.

> I feel that I am not saying much that is new to all of you. From reading your News Letters during the past summer I have been greatly impressed with the excellent manner in which you all are undertaking your various investigations. I look forward to meeting you all at the conference this fall and to a thorough discussion of our policy for the future. – F.C. Craighead.

For the remainder of 1923, Miller was headquartered in North Fork but was there only intermittently. He continued his field work on the San Joaquin Project; in May he was on a demonstration trip to the SONC project (fig. 63) near Klamath Falls with Chief of the Forest Service, Colonel Greeley, and in late July and early August he was in the Grand Canyon National Park and the Kaibab Plateau on the north side of the canyon.

An outbreak of the black hills beetle (now mountain pine beetle) north of the Grand Canyon was resulting in the death of thousands of pole-sized ponderosa pine. Miller went to examine the outbreak because the plan of reorganization also placed him in charge of the southwest region. The north rim of the Grand Canyon was very difficult to reach at that time. It meant a long trip over rough roads from Kanab, Utah, or taking the Santa Fe train to Williams, Arizona, then another train to the south rim, horseback or walking down to the Colorado River at Phantom Ranch, then up the trail to Bright Angel and the north rim. Miller chose the latter route. He walked down to the Phantom Ranch where horses awaited to ride to Bright Angel. On the return trip he reversed the mode of transport. He said it was an interesting trip, but he would not care to repeat it.

In the fall he spent time on the SONC project with Keen and Kimball helping to smooth operational problems.

Miller had been a football fan since his student days at Stanford University. The end-of-the-season game between the University of California, Berkeley, and Stanford has always been a big rivalry match called the “Big Game.” On Saturday, November 24, the day of the “Big Game,” his diary notes “went over to the game in p.m.” He had conveniently scheduled a meeting at the Forest Service office in San Francisco the day before. His diaries note attendance at quite a few Big Games.

During the half-dozen years before the reorganization, Burke had been running a one-scientist laboratory at Los Gatos and then at Stanford University as already noted. He had really become isolated from current forest entomology problems at his own choosing. He was doing some

noteworthy research on the biology and control of a number of shade tree and ornamental tree insects, but this kind of work had limited political appeal when bark beetles were killing hundreds of thousands of forest trees in the West. Shade tree entomology had a mostly urban clientele but was not considered "forest entomology" by most forestry professionals. The end of the Shade Tree Entomology Laboratory at Stanford University was on the horizon. The ending two paragraphs of his memoirs are rather sad, but on the other hand, the new organization needed his talents, as Miller well knew. Burke's last entries follow (Burke 1946):

> Several new shade tree insect pests became important and were investigated. Among these were the live oak leaf gall, *Andricus bicornis*, Bakers mealy bug and the Monterey pine sawfly which defoliated numerous trees in the native forests near Monterey. The importance of the work done by the laboratory on shade tree insects is indicated by the fact that the State Highway Department took up pest control for the trees planted along the State highways and selected W.E. Glendinning of the laboratory staff to have charge of the work. This was May 15, 1922. Another member of the staff, R.D. Hartman, was taken by the State Department of Agriculture, December 1, 1923, to head its nursery service.
>
> To carry this story further would be going beyond the first years in forest entomology. During the period that I have covered thus far in this account of my experiences, the Division of Forest Insects was concerned mainly with finding out which were the most important forest insect problems, determining the taxonomy and biologies of the insects concerned, and developing direct methods of control. In later years the trend in forest insect investigations has been to place more emphasis on ecological studies and the control of insects through forest management practices. Since 1923 I believe that the western field laboratories have been larger, better equipped and staffed with more technical men. The story of these developments belongs to another period and since I started out to give my recollections of the first years in forest entomology this seems to be a good point at which to close this autobiographical sketch.

Miller wasted no time getting Burke back into "forest entomology." In October 1923, Burke examined the Lake Arrowhead Project, which was being financed entirely by private property owners, including work on several thousand acres of Forest Service land. Miller felt it was important for Bureau entomologists to give technical aid for such a project, as private funds were being donated to control Jeffrey pine beetle on Forest Service land. Perhaps this was an appropriate first assignment for Burke, as he had first discovered the Jeffrey pine beetle as a new species in Yosemite National Park in 1906. Even though there were some research elements to the project, Burke's feelings about control projects in general were not diminished as evidenced by his November 1923 contribution to the Western Division Newsletter (Burke 1923):

> Are we not putting the cart before the horse in insect control? We are spending a lot of time and money trying to keep the insect away from the tree when we do not know why it is after it. Would it not be more sensible to spend considerable money to find out why the insect attacks the tree in the first place? If we knew just why an insect attacks it might be a simple matter to make a valuable tree non-attractive and a worthless one more attractive. Close cooperation with a good chemist should solve the problem.

This was a very prophetic statement. By the 1960s, entomologists and chemists were studying precisely what he suggested. Research on the chemistry of primary attractants of host trees and insect attractant pheromones, were hot research topics. Advances were made to the point of attracting beetles to certain "trap trees" by using aggregating attractant pheromones just as Burke had suggested almost half a century earlier.

From this point on in the story, there are few documents or memoirs left by Burke. There are some interesting contributions that he made to the Western Division Newsletter until it was discontinued in 1926. His daughters and grandsons also wrote some of their recollections about their father, and those will be used later in the story.

On December 1, Miller and Burke left on the train for Klamath Falls. Enroute, in Weed, California, they met Craighead who had been appointed chief of the Forest Insect Division in April, and Evenden, from a new field station in Coeur d'Alene, Idaho. The next 2 days they showed

J.M. Miller, PSW

Figure 64—Craighead party checking beetle control work, SONC, Bly, Oregon, December 5, 1923. (Left to right) Evenden, Craighead, Keen, Patterson, Burke, Person.

Craighead bark beetle control being carried out by crews of the SONC project near Beatty, Oregon. Unfortunately, according to Miller, they found some trees abandoned by the insects that were being treated, and the burning of western-pine-beetle-infested bark not very thorough. Luckily a big storm arrived before the chief from Washington could see any more poor work, so they high-tailed it to Klamath Falls (fig. 64).

Actually the purpose of Craighead's trip to Oregon was to meet with the Western entomologists and facilitate the new organization of the Forest Insect Division in the West. The only reason he held the meeting in Klamath Falls was that the SONC project was the highest funded project to control forest insects under the auspices of the Bureau of Entomology, so many of the entomologists were working there. And he wanted to see first-hand this important project.

Craighead gathered Miller, Burke, Patterson, Keen, Edmonston, and Evenden (fig. 65) for the next 5 days, and by December 10, the organization was drastically changed.

The changes are best described by Miller who was there (Miller and Keen, n.d.).

> THE REGIONAL FOREST INSECT LABORATORIES.
>
> Up until 1924 the locations for western field stations of the Division had been selected largely from considerations of easy access to areas where control or investigative work was undertaken, and the stations were discontinued or moved whenever it seemed expedient to do so.
>
> With the rapid development of automobile transportation after 1920, it became apparent that the projects with which forest entomologists were concerned could be handled over a wide field from permanent stations centrally located as to regions. Such centralization offered many advantages from the standpoint of research programs, such as the grouping of men near educational centers where library facilities and contacts with other research agencies were available. It also offered the opportunity for the Division to build up well equipped laboratories for its work with the assurance that the installations would be permanent.
>
> In 1923, F.C. Craighead succeeded A.D. Hopkins as Chief of the Division of Forest Insect Investigations. Craighead held conferences in 1923 and 1924 with the men engaged in western pine beetle work and took into consideration the consolidation of a number of the small western field stations that were then being administered. There were then 6 stations working on bark beetle projects located at Coeur d'Alene, Idaho; Klamath Falls and Ashland, Oregon; Stanford University, and North Fork, California; and Tucson, Arizona. At a general conference held at Klamath Falls, Oregon, in December 1923 the decision was reached that all of the stations except the one at Coeur d'Alene would be consolidated and grouped at Stanford University. This would bring together all of the work concerned with the western pine beetle in the Pacific Coast

J.E. Patterson, PSW

Figure 65—Craighead's Klamath Falls conference, December 1923. (Left to right) Burke, Evenden, Keen, Miller, Craighead, Edmonston.

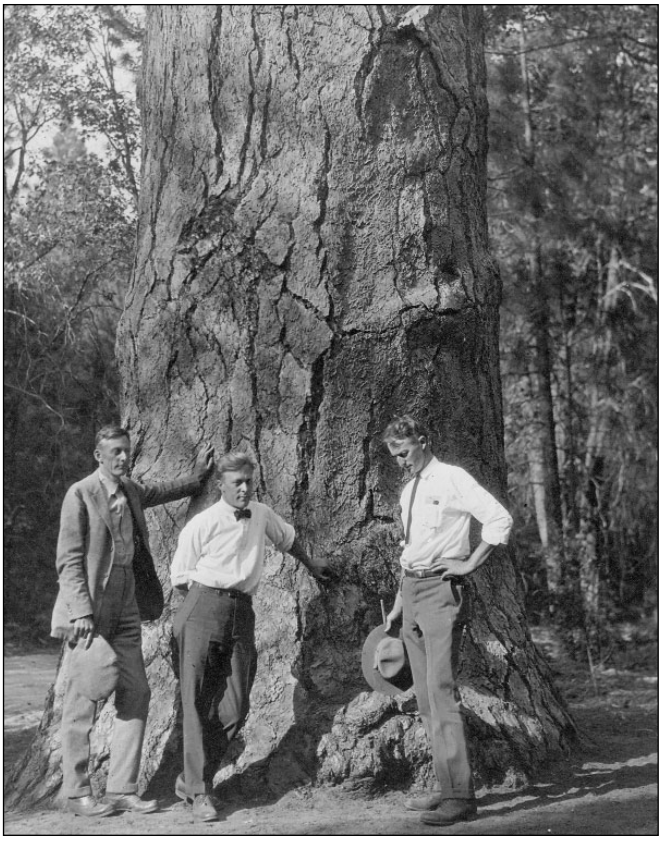
region and Southwest. The Coeur d'Alene station was to be continued and developed as the center of work for the Northern Rocky Mountain region with the mountain pine beetle as the main problem.

This move provided for 2 centers of work of the regional laboratory type for the western pine regions. For practical purposes, the California laboratory provided for the bark beetle work in the territory included by Forest Service Regions 3, 5, and 6; the Coeur d'Alene laboratory for Forest Service Regions 1 and 4. As funds permitted, it was contemplated that more adequate service would be provided by setting up additional laboratories, especially for Regions 3, 4, and 6. The title of Forest Insect Laboratory was not officially adopted by the Division until 1933.

The Forest Insect Laboratory at Stanford University went into effect in December 1924. The consolidation of personnel from the former field stations brought together a staff of approximately 12 technical men, and it was possible to concentrate man-power on the more important leads of research which will be discussed in the following sections. The program of the laboratory included a wide range of problems in forest entomology other than the western pine beetle. It's most important function was the maintenance of technical service work wherever control projects were undertaken by federal, private and state forest agencies throughout the Pacific Coast and Southwestern pine regions.

The year 1924 became a period of transition and moves. Miller was spending less time at North Fork and his family was spending more time at Bessie's family farm—"The Brose Ranch." The attraction of Yosemite continued its hold on Miller. He spent a week there discussing plans for an exhibit of forest insects in the museum, and the use of his lantern slides, and a new pine beetle movie to show summer visitors. The Bureau of Entomology was actively promoting insect control to the public now, especially since Keen found on his trip to Washington that the Assistant Secretary of Agriculture didn't know that bark beetles killed trees. Miller and the park naturalist took some time to photograph the "Giant Yellow Pine," the largest ponderosa pine in Yosemite Valley (fig. 66).

Although Burke was going to be more active on forest entomology problems, the research on shade tree entomology was continuing on a reduced scale. In January 1924, Burke, Miller, and Edmonston took Craighead to visit Monterey pine forests owned by the Del Monte Corporation that were being seriously defoliated by a sawfly. And, as if it were expected of him, Burke wrote a several-page essay on the wisdom of insect control in national parks when it was his turn to contribute the lead article for the Western Division Newsletter (Burke 1924).



J.M. Miller, PSW

Figure 66—At giant yellow pine in Yosemite Valley, California, 1927. (Left to right) H.E. Burke, F.C. Craighead, and J.M. Miller.

One paragraph tells the gist of his feelings:

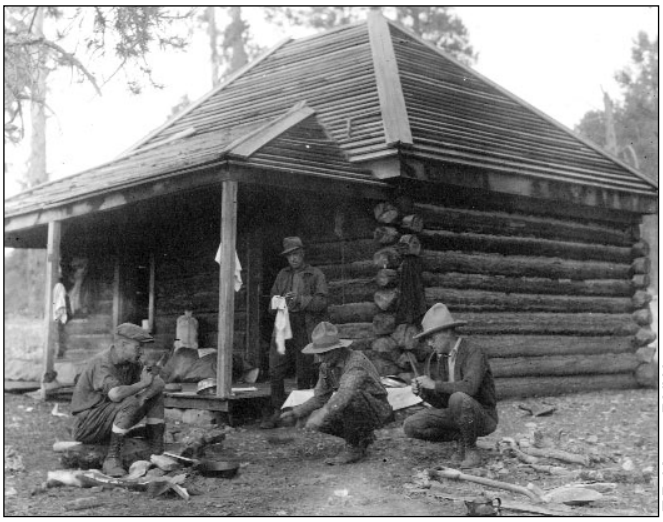
> Insect killed timber is as natural to the primeval forest as are the trees themselves. The first law of nature is ceaseless movement. All is change. Nothing stands still. Trees grow and die from many causes, destructive insects, being one of them. All of this is as nature intended and mere man should be careful how he interferes if he is going to carry out to the fullest extent the purpose for which the parks are created. *Is there any real necessity for controlling insect infestations in the parks?* [Italics added].

Of course, probably as he intended, he stirred up a hornet's nest of replies from entomologists and foresters who made their living killing insects in national forests and national parks. As a matter of fact, Crater Lake National Park had just requested funding a month before to start a control project against the mountain pine beetle, which was killing thousands of lodgepole pine (Wickman 1990).

The far-flung forest insect outbreaks that Miller now had administrative responsibility for included increasing problems in Yellowstone National Park (Furniss and Renken 2003) and a control project in the Kaibab area (fig. 67). Luckily the SONC project was winding down as the timber losses were on a downward trend, and Congress failed to provide funding until late in the year. This meant Keen's presence was not required, and this was lucky for Miller because the only other entomologist available was Patterson who was working on the Antelope Control Project with McCloud River Lumber Company, examining the bark beetle outbreak at Crater Lake, and finishing up his research on the pandora moth.

To top it off, Miller was trying to complete studies on the San Joaquin project, which had drawn him to North Fork several years earlier. This project covered a large area on the Sierra National Forest and was centered in the Chiquita Basin. The objective of the research was to see if continued summer treating of infested trees could supplement and improve the overall effectiveness of the winter/fall normal treatment periods. Summer is a difficult time to locate and treat bark-beetle-infested trees. The beetles are flying and making new attacks, and the needles are green for some months after attack. The only way to identify newly attacked trees was look for "pitch tubes" or resins mixed with the boring dust of beetle attacks exuding from the bark. It takes a very experienced eye to identify these new attacks.

Then a new research opportunity presented itself at North Fork in July. A ranger's house caught fire and resulted in a fire of several thousand acres of ponderosa pine forests. There was much interest at the time of the interrelations of forest fires and insects. Observations by entomologists revealed that bark beetles and wood-boring insects were attracted to scorched trees and trees killed by fire, but there



F.P. Keen, PNW

Figure 67—At cabin in VT Park, Kaibab National Forest, Arizona, 1922. (Left to right) Chief of Division Dr. F.C. Craighead, W.D. Edmonston, George Hofer, F.P. Keen.

was little quantitative information on what degree of scorch resulted in bark beetle attacks, how successful brood survival was in fire-injured trees, and whether beetles emerging from fire-damaged trees would kill green trees nearby. Some work of this nature had been started by Patterson and Miller after the mistletoe burn near Ashland in 1914, but results were inconclusive. Here was a serendipitous event in the back yard of Miller's research station. Even though he was scheduled to relocate to Palo Alto in 6 months, he started a study in the burn and left his assistant Wagner stationed in North Fork to follow up (Miller and Keen 1960). Miller also started a dendrochronology study on the increment growth of various classes of pine trees in the San Joaquin project. Everyone was so busy that summer that Miller suspended the newsletter from August through November.

Burke was helping as needed, but the sawfly infestation near Monterey was so serious that he developed a gasoline-powered sprayer to attempt control measures and undertook some tests of this new approach for forest insects. To complicate matters, the new chief of the Forest Insect Division wanted to get a crash course on Western forest insect problems.

In July 1924, Craighead was back in Oregon meeting with Burke, Miller, and Patterson. Craighead was no stranger to Oregon. In 1913, as a student summer employee of the Forest Insect Division, he made a posttreatment

examination with Sergent of the northeastern Oregon project that Burke supervised (Burke and Wickman 1990).

Now, 11 years later, he was in charge of forest entomology throughout the United States for the Bureau of Entomology, Department of Agriculture. Because California and Oregon had the preponderance of forest insect problems, control appropriations, and funding, Craighead had been getting information on Western forest insect problems from politicians and Forest Service people in those states. In July he also visited the pine forests north of Klamath Falls recently defoliated by pandora moth. After viewing these forests, he went with Patterson and Miller to Crater Lake National Park to meet the Superintendent, Colonel Thompson, and apprise him of the increasing infestation of mountain pine beetle in lodgepole pine mentioned earlier. After discussing the fate of the Ashland station with Patterson (it was to be closed in 1925), Miller and Craighead headed to Yosemite National Park. They met Burke there, and Craighead was taken to areas in the high Sierra where Burke and Miller had carried out the first research and surveys of the lodgepole pine needle miner and mountain pine beetle a decade before (fig. 68).

Craighead probably spent a very pleasant 10 days in the Yosemite high Sierra.

Finally, in the fall, Miller was requested to examine tree killing in the Lake Tahoe area by Nevada State Senator Oddie. Miller found white fir, Jeffrey pine, and lodgepole pine being killed by various bark beetles. He also reported root disease, probably for the first time in that area, to Dr. Meinecke, Forest Pathologist for District 5 of the Forest Service.

Summer turned to fall, Keen's SONC office closed, Sergent resigned at Ashland and was hired by the McCloud River Lumber Company (the loss of a faithful, hard-working assistant), and the demand for insect surveys declined. Miller spent more and more time at Palo Alto. He was there consulting with Burke, the new oldtimer, on the upcoming consolidation of the entire Forest Insect Division staff at Jordan Hall on the Stanford University Campus.

A new era was opening with the New Year. Burke and Miller were working together again in the same office for the first time since 1913.

J.M. Miller, PSW

Figure 68—(Left to right) H.E. Burke, H.L. Person, F.C. Craighead at Tenaya Lake, Yosemite National Park, 1924.

CHAPTER 14: The Forest Insect Division at Stanford University, 1925-1929

The year 1925 brought some lasting changes to the Forest Insect Division Station and to the career of H.E. Burke. As he put it in the newsletter on January 1 (Burke 1925)—"After a year of peace and quiet the Palo Alto Laboratory is in the midst of great confusion and turmoil preparatory to settling down into permanent headquarters for the western work," the great confusion and turmoil was described by Miller in the December 1, 1924, Newsletter—facsimile of page 1 follows:

WESTERN DIVISION NEWS LETTER
Forest Insect Investigations, Bureau of Entomology
U.S. Department of Agriculture
(not for publication)

Palo Alto, California–December 1, 1924.

THE PALO ALTO STATION.

This issue of the News Letter is coincident with the centralizing of the activities of the Western Division of Forest Insects in one central station at Palo Alto, California. A move of this sort has been considered for several years because of the need for correlation of the work throughout the western field. This could only be accomplished by unifying four small field stations in Oregon and California at one point central to the general area to be covered. The stations involved in this move are the ones located at North Fork, California, Palo Alto, California, Ashland, Oregon and Klamath Falls, Oregon.

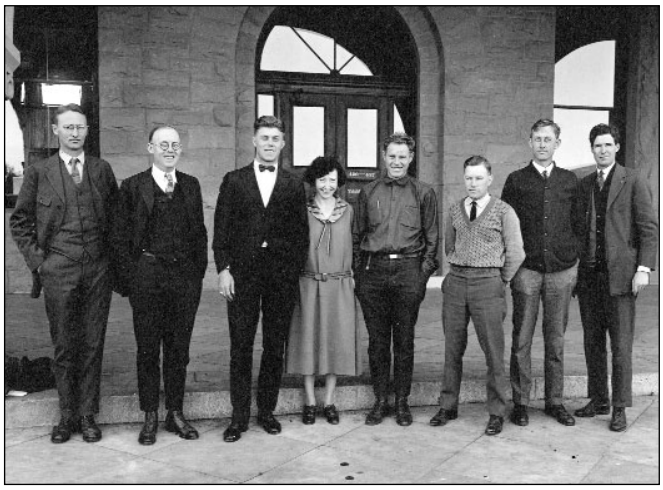
This station is the first effort on the part of the Branch to establish a permanent regional field station with an organized staff and facilities to carry out the various lines of investigation involved by the forest types of the general region. The area which this new station will attempt to serve is represented by Forest Service District 5, the southern half of District 6, District 4 and District 3. Palo Alto is central of the transportation facilities for this territory and is accessible to the District Forester's office at San Francisco. The Department of Entomology of Leland Stanford Jr. University has provided the housing necessary for laboratory and office quarters together with the use of library and other facilities.

Two of the stations affected by this consolidation will be continued as substations to facilitate the handling of special project work. These are the ones located at North Fork and Ashland in connection with the studies of the San Joaquin and Southern Oregon-Northern California project.

The personnel of the Palo Alto Station will be J.M. Miller, Dr. H.E. Burke, F.P. Keen, J.E. Patterson, O.J. Hauge, H.L. Person, Entomologists, E.A. Morrow, Assistant Scientific Aid, and R.M. Tatro, Clerk. Albert Wagner, Senior Scientific Aid, will be located at the North Fork substation during the progress of the studies on the San Joaquin project [fig. 69].

Western News Letter

Beginning with this issue we will plan to get the paper out on the first of each month from the Palo Alto Station. Due to the necessities of the field season, this is the first issue to appear since July 1, 1924. During September the question of whether it would be advisable to renew the News Letter at all was raised and a poll was taken of all the western men and others interested. There was a consensus of opinion that the paper should be kept up as it is the most available medium for this exchange of ideas and record of progress.



PSW

Figure 69—Staff of Pacific Slope Station in front of Jordan Hall, Stanford University, 1926. (Left to right) J.M. Miller, F.P. Keen, O.J. Hauge, Jean Tatro, E.A. Morrow, H.L. Person, H.E. Burke, and J.E. Patterson.

Miller went to Washington, D.C., for most of January to meet with Craighead and various people in the Bureau of Entomology, Forest Service, and Park Service. During his absence, Burke was in charge, so he bore the brunt of organizing the new station for the first month as well as his new responsibility for editing the Western Division Newsletter.

Perhaps all of this turmoil was not especially pleasing to him after spending the last 12 years as a one-man station, but for the science of forest entomology it was very important. Burke was back in the fold again with his colleagues, old and new, as a "forest entomologist." His work as a shade tree entomologist was productive and resulted in new knowledge and publications about his specialty, but the emerging science of Western forest entomology would benefit by his pioneering experiences, academic relations, and maturity, as events would demonstrate. He became the elder statesman of the newly organized station, and the fact that it was located on a university campus where he had contacts with professors and the campus administration must have helped the station get settled rapidly.

The focus of station work now started to shift from a preponderance of technical assistance for control projects with some incidental research to an increased emphasis on research. The technical assistance for control projects would continue because the Forest Service and Park Service needed such work. Their political assistance also helped with appropriations to fund the Forest Insect Division stations. But the entomologists in the station were trying to fit research into their projects to satisfy their own curiosity and to try and get a basic understanding of insect dynamics as they related to timber losses. Their new chief, Craighead, was a strong proponent of this approach.

Miller well understood this when he wrote an essay for the February 1, 1925, Western Division Newsletter titled "Investigations" (Miller 1925). In the first paragraph he wrote:

> The impetus to any research work carried on by a public agency is the result of economic pressure. To a great extent this is true of forest entomology in the United States. The demands of timber land owners for information and scientific service have largely determined the amount of funds available for the entomological work of protection. This pressure has also determined the regional problems to be first considered. The forest entomologist has had little opportunity to choose his path. Lines of research that appealed to his fancy or that in his judgment offered the most promising field for discovery, have been sidetracked for the immediate projects in hand.

He went on to explain the situation in the West.

> In the west, interest has turned largely to the protection of mature pine against bark beetle infestations. This is due to the fact that losses are often severe, that high values are at stake, and that methods of control have been developed which have yielded some measure of success. The requests of owners for information, advice and demonstration of methods has been the first obligation which we have attempted to meet.

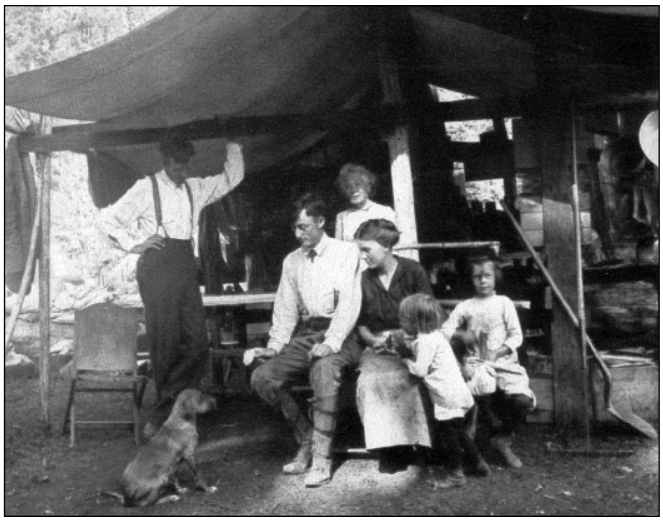
Later in the essay he explains some of the research needs as related to bark beetle problems.

> In the meantime, what about our investigative program? No one realizes better than the man in the field the need for more information and a better conception of the underlying causes of our bark beetle infestations. Such a matter as the ability to forecast the increase or decline of a bark beetle epidemic would have much to do with plans of protection. The tropisms of certain bark beetles, the distance which they fly to reinfest the areas that have been cleaned, the possibility of reducing losses through methods of forest management are some of the studies which have been considered.

This was all very well, but it was focused almost entirely on bark beetles and their depredations of pine forests. Other forest insect problems were becoming important, especially defoliating insects like the pine butterfly and Douglas-fir tussock moth in Idaho that Evenden worked on and the lodgepole pine sawfly and the spruce budworm in Yellowstone National Park (Furniss and Renkin 2003). Within a few decades, pine beetle problems were decreasing in significance in ponderosa pine stands as a spruce beetle outbreak erupted in Colorado in 1949-50. On the heels of this came Westwide spruce budworm outbreaks in fir stands in Oregon, Washington, and Idaho. The move to a University setting was fortuitous because entomology professors like Doane and others to follow became part of the research equation. Burke had already been associated with academia for over a decade, and it showed in his research and broad intellectual curiosity. Having him on the station staff and participating in forest insect research, even if such research continued to emphasize control methods, was a timely stroke of good fortune.

J.M. Miller, PSW

Figure 70—Aerial photo taken by Miller of his study area near Bass Lake, Sierra National Forest, 1925.



H.E. Burke family

Figure 71—The Burke family camp at Yellowstone National Park, 1926.

As the Stanford University years unfolded, there were changes in research emphasis by the station staff and increased participation in professional meetings and societies, but in 1925, a paradigm shift dedicated to increased basic research was still a few years away.

Miller spent most of 1925 dividing his time equally between Stanford University at Palo Alto and his research field station at North Fork where Wagner kept the fire study going. In May he became a pioneer in a new technology to rapidly assess forest insect outbreaks over a wide area. His diary entry for May 26 states, "Left Crissey Field [U.S. Army Airfield at Presidio of San Francisco] flew to North Fork in 1 hour 25 minutes. Return 4:30 p.m."

Lieutenant Taylor of the U.S. Army was the pilot on this historic flight to examine and photograph bark-beetle-killed trees and research plots near North Fork and Bass Lake. Evidently, this was the first aerial photography of insect-killed trees in the West. Several photographs were taken by Miller during the flight (fig. 70) (Miller 1926).

Miller may have been occupied with making the switch of operations from North Fork to Palo Alto, but he still found time to visit his beloved Yosemite National Park and make a hike from Booth Lake, down to Lyell Fork of Tuolumne Meadows checking for lodgepole pine needle miner and mountain pine beetle infestations.

The remainder of the station staff was very busy giving technical control advice to a new customer for their services. The National Park Service received a $25,000 appropriation in 1925 to control forest insects in the Western parks for the first time in their history. As already noted, Patterson was giving technical advice to Crater Lake National Park, which was spending its share of the appropriation combating the mountain pine beetle (Wickman 1990). And Burke, even though he was not a strong proponent of controlling insects in National Parks, was in Yellowstone National Park that summer and the following one studying control methods against a needle tier, and a sawfly defoliating lodgepole pine (Furniss and Renkin 2003). Burke was experimenting with a lead arsenate spray, delivered from trucks loaned by the Eastern Gypsy Moth Division, to kill larvae in the foliage (Burke 1932). Only 250 feet on each side of a road could be treated by this method so the result was purely cosmetic. The objective was to prevent defoliation and perhaps death of trees along scenic roads, not to reduce populations overall. Burke probably saw this as something of a wasted effort, but like a good soldier carried out the project with his usual dedication. The project did allow him to have his family with him for the summer in a beautiful setting that his wife and children enjoyed (fig. 71).

The year 1924 was the driest on record to that date in many localities in the West. This resulted in a very serious fire season. There was much interest by forest managers on the effect of bark beetles, following the fires, killing scorched trees and even nearby green trees.

TRIP TO YELLOWSTONE NATIONAL PARK 1926
by Claire Burke

The Yellowstone trip was another example of her derring-do [Mrs. Burke]. Not one of us would ever forget it or fail to place it foremost in our memories. It was not exactly a wilderness experience, but perhaps more formidable than the High Sierra was good old Highway 66. As I have often heard her say, "Even Dad looked at me as if I were crazy," when she insisted on driving all five kids and the dog in an open [it had a cloth top] Model T Ford nearly 1,000 miles from Palo Alto to West Yellowstone.

We lost various articles of clothing out of the open windows and went over bumps that tossed us to the ceiling as we sped along at a maximum of twenty-five miles per hour. Skimpy, the terrier mix jumped out once to chase a squirrel, but was just dazed for a few minutes and ran to catch up. Mother insists that we were never so well behaved; she kept Marion and Bud up front and Janet, Dorothy and Me in back for sociological reasons. I suppose Marion and Bud were a little too close to headquarters to get anything going between them. In hotels, we often had two double beds and the interrelationships were again carefully thought out.

Skimpy drove the whole way with hind feet on knees in the back seat and forepaws near Mother's shoulder. His face was always in the rear view mirror. He would drop exhausted whenever the car stopped, but immediately resume his post when the engine started.

The car was fantastic. Mother seemed to understand its every sound. After all, it was HER car. It bothered Harold [Claire's future husband] when we first met that the family car was always referred to as 'Mother's car', but every car we had as a family car replaced the first one which was a gift to my Mother on her birthday. Dad did eventually get a Model T long before they became fashionable to commute to work because he was never able to master the shift. Even in the Model T, he was apt to start out like a jack rabbit. But Mother and cars were made for each other.

It was not very far out of Wells, Nevada, when Mother discerned a strange sound in the engine. "Something is wrong with the timer"; so we turned back and got a new timer. I have always been

H.E. Burke family

Mrs. Burke and her birthday Model T Ford on the way to Lake Tahoe from Placerville, "my first long drive" (date unknown).

impressed with her sensitivity and understanding of cars. She and Marion could both change tires. Our horn failed but I provided a stentorious imitation of one of those musical horns on the outside of very expensive cars. It was gratifying to see the car ahead rapidly pull out of the way and the occupants stare in amazement as we hurried by. Our light weight and our ruxtle axle, something very special that Mother had put on our car, carried us through mire where many Buicks and such were hopelessly stuck. As we passed triumphantly, we would lean out and yell, "Get a Ford".

It was a happy moment when we entered the line up to go through the gate into the park. For miles we had been in a long chain of cars in two ruts in deep gravel. There was nothing to do but follow no stopping, no passing. One of the Rangers at the gate recognized us way back in the line and made the cars move a little to let us out. We were trying to hide Skimpy under a blanket as we were aware of the no-dog law in the park. We had permission to bring him because we would be at a ranger station far from the tourists, but we weren't sure that this Ranger would understand.

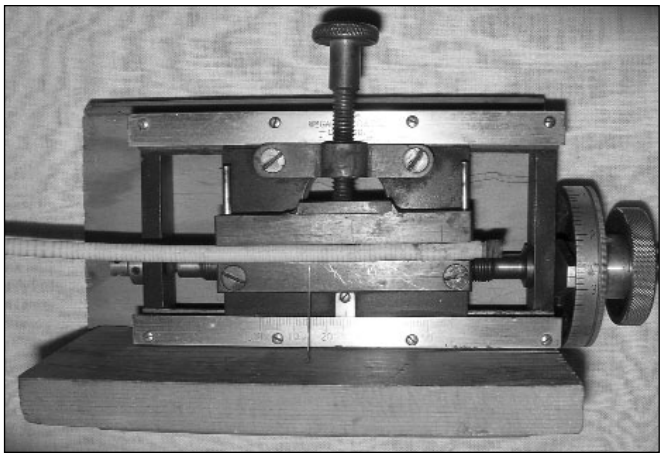
"Will your Dad be glad to see you!" he said, and waved us through the gate reserved for buses and other park vehicles. From that moment on, we owned Yellowstone." —Claire Burke (date unknown).

As mentioned earlier, a 6,000-acre blaze was started adjacent to the North Fork station when a ranger residence caught fire. This fire was in mature ponderosa pine and Miller immediately established study plots in the burned area to study the entomological relations. This research led to some important publications to be reported later.

Keen and Edmonston spent the summer of 1925 on the Kaibab Plateau continuing to help with the Black Hills beetle outbreak. They even had a local character called "Windy Jim" [Jim Henry] build a laboratory-insectory for them out of beetle-killed lumber sawn at a local mill. Professor Blackman, on leave from New York State College of Forestry, used the facilities to carry out biological studies.

Patterson, besides his work at Crater Lake, was also cruising the SONC project and finishing up his research on the pandora moth in south-central Oregon (Patterson 1929). Patterson was also using increment cores to study the effects of defoliation by pandora moth on tree growth and the relation of growth rate of ponderosa pine to susceptibility of attack by bark beetles. This was the beginning of studies that resulted in a breakthrough in the silvicultural management of western pine beetles. It was also indicative of the new dedication of at least some of the stations in aiming resources at basic research. As pointed out in the previous chapter, in the May 1925 Western Division News Letter, Burke wrote a prophetic short essay on the need of an attractant for western pine beetle. He asked, "Why do beetles attack one tree and not an identical one nearby?" This was a fundamental question that research by Hubert Person was starting to elucidate. Person was a young forester who had just joined the staff at the Stanford Laboratory. His research assignment was studying host (pine) susceptibility to bark beetle attack.

On a less enlightened note, the station hired the first female entomologist in June, 1925. Therese Beckwith, formerly a clerk at the Entomology Department of Oregon Agricultural College [Oregon State University], passed the civil examination for Junior Entomologist. But she was hired at the station as a temporary *office clerk*. Times were changing, but not that fast. She resigned a few months later, I hope to pursue a more professionally fulfilling career.



B.E. Wickman

Figure 72—Patterson's original increment core micrometer, which I still use.

The year ended at Palo Alto with Burke back at his newsletter editor duties, Miller and family in a new residence in Palo Alto, and Patterson, Keen, Person, and Walter Buckhorn (a scientific aide) filling out the staff. Hauge had resigned in November and moved back to Klamath Falls.

Measuring the radial growth of trees by using increment cores taken at breast height was in vogue. Almost all of the entomologists were making these measurements to either determine the effect of insect attacks on the trees (Patterson studying pandora moth and Burke the lodgepole needle miner), while Person, Miller, and Keen studied the relations of tree growth rate on susceptibility to beetle attack. Person alone measured over 7,000 cores in 1925 and early 1926. Measuring growth rings to about 1/100th of an inch was tedious and exacting work requiring a microscope and steady hands. Patterson devised a micrometer sliding stage that he called an "increment core comparator" (fig. 72) (Patterson 1926).

This device improved the efficiency and accuracy of measuring increment cores, and for the next decade many thousands of mature pine trees were cored and measured to determine the cryptic patterns of their growth rates.

In March 1926, the Western Division News Letter's masthead changed to "Western Forest Insect News." The subscription had swollen from only a dozen or so copies to over 100. The newsletter was increasingly calling the Palo Alto headquarters a laboratory and the other locations field stations.

In June, Miller lost his trusted field aid, Earl Morrow who transferred to the Sierra National Forest. Also, that month, the field season officially began with Burke and family going to Yellowstone National Park and Miller traveling to all of the field sites with Craighead who was making his annual field visits from Washington, D.C. He differed from Hopkins in this regard, perhaps because rail travel was improving; he visited all of the field stations at least annually and sometimes twice a year. Burke's daughter Janet, remembered one such visit to Yellowstone Park as starting with a not-too-pleased discussion of his impending visit by her parents.[1] When he arrived she distinctly remembered his wrinkled seersucker suit; he was probably disheveled from a long, hot train journey. Being a child, she did not understand this, but thought it was strange apparel for a Yellowstone Park campfire. The Burkes had quite a few VIP visitors that summer, including the Assistant Secretary of Agriculture, R.W. Dunlap.

Miller continued his annual trips to Yosemite and the Mono Lake area where extensive wind-thrown Jeffrey pine had become infested with Jeffrey pine beetle. By 1926 there was a large infestation of this insect in the area, but by 1927 it had greatly subsided. Because of the diversity of timber types and climates between the west side of the Sierra and Cascade Mountain ranges and the east side, there was never a shortage of forest insect problems to show to Craighead. Miller took full advantage of these outbreaks to propagandize the diverse problems and the station's need for more funding. Miller seemed to be a very astute leader who could discern and understand not only the research needs, but also how to publicize them and politick the right people. Under his leadership, the Forest Insect Station steadily grew in personnel and importance.

The next entomologist hired by Miller was George R. Struble, a senior entomology student at Stanford University hired to be a part-time worker at the station headquarters in Jordan Hall. Struble describes his first introduction to the station (Struble 1953):

> I was introduced to forest entomology at Stanford University in the fall of 1926, as a senior student in biology and zoology. I had taken several courses in entomology under Professors R.W. Doane, G.F. Ferris, and Isabel McCracken and decided that a career in economic entomology might be worth while. These courses were given in Jordan Hall, which housed the School of Zoology. At this location also was the Pacific Slope Laboratory of Forest Insect Investigations, U.S. Department of Agriculture, Bureau of Entomology. This laboratory was the headquarters station for forest entomological research and surveys covering the Pacific Coast States, Arizona and New Mexico.
>
> A tour of the laboratory by a group of entomology students had been arranged between Entomologist John M. Miller, in charge, and Professor Doane. The long trek by stairs led from a small headquarters office on the ground floor upward four floors into an attic section of Jordan Hall. An expanse of skylighted corridor lined by rearing cages of various designs led into a large, darkly paneled room at the north end. Some were for Dr. Isabel McCracken's studies of silkworms. Many were used in studies of forest Cerambycid larvae by Dr. H.E. Burke, a leading forest entomologist. Burke had been associated since 1901 [sic] with Dr. A.D. Hopkins, pioneer chief of forest insect investigations in America.
>
> The laboratory room was about 20 feet wide by about 40 feet long. It was lighted by a center light well and heated by a single steam radiator. Housed here were the forest insect collection, desks, files, and personnel. Two side doors led to large areas of unfinished attic space which were used mostly for storing field equipment and various tools. A section at one end was equipped and used as a photographic darkroom [something Miller always insisted on having].
>
> Our tour guides included Walter J. Buckhorn, Hubert L. Person, and John E. Patterson; others of the "bug" staff included Paul Keen and W.D. Edmundson. I was impressed by the many kinds of bark beetles in western forests and their damage. This was my first awareness of the western pine beetle.

Struble failed to mention Dr. Blackman who was writing up his biological studies of the Black Hills beetle from the Kaibab Plateau project before returning to New York.

Miller and Keen were also in a small competitive endeavor over the use of "Aeroplanes" to survey and photograph insect infestations. As noted earlier, Miller was the

[1] Correspondence from Janet Burke Eglington, 2002-2003.

first to get into the air and observe and take several photographs of bark-beetle-killed trees at Bass Lake near North Fork, California, but Keen was the first to actually experiment with aerial photography as a survey method to map an outbreak. His description of the adventure on the Modoc National Forest was written up in the Western Forest Insect News, titled, "Shooting Bugs from the Air" (Keen 1927).

> In September I had the opportunity of making such a flight over the Happy Camp District of the Modoc National Forest. The District 5 air-patrol plane, piloted by Captain M.S. Boggs, was detailed to the project through the courtesy of the Forest Service, and to the Forest Supervisor, George W. Lyons, was allotted the task of serving as weather prophet and to advise Mather Field when air and light conditions would be satisfactory for the flight.
>
> Monday, the twenty-sixth, dawned bright and clear, and Supervisor Lyons, trusting to his luck as an amateur Father Ricard, telephoned the field for the plane to come on. In the next two hours, while I negotiated forty miles of mountain road from camp to Alturas, the plane covered the two hundred miles from Sacramento to Alturas and landed on the field only a few minutes after me. Following a hasty lunch we donned helmets and goggles, strapped on the "chutes," wound up the DH-4, and in a moment Captain Boggs had it climbing skyward, like a *Chalcophora* [a wood boring beetle] scared from a bug tree, and heading toward Happy Camp Mountain.
>
> On reaching the area we circled Happy Camp lookout tower and headed toward Timber Mountain. When over the plots to be photographed I unbuckled the safety belt, knelt on the seat and hung out over the side of the fuselage in preparation to shoot at the proper moment. Captain Boggs maneuvered the plane over the plot and at a given signal shut off the motor, turned the nose up, tilted the plane to the side (a most disconcerting procedure), and as the plane settled and the vibration of the propeller ceased I clicked the camera and climbed back to safety to change plates and prepare for the next shot. After taking a dozen exposures, both vertical and oblique, we headed back to Alturas and landed safely at the field, after spending an hour and a half in the air and covering an area that would have taken a week to survey on the ground.
>
> The first day we used a "G" filter with ordinary panchromatic plates, but upon developing them found that the negatives were too weak for light conditions that prevailed on the area. You see, the Supervisor was almost as good a prophet as a Native Son, and so it started to cloud up by noon and was quite overcast by four o'clock.
>
> And the next day it rained.

Keen's exciting flight must have cooled Miller's ardor to be a pioneer in aerial photography of forests for there are no further references to this activity in his diaries, but he did take a last flight over some of his study areas just before he retired.

February 8-16, 1927, there was a meeting of all Western forest entomologists in the United States at the Palo Alto Station. J.M. Swaine, in charge of Western Forest Entomology in Canada, had suggested the year before in the Western Insect News that such a meeting be scheduled for 1927. However, no Canadian entomologists were included in the list of Burke, Evenden, Jaenicke, Miller, Blackman, Keen, Patterson, Person, and Craighead from the Washington office. Either the Canadians experienced some difficulty arranging the visit or they were not invited. For several years, Evenden and sometimes Keen had been attending the annual Western Forestry and Conservation Association meetings that were joint U.S. and Canadian. A forest entomologist from each country was invited to give an update on Western forest insect problems at every session of the association. As these "insect" sessions became more popular there was some interest in expanding the entomology portion to a full-day meeting. Swaine was most likely thinking of this when he proposed a meeting of forest entomologists only. The joint meeting never seemed to pan out, so entomologists from Canada and the United States continued to meet for brief sessions at the Western Forestry and Conservation Association annual meeting for another 20 years. In 1949, entomologists from both countries split off from the association meetings and formed their group called the Western Forest Insect Work Conference which is going strong today.

The meeting in Palo Alto was a lengthy one, 10 days, so it probably included a lot of bureaucratic chaff along with the technical wheat. In 1927, Miller's diary mentioned an ever-increasing number of trips to Berkeley without

mentioning why or precisely where. They were too numerous to involve only football and baseball games between Stanford and the University of California. Changes were on the horizon again for the Forest Insect Division, Pacific Slope Station. As recounted by Eaton (1953):

> The original proposal to locate at the University of California the forest insect investigative work of the then Bureau of Entomology's Pacific Slope Field Station at Stanford University was made by Walter Mulford, (Professor of Forestry) in a letter to J.M. Miller, dated April 15, 1927. Mulford suggested that this work be located with associated forest research being brought together on the Berkeley campus. Miller favored the proposal (letter to Craighead, April 22, 1927), and F.C. Craighead (then in charge of the Division's Washington office) fully approved (letter to Miller, May 9, 1927).

Miller must have had mixed emotions about this proposed move, because his family had their first permanent residence in Palo Alto where their son Harold (Dusty) was in high school and daughter Betty in grade school. However, Miller probably saw that the future of forest entomology lay with the newly established Forest Experiment Station and the Forestry School, both located on the University Campus at Berkeley. Before the San Francisco Bay Bridge was built, it was a shorter trip from Palo Alto to the Forest Service District 5 office in San Francisco, but the science of entomology and forestry lay in a different direction, across the Bay in Berkeley.

Miller wasted no time in establishing political ties with the Berkeley people. The December 1, 1927, Newsletter noted an important first step.

> FOREST ENTOMOLOGIST ASSIGNED TO CALIFORNIA EXPERIMENT STATION
>
> Assistant Entomologist H.L. Person took up quarters with the California Experiment Station at Berkeley [now Pacific Southwest Research Station] on November 1. Mr. Person's assignment will provide for an important phase of coordination of work between the Bureau of Entomology Station at Palo Alto and the California Experiment Station of the Forest Service. The greater part of Person's time will be given to entomological studies in which the Experiment Station is immediately interested. The Experiment Station has provided funds for a temporary assistant to work with Person in the compilation of the results of the western pine beetle tree selection studies. George R. Struble, who worked with Person last season, has been appointed to take up the assistant work in January.

What Person felt about this move is unknown. He had just recently married and according to Struble, his assistant, the couple was a popular part of the station (Struble 1953). Several months after the transfer, Person had an essay in the Western Forest Insect News that seemed critical of the research of his erstwhile colleagues at the station (Person 1928) (fig. 73).

> The selection of an 80-acre sample plot in 1926 and the addition of two 40-acre plots in 1927 may be taken as one mark of the change in the nature of forest insect investigations that has taken place within a short space of time. Much of the cream of discovery has been skimmed off the field of forest entomology, and the day of short-time studies on a great variety of insects, and of promiscuous wanderings through the forests for the taking of notes on life histories and habits of miscellaneous insects, has largely passed for the scientific investigator. There is still much to be gained by this type of study, but by most of us it will have to be followed as side line or as a form of recreation. The more evident habits and points in the life histories of our most injurious forest insects are known. What is most needed now is a knowledge of the fundamental relationships that result in increases or decreases in the loss from insects.

He presented a summary of his research to date, which was unique and proving valuable, and made a case for the use of permanent plots for this type of research. However, he seemed to forget that Miller, Patterson, and Keen had been using long-term permanent plots since 1914 and that his Cascadel plot was actually one of Miller's long-term study plots that was graciously offered for Person's use.

Miller and the others must have been at least mildly stung by this young scientist's assessment of forest insect research. Miller took exactly 30 days to reply, but he did it in his usual thoughtful way, without getting personal. The reply explains the need to remember the insect in the developing science of forest entomology in this era so well that it is worth including the entire essay (Miller 1928).

PSW

Figure 73—Field party at Mt. Hamilton, California, 1928. (Left to right) H.L. Person, W.J. Buckhorn, F.P. Keen, J.C. Evenden, J.M. Miller, H.E. Burke.

An Informal Letter of
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
FOREST INSECT INVESTIGATIONS
(not for publication)

423 Jordan Hall, Stanford University, California,
March 1, 1928

FOREST ENTOMOLOGY STILL ENTOMOLOGY
By J.M. Miller

In Person's article in the February issue of this paper he very appropriately introduces the change in emphasis that has come about in our line of attack upon certain problems in Forest Entomology. Instead of devoting our entire attention to finding out what the insects are, how they live and what they do, we are concerned as well with the way in which they fit into the scheme of things in the forest. Through the large sample plot and with various types of surveys we are trying to determine the type of forest and other environmental conditions that are favorable or unfavorable to the beetles. The tree rather than the insect becomes the basis of our attack on the problem.

The shift of perspective, in which entomology becomes primarily a phase of forestry, now offers the most promising developments in the solution of our more important bark beetle's problems. But there is an obvious danger in carrying this line of approach to an extreme. First of all we are still entomologists, and a sound knowledge of the insects, their life histories, distribution and ecology is the first consideration in this science. It is in the application of this information that the title of "forest" entomologist becomes significant.

The purpose of these comments is not to start a discussion of "Why is a Forest Entomologist?" but to emphasize to the field man the necessity of keeping up the systematic collections and note records that figured so prominently in the early work of the Division of Forest Insects. I know that on control projects, and even on our sample plot and brood study work, we are prone to let this activity go by the board. This is largely due to the pressure of recording an immense amount of survey data, and to the fact that the need for insect collections and notes is not obvious at the time. The real advantages of gathering this material usually come later, when we want to check up on some particular point in the study and refer to the note or the original material if necessary.

The 'Hopk. U.S.' numbered note system, planned by Dr. Hopkins in the early days of the Division, has stood the test of considerable neglect, abuse and flagrant liberties on the part of the field men. It is still possible by this system, even though the notes have been poorly kept, to obtain any worth while information regarding any particular insect in any locality that has been recorded in the system. All the information so kept can be adequately indexed, summarized and made available to any other worker in the group. Such references are really indispensable to the field station files.

The most glaring violations of this system are where field men do not collect at all, or else take a large series of the insects connected with some particular study but fail to enter these or the appropriate data in the numbered note series. The information so recorded is available only to the collector himself, and in time will probably be lost even to him.

Although on some projects it seems best to work with the tools and methods of the forester, it is still part of our job to maintain an orderly accumulation of information about the insects that concern our problems. In doing so let's stick to the system we now have until a better one has been devised and adopted.[2]

[2] The Hopkins U.S. numbered note system for collected forest insects was recently computerized by the Forest Service Washington office led by retired entomologists Mel McKnight and Torolf Torgersen, thus vindicating Miller's faith in the importance of the system. The system can be found at http://www.fs.fed.us/pnw/bmnri/hussi1.html.

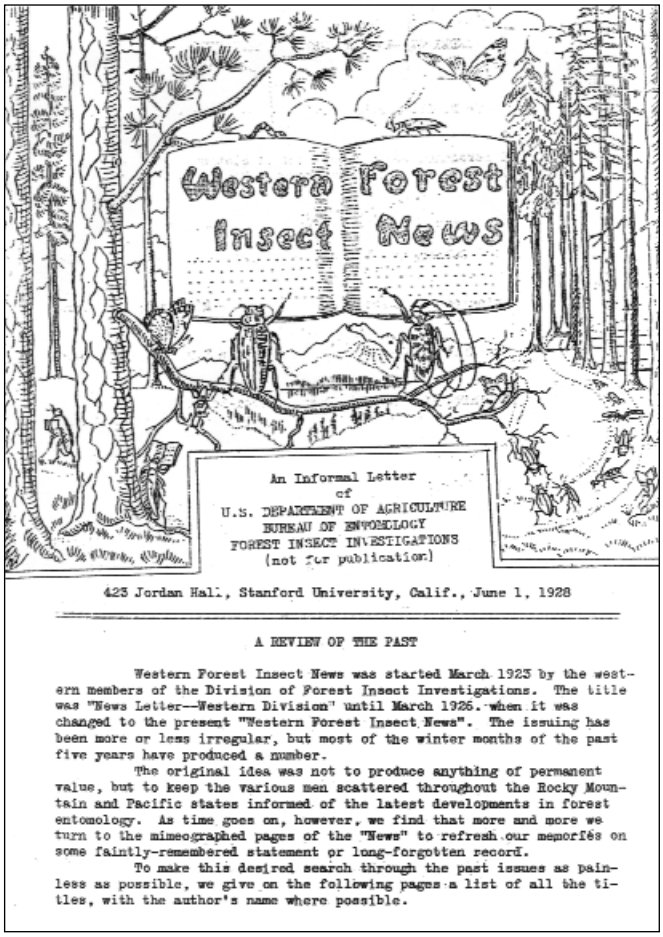


Figure 74—Cover of the Western Forest Insect News showing Mrs. Bushey's artwork.

The June 1, 1928, issue of the Western Forest Insect News was its last. It contained an index of all previous issues and a list of subscribers. There were 132 people and organizations receiving copies at no charge. There was no reason given for its demise, but Burke, the editor, must have been sorely pressed to assemble the monthly news and get it mailed out on time even though he had some good clerical assistance in Mrs. Bushey, who even did the artwork (fig. 74).

Burke was very involved in preparing reports on his control work in Yellowstone and Glacier National Parks for a conference held in Berkeley in 1928. There were apparently no volunteer editors forthcoming, so a valuable historical newsletter ceased publication.

The plans for moving to Berkeley were progressing in 1929 even as the station staff went about their duties in the field (Eaton 1953).

> In a letter to Mulford dated April 9, 1929, Miller described the amount and kind of space that would be needed for forest insect investigations if the Palo Alto station were to move to Berkeley. In reply (April 17, 1929) Mulford stated that the University was committed to the plan of having all or nearly all of the forest insect group housed in Giannini Hall at Berkeley; that C.B. Hutchison (then Dean, College of Agriculture) approved of arrangements planned; and (in effect) that most of the needs of the forest insect group could be met.

The Pacific Slope Station was about to take the most significant leap to date by moving to Berkeley. Continual change seemed to be part of the Station's role since its inception. Organizations are always changing in different ways, but the changes occurring in forest insect research seemed to be extraordinary in such a short period from 1910 to 1930.

CHAPTER 15: The 1930s–A Momentous Decade for the Forest Insect Division

The decade beginning in 1930 was an extraordinary period for the Division of Forest Insect Investigations on the Pacific slope. Some of the more significant changes that affected Burke and Miller included the relocation of the Palo Alto lab from Stanford to the University of California at Berkeley; creation of a new Forest Insect Laboratory at Portland, Oregon; establishment of the first permanent Forest Insect Field Stations in California; many personnel changes; an extreme drought in the West that greatly exacerbated bark beetle problems; the first aerial control operation against a defoliator; and, one of the most notorious forest fires in the Pacific Northwest, with attendant insect problems.

In this chapter, the professional careers and personal lives of both Burke and Miller are tied directly or indirectly to the unfolding events of the period.

The relocation of the Palo Alto lab to the University of California School of Forestry influenced many of the coming changes. Miller described the move in a very sparse paragraph (Miller and Keen, n.d.):

> In September 1930 the California laboratory was moved from Stanford to the University of California campus at Berkeley into laboratory and office quarters provided by the School of Forestry. This move established close contact of the research work with the Forest Experiment Station of the Forest Service, the School of Forestry and Entomology Division of the College of Agriculture.

Luckily Eaton prepared a summary of the move that provided a little more detail, as first noted in the previous chapter (Eaton 1953).

> Formal invitation for the Forest Insect Laboratory to move to Berkeley was made by R.G. Sproul (President of the University) in a letter to F.C. Craighead dated July 2, No commitments were made regarding what the University would provide; simply that the University would be glad to have the Forest Insect Laboratory establish permanent office and laboratory headquarters with the University of California at Berkeley. This invitation seems to have been acknowledged at the Division and Bureau levels in Washington (no copies in the Berkeley file). Craighead wrote Mulford on October 10, 1930, thanking him for his efforts in behalf of the laboratory. The decision was to accept the invitation, and the move to Berkeley was made during the last week of September, 1930. Recommendations on assignment of rooms in Giannini Hall for forest insect work were made by Mulford to Hutchinson in a letter dated October 14, 1930.

It appears that no formal agreement was drawn up specifying the conditions under which the Forest Insect Laboratory would occupy space at Berkeley. Allusions to the need for an agreement were made in correspondence between Craighead and Miller in the spring of 1930, but apparently no definite action was taken. In a letter to Craighead dated April 4, 1930, Miller makes the following comment: "Apparently a formal agreement would have to be renewed from year to year, and for that reason would not have any great advantage over an informal understanding."

The logic of this relocation had been developing for several years and was evidenced by Person's and Struble's detail to the Forest Service Experiment Station in 1928. During summer and fall of 1930, various Forest Insect Division staff members made the move to six rooms on the top floor of Giannini Hall on the University of California Campus. And as related by Struble, the attic area was used for storage, and by the mid-1930s three additional offices were acquired, one of them outfitted as a photographic darkroom (Struble 1953).

This move was affected by some personal hardships for Miller, whose family did not move their home to Berkeley. Palo Alto was the only permanent home the Miller family had experienced. There were probably some serious family conferences about this, but Bess stood firm. There was reluctance on the part of Miller to give up this residence. Consequently, Miller found bachelor quarters in Berkeley and commuted to his home across the bay on weekends. As Miller had no small children at home and he traveled a great deal anyway, he probably viewed the situation as a temporary inconvenience.

Burke's case was somewhat different. In February 1930, shade tree investigations were made a special project, and Burke was assigned to work in a laboratory at Palo Alto. Then in 1932, his shade tree lab was transferred to

the division of Fruit and Shade Tree Investigations. Burke describes the new assignment as follows (Burke, n.d.):

> January 1, 1932 Shade Tree insects investigations was transferred from the division of Forest Insects to the division of Fruit and Shade Tree Insects. The work continued as before. Special attention was given to the bark beetles infesting the Monterey cypress and the Monterey pine. A number of experiments with various materials were conducted to determine the best methods of preventing attacks by cypress bark beetles on the twigs of living trees. It was found that sprays of lime sulfur and arsenate of lead give the best results.

How this new assignment was arranged through Miller and Craighead is not known, but to the great loss of forest entomology, Burke left the Division of Forest Insect Investigations for good this time. By this time, Burke had such strong ties to the Palo Alto area that it is doubtful he would have sold his home and moved his family to Berkeley or even commuted on weekends like Miller.

The forest insect problems in Oregon were becoming increasingly acute. Ever since the SONC project near Klamath Falls, Keen had been spending the majority of his time in Oregon. For several years Kimball, head of the Klamath Forest Protection Association, along with other private forest interests, the Forest Service, and State Forester Elliot, had been lobbying to have a permanent Forest Insect Division Laboratory in Oregon. Through the influence of Oregon's Senator McNary, a $15,000 appropriation was secured to establish such a lab in Portland, Oregon (Maunder 1974). In 1930, Thornton T. Munger, the first director of the Forest Service Pacific Northwest Experiment Station, helped Keen obtain quarters with his organization in the Lewis building in Portland. Keen was appointed head of the lab by Craighead, and moved there from Palo Alto with his scientific aid, Buckhorn.

This new lab relieved Miller of much responsibility, but it also deprived the new Berkeley lab of the entomologist most knowledgeable concerning bark beetles. In addition, Patterson decided to resign from the Bureau of Entomology and go into a family business building and operating a resort hotel at Pinehurst, Oregon (Wickman 1987). This also dashed any hope Keen may have had for Patterson to be assigned to his Portland lab. (Patterson was still commuting between Ashland, Oregon, and Palo Alto on weekends and was still in charge of the Crater Lake National Park Mountain Pine Beetle project during the summer.) Miller's description of the Portland laboratory follows (Miller and Keen, n.d.):

> The need for a separate laboratory to conduct control surveys and investigations in Region 6 had been realized for some years prior to 1930.
>
> The Western Forestry and Conservation Association, representing both the owners of Douglas-fir and pine timber throughout the west was active in enlisting support for such a project. The entire eastside pine belt of Oregon and Washington had been sustaining high losses of timber resources from beetle infestations and both private and federal owners were vitally interested in seeing an adequate survey and research program undertaken. As a result of this support, a substantial increase in the appropriation for the Division was secured for the fiscal year 1931 and the decision was reached to apply this to a new laboratory to be established at Portland, Oregon, to serve the territory of Oregon and Washington. F.P. Keen was selected to take charge of this new laboratory.
>
> The most important phase of the program of the Portland laboratory was the western pine beetle survey and research for the eastside pine type extending from southern Oregon to northern Washington. This was carried on with the cooperation and financial support of the Forest Service, Indian Service and private owners. Problems of defoliation and fire injury in the Douglas-fir region developed, however, soon after the laboratory was established and have absorbed a considerable part of the attention of this laboratory.

In the 1930s, there were two historic phenomena taking place: the "Great Depression," which was human-caused, the other, the greatest Western drought ever recorded to that point. The Depression brought drastic decreases in appropriations and personnel levels in government agencies. The drought affected tree health, and bark beetle problems were rapidly increasing.

Alas, Burke's Division of Fruit and Shade Tree Investigations was also affected by budget reductions. Even though part of his assignment included forest insect problems in

recreation areas such as national parks and he was still doing some consulting in Yosemite National Park in 1932, shade tree entomology was on the chopping block. As Burke put it (Burke, n.d.):

> Due to lack of appropriations for shade tree insect investigations, the laboratory at Palo Alto was closed June 30, 1934 and Burke retired from Government Service. His youthful ambition was still realized, however, since every month he received a government check for $100.00 minus $3.50 for retirement.

After retirement, Burke was for some time a consulting entomologist for Freeman-Meyers Co., arborists of Santa Barbara. He was also a member of FAX Service, a consulting company on termites, fungi, and other pests of timber products and buildings.

Southern California and city life, however, did not appeal to Burke, and as soon as he could, he moved to a small acreage near Los Gatos to enjoy the simple life.

Family lore has it that Burke was not really keen on retiring, in fact, he was somewhat depressed for a while, worrying his wife.[1] He was still active in entomology giving talks to garden clubs and other organizations. In 1936, the American Forestry textbook series published *Forest Insects* by Doane and several authors, including Burke (Doane et al. 1936). He was the only experienced forest entomologist of the four authors, although Miller and Keen both made large contributions to the book and were originally to be coauthors. A misunderstanding about federal regulations and private book publishing caused Miller and Keen to drop their share of the authorship (Maunder 1974).

One can't help but wonder what additional contributions Burke would have made to the science of forest entomology if he had moved with the others to Berkeley. On the other hand, although he never shirked his responsibilities and willingly shared his knowledge, he sometimes seemed to be a reluctant part of the Forest Insect Laboratory. Some of that can possibly be attributed to Hopkins' iron-fisted control of his field entomologists during the northeastern Oregon and Craggy Mountain control projects in 1910-13. It was not until late 1913 that Hopkins loosened his control of field operations enough that entomologists like Miller could run their own projects.

The economic impact of the Depression had a severe effect on Patterson. He had resigned to run the new family hotel enterprise just as the economic downturn began. The Pinehurst Inn suffered the fate of many resorts during the Great Depression. It was closed in 1933 before all the upstairs guestrooms were completed, and the main building burned to the ground a few years later.

Patterson returned to the Pacific Slope Forest Insect Laboratory at Berkeley in early 1934 and was put in charge of a Works Progress Administration (WPA) project to document, with photographs and drawings, research and control activities on the western pine beetle. He also provided technical leadership on bark beetle control projects carried out by one of the first Civilian Conservation Corps (CCC) camps in the Sierra Nevada of California (Wickman 1987).

The reason he did not go to the new Portland laboratory was probably related to the level of funding the new lab had at that time because Patterson still maintained his permanent residence in Ashland, Oregon. He became a weekend commuter with Miller and, in fact, the two shared various bachelor quarters for many years. When I first met him in August 1948, he was using a cot in his office in Giannini Hall as his sometimes quarters. Patterson was welcomed back by Miller; several, new young entomologists were beginning their careers in the Berkeley lab, so Miller and Patterson were now the only "old hands."

With the departure of Keen to head the Portland lab, Craighead hired Ken Salman, a recent Ph.D. from Massachusetts A&M, to replace Keen at the Berkeley lab. According to Keen, this appointment was made without Miller's input or knowledge and related to Craighead's desire to move more Eastern entomologists to the West (Maunder 1974). Salman's assignment was to be in charge of the newly developed regional program of insect surveys and control in California. His research project was a continuation of the tree susceptibility classification that Keen had started. This was to cause some competitive relations with Keen, as two different tree classifications were ultimately researched, tested, and published by Keen and Salman

[1] Personal communication from Janet Burke Eglington (daughter), 2002.

(Keen 1936, 1943; Salman and Bongberg 1942). Keen's research on tree classification continued in Oregon and was called the "Keen Ponderosa Pine Tree Classification." The Salman-Bongberg approach was called the "California Pine Risk-Rating System." Both systems evolved from research on tree susceptibility to bark beetle attack that had been conducted in the 1920s by Miller, Keen, Patterson, Person, and Struble. Tree growth rates were a particularly important area of the studies, with Miller and Person proposing that slower growing mature ponderosa pine were more susceptible to attack by the western pine beetle than younger more vigorous trees (Smith et al. 1981).

The rating systems resulted in a silvicultural approach to managing the western pine beetle instead of the direct control method of felling infested trees, then peeling and burning the bark. This was a breakthrough for forest managers that allowed them to capture the economic value of susceptible trees before they were killed by bark beetles, and at the same time resulted in decreased beetle populations or at least seemed to prevent outbreaks. The Salman-Bongberg California risk-rating system identified susceptible trees by assigning penalty points to crown and stem characteristics of a tree. This was followed up by a logging practice called sanitation salvage (Smith et al. 1981). The Keen system, involved four classes based on age and four vigor classes within each age class. It was oriented more toward identifying the susceptibility of individual trees to insect attack. Keen also assigned penalty points in his system. It was slightly more complex to use and was not directly tied to the sanitation salvage concept, but a certain level of logging of susceptible trees was generally followed. Keen's classification was more widely used in ponderosa pine stands of eastern Oregon, and the California system was used for both ponderosa pine and Jeffrey pine stands in eastern California.

One important result of sanitation-salvage logging was the longevity of its effectiveness in reducing high losses in stands to bark beetles. In a study at Blacks Mountain Experimental Forest, the removal of as little as 10 to 15 percent of the stand volume in high-risk trees reduced subsequent losses by an average of 82 percent for more than

PSW

Figure 75—Ponderosa pine killed by western pine beetle during the 1930s outbreak, Modoc National Forest.

20 years (Wickman and Eaton 1962). As study results were published in the 1940s, McCloud River Lumber Company, Collins Pine, and the Forest Service quickly adopted sanitation salvage as a silvicultural practice in east-side California pine forests (Smith et al. 1981).

Miller should be recognized as probably the first entomologist to study how tree growth rate (as an indicator of stress) was related to susceptibility to bark beetle attack. He measured tree growth on thousands of increment cores as part of his studies on the Sierra National Forest in the 1920s. Further, his encouragement to younger scientists like Person to follow his lead to fruition of their own ideas, demonstrated unselfish leadership on his part.

The drought-related stress to trees on million of acres of ponderosa pine forests in the inland West caused dramatic levels of tree mortality that could not be ignored by politicians (fig. 75). Miller, Keen, and Patterson also played a clever propaganda game to procure appropriations to increase the research efforts on the western pine beetle. During the depression, government agencies provided some level of support for artists, cartographers, and draftsmen as a "make work" program. These artisans were eagerly employed by Miller at bargain prices to produce hand-colored photo albums showing the extent of the tree mortality caused by bark beetles, what was being done, and what was needed in the form of research programs to curb this wasteful tree loss (fig. 76) (Struble 1953). Miller got the

$200,000,000 Tree Beetle!

The Forest Menace

Give Science a Chance

BATTLE THE BEETLE

GOVERNMENT ASKED TO GIVE AID IN BATTLE AGAINST THE DESTRUCTIVE PINE BARK BEETLE

California has every reason to hope that the modest request that Congress appropriate $50,000 to combat the pine bark beetle in this State will be granted.

cooperating with Congressman Clarence F. Lea, who has introduced the resolution. If the money is forthcoming, the United States Bureau of Entomology and Plant Quarantine

PSW

Figure 76—Beetle propaganda for the making of lantern slides, 1937.

Joan Salman Rhodes

Figure 77—Hackamore Field Station living quarters and Salman's daughter, Joan, 1933.

message across by supplying these albums to trade associations, chambers of commerce, politicians, and universities. The appropriations increased during a period when many agencies and laboratories like Burke's were shut down. The increased funding helped get the tree selection research of Keen and Salman operational within a decade, a short turnaround time for such research. It also resulted in an increase of scientific research at the Berkeley Laboratory. Struble, who started in 1928, was made a permanent employee in 1930. Other entomologists and foresters hired included Phil Johnson (1931), Jack Bongberg (1934), Jack Whiteside (1935), Stu Yuill (1935), A.S. West, Jr. (1937), Ralph Hall (1938), Howard McKenzie (1938), and J.W. Johnson (1940). Other entomologists who spent some time at the Berkeley lab during this period and then transferred elsewhere included R.L. Furniss, C.B. Eaton, N.D. Wygant, W.D. Bedard, and D. DeLeon (Furniss and Wickman 1998).

The appropriation increases triggered by the bark beetle outbreaks also resulted in forest insect research reverting to a mode of operation used before the move to Stanford University. That is, field stations, strategically located out in the forests, were once again being considered to house entomologists and provide laboratories closer to their research sites. And the wherewithal to build such stations was available through depression-era programs like the WPA and CCC. A rather crude station was built at Hackamore in the Modoc National Forest. It consisted of small cabins and a small lab and rearing building for study of the western pine beetle. Some early forest entomologists like Robert Furniss, A.S. West, Jr., Jack Whiteside, and Jack Bongberg, worked there under Salman. The buildings at this site were the temporary type, probably because it was not at a convenient location (fig. 77).[2]

The next two field stations established were more elaborate, however, both in size and quality of construction. Struble described the establishment of these two field stations (Struble 1953).

> Extensive bark beetle infestations and losses in California by 1937 offered convincing proof of the need for research data season by season in the field. Centers having common features of climate, topography, soil and stand were believed important. Differences in infestations between trees in eastside and westside (Sierra) forests were recognized, and insect control would of necessity depend on an applicable information base.
>
> Public support for establishing permanent field centers of research (California State Chamber of Commerce) had reached a climax of interest by the fall, 1937. Funds totaling $7,000 were allocated by the USDA's Bureau of Entomology & Plant Quarantine to the U.S. Forest Service. Representing eastside conditions, a laboratory was located near Hat Creek Ranger Station, Shasta County on the Lassen National Forest. A second laboratory, typifying westside forest conditions was located near Miami Ranger Station, Mariposa County on the Sierra National Forest. Both facilities were erected by CCC crews under Forest Service supervision and in operation by summer of 1938. Each consisted of

[2] Personal communication from Joan Salman Rhodes, who also provided photos, 2004.

PSW

Figure 78—Civilian Conservation Corps crew injecting girdled tree with chemicals, 1930s.

J.E. Patterson, PSW

Figure 79—Staff building bunkhouse with treated logs as an experiment, Hat Creek. On wall, R.C. Hall, P.C. Johnson; on logs, J.E. Patterson, G.R. Struble, 1943.

> office, laboratory, rearing facilities, shop, garage, and camp living facilities.
>
> The Hat Creek Laboratory served initially as a study base for developing improved methods to control the western pine beetle. The identity and use of visual tree difference indicators of risk against attacks were being tested and refined at Black's Mountain [Experimental Forest] nearby under the direction of Salman and Bongberg. The flathead [flatheaded woodborer] and survey improvement studies at Hackamore were transferred to the Hat Creek base.

Robert Z. Callaham, who was a graduate school student assistant for Miller, described the unique log dormitory built by the entomologists in 1943 at Hat Creek.[3]

> Ralph Hall told me that logs used to build the Hat Creek Lab were cut from trees that had been subjected, before felling, to injection of preservative chemicals. Using techniques pioneered by H.L. Person and Nick Mirov (1928-1930), workers had girdled each tree with an axe creating a frill just above the stump height. Just below the frill, a reservoir made from an inner tube from a truck or auto tire was sealed with nails around the trunk. The rubber reservoir was rounded upward resembling a doughnut and chemicals were placed inside to flood the frilled area [fig. 78]. The tree's conduction system moved the toxicants upward in the exposed outer annual rings. The result was that logs subsequently cut from injected trees, when placed vertically to form walls, were never successfully attacked by insects or fungi [fig. 79]. The bark clung tight rather than peeling off as it would have if wood-boring insects had been able to penetrate. For all I know, those log walls may still be standing with bark intact.[4]

By 1938, Forest Insect Investigations had come full circle from field stations in 1910-23, to laboratories at Stanford and then California Universities back to having the best of both types of facilities. Permanent laboratories located on major university campuses provided access to libraries, laboratory equipment, and interaction with other scientists. It also provided for stable residences in cities amenable to family life. The permanent field stations were usually used only spring, summer, and fall and allowed the entomologists convenience to their field studies with some laboratory facilities. It also allowed many families of entomologists to

[3] Personal correspondence from Dr. R.Z. Callaham, 2004.

[4] I reexamined the logs periodically for bark retention and rot when I was in charge of Hat Creek 1956-67 and found the logs sound and bark tight. An examination by a historical archaeology consultant in 2004 reported similar conditions.

R.L. Furniss, PNW

Figure 80—Felling dead trees after the Tillamook burn, 1930s.

R.L. Furniss, PNW

Figure 81—R.L. Furniss pointing out larval galleries of wood-boring insects in fire-damaged Douglas-fir, Tillamook Burn.

spend very memorable summers at the Hat Creek and Miami Field Bases.

Further north in Oregon, Keen was also fighting his battles against forest insects, only with fewer resources available to him than in California. A young entomologist, Robert L. Furniss, was assigned to him from the California laboratory in 1934. The disastrous Tillamook Fire burned its first quarter million acres in 1933. Subsequent fires and reburns occurred over the next decade. Attempts to salvage huge amounts of fire-damaged timber were complicated by woodborer attacks that were causing degradation of lumber sawn from the fire salvage logs. Furniss' first assignment in 1934 was to study the species of woodborers attacking the dead trees. He also made a fine photographic record of the insect damage and salvage operations (fig. 80) (Wickman et al. 2002).

Some other Berkeley personnel moved to Portland, Oregon, to help Keen, including Jack Whiteside and William Bedard, Sr. Whiteside and Bedard assisted Keen with surveys and studies of the western pine beetle outbreaks. Furniss mostly studied insects associated with Douglas-fir (fig. 81).

Miller's diaries for this period indicated a change in his field work. In 1930, because of the move from Palo Alto to Berkeley, he spent most of the year traveling back and forth between the two stations. As one would expect, he had much equipment to move, new offices and laboratories to outfit, and the need to establish working relations between the Forest Insect Laboratory and the University of California Forestry School, and California Forest Experiment Station (now the Pacific Southwest Research Station). The terms, "Forest Insect Investigations" and "Forest Insect Laboratories" seemed to be used commonly from this time on.

By 1931, Miller was able to make about half a dozen field trips to Grant Grove National Park, Pinehurst, and an entomology camp at Harvey Valley and the Pickering Mill in Alturas. There was no mention of a trip to Yosemite, and this was unusual because until 1930 he was there several times a year.

However, Miller was not deskbound long at the new lab in Berkeley. From 1932 to the end of the decade, he traveled constantly from March to November, from the San Bernardino Mountains in southern California to the temporary Hackamore Forest Insect Field Station in the Modoc National Forest near the Oregon border. He also went to Portland several times to confer with Keen at his new lab, but there is no mention of Keen reciprocating.

He made up for missing 2 years of visits to Yosemite National Park by going there as many as eight times in some years and usually at least half a dozen times a year.

Diary entries are sparse on the purpose of various trips, but reports and publications indicate he was doing research on bark beetles at Eight-Mile (Yosemite National Park), Bass Lake, Harvey Valley, Hackamore, and other localities

as well as supervising a growing group of young entomologists. The supervisory duties alone must have been daunting. His entry for November 5, 1935: "Paid Bongberg's Doctors bill—$2.50." Bongberg, being one of the new entomologists, may have been a little short before payday. Miller also went farther afield to Yellowstone and Grand Canyon National Parks, Prescott, Arizona (McKenzie was there studying the Prescott scale on ponderosa pine) and Fort Collins and Estes Park, Colorado. He even left on Christmas Eve, 1936, on a trip to Washington, D.C., to see Craighead. That seemed a little beyond the normal call of duty.

He was almost constantly on the go for an 8-year period. His daughter, Betty, noted that she did not see much of him at times.[5]

As described earlier, the building of two new field stations at Hat Creek on the Lassen National Forest and at Miami on the Sierra National Forest in 1938 took up an inordinate amount of his time and travel. And all of this as the most damaging bark beetle outbreaks on record were occurring throughout California. Miller's leadership and entomological and political acumen resulted in increased support for the Forest Insect Investigations Laboratory at Berkeley and some breakthrough research being carried out by relatively inexperienced, young entomologists. Miller sums up the decade as follows (Miller and Keen, n.d.):

> The setting up of the Portland Laboratory in 1931 was the most recent step of the Division in establishing new centers of work for western pine beetle investigations. For the next decade a great amount of research was centered around the laboratories at Berkeley and Portland and their outlying field locations [fig. 82]. It is the accumulation of the results of these and proceeding studies which calls for the summarization of this review. [The published book: Biology and Control of the Western Pine Beetle, with Keen].
>
> It was during this recent period that a very active interest in the problem was developed by certain public agencies such as the Western Pine Association and the California State Chamber of Commerce which includes many large owners of pine timber in its membership. This interest can be attributed to a period of very heavy beetle-caused losses in commercial pine areas beginning in 1927 and continuing until 1938. The groups concerned brought considerable pressure for an expanded program of research and surveys by the Division and in 1937 increased appropriations were secured.
>
> These new funds were applied mainly on a forest insect hazard survey of the eastside pine region in Northern California. Additional personnel were added to the Berkeley laboratory until in 1939 it had a staff of 15 permanent employees in addition to summer field crews of about 20 foresters and entomologists.

PNW

Figure 82—Portland, Oregon, conference, 1936. Front row (left to right) R.L. Furniss, J. Beal, J. Evenden. Back row (left to right) F.P. Keen, J.M. Miller, A.J. Jaenicke, F.C. Craighead, and W. Buckhorn.

But changes of a different kind were on the horizon. The challenge of keeping forest entomology research on track through World War II would test Miller again.

[5] Correspondence from Mrs. Betty Miller Moore, 2002.

CHAPTER 16: Miller Closes His Bureau of Entomology Career

By 1940, Miller was at the apex of his career. He had the largest forest insect laboratory in the West, working on some of the most important forest insect problems in the United States; consequently, he probably had the largest budget. Bark beetle problems were being researched by 10 professional foresters and entomologists at Berkeley. They were developing improved survey methods and determining pine forests and individual trees most susceptible to outbreaks. However, the Congressional appropriation for fiscal year 1941 cut $27,000 from the Berkeley Lab's budget. This caused considerable strain on the program of work including cutting back on the hazard survey.[1]

Continually working long hours, Miller still must have found the weekend commutes from Berkeley to his home in Palo Alto irksome. On New Year's Eve, 1939, the family rented out the Palo Alto house and moved to a rental in Berkeley. It lasted only 1 year, partly because Bess missed her garden and familiar surroundings.

In 1940 and 1941, Miller made many field trips to the crude Hackamore Field Station located at a Pickering Lumber Company Camp to check Salman's stand hazard survey conducted by Phil Johnson. This was an ambitious attempt to map 2 million acres of pine stands in northern California at risk to western beetles. At the new Hat Creek Field Station and Blacks Mountain Experimental Forest, Bongberg, Patterson, and Hall were studying the western pine beetle and pine engraver beetle. At the new Miami Field Station, Struble was busy with mountain pine beetle and other insects attacking sugar pine. It is interesting that Miller only recorded one meeting with Keen at the new Portland Forest Insect Lab during these 2 years. Keen was hard pressed with many insect problems in the Pacific Northwest and a much smaller budget that initially supported only two entomologists.

Miller's diary entry for Sunday, December 7, 1941, read: " . . . at 12:15 P.M. just heard the report of the attack on Pearl Harbor." On that day the lives of everyone in the United States changed in some manner. And only those Government bureaus demonstrating a contribution to the war effort survived, but most did so with reduced budgets and personnel. The Bureau of Entomology was no exception. Miller's diary for 1942 indicates meetings in Washington, D.C., February 18-21, and Portland, Oregon, in March. In May, Mr. Whitney of the Budget Bureau made a visit to the Berkeley lab and was given a tour of several field projects by Miller. The Berkeley lab survived, no doubt because of its ties to the Forest Service and the importance of forest protection and lumber production needed for the war effort, but research programs were affected as Miller noted (Miller and Keen, n.d.):

> In the spring of 1942 the impact of World War II began to have its effect upon the plans and personnel for the western pine beetle program. Although there were substantial cuts in the appropriations for the fiscal years of 1942 and 1943, the need for funds soon became less important as the call for men at both laboratories for military duty reduced the staff and replacements were no longer available. Priorities of the war program eliminated a number of projects and the restrictions placed upon travel made it difficult to continue the essential jobs on an adequate scale.

Bongberg and Yuill joined the U.S. Navy as officers in medical entomology, and Bedard was transferred to Berkeley from Coeur d'Alene to help fill the vacancies. On the personal side, Miller's son Dusty (Harold), a naval officer, left for duty at Pearl Harbor on June 15. Miller did a lot of travel to Hat Creek and Miami during the 1942 field season no doubt helping Patterson, Hall, and Struble who were still on duty, but very short handed.

And matters came to a head in Salman's resignation in 1942, which involved Craighead in the Washington office. Although Salman and Keen had some competitive studies relating to different tree classification systems, both systems were scientifically valid. As mentioned earlier, their use by forest managers was related to geography, and Salman and Keen did not seem to take the situation personally. However, at this time Craighead thought that chemicals could be injected into high-risk trees, perhaps preventing beetle attacks and thus preserving them until they could be logged. Salman evidently objected to this idea heatedly, and

[1] Correspondence to Miller from Craighead, Chief of the Forest Insect Investigations, Washington, D.C., in my possession.

a controversy developed to the point that Salman resigned from the Bureau of Entomology in 1942.[2]

Miller describes an important reorganization of the Berkeley and Portland labs as follows (Miller and Keen, n.d.):

> In order to better mobilize what resources were available in men and facilities for continuing the essential phases of the western pine beetle program, a reorganization plan was decided upon by the Division to take effect in August 1942. The Berkeley and Portland laboratories were combined under a joint administration in order to effectively integrate the program in both regions. Each laboratory was continued at its established location to continue the assignments and local contacts of the over-all program, but the Portland laboratory was brought under general direction from Berkeley. The more important personnel changes brought about by the reorganization were the assignment of F.P. Keen as coordinator of the 2 laboratories with headquarters at Berkeley, J.M. Miller being relieved of administrative work in order that he could give full time to a summarization of western pine beetle studies prior to his retirement, R.L. Furniss assigned as Administrator for the Portland Laboratory, and J.E. Patterson for the Berkeley laboratory.

Miller had some inkling of the impending change because Mr. Annuad, acting chief of the Bureau of Entomology in the Washington office, had just visited with Miller in Berkeley. Miller's handwritten note to Keen in Portland is included verbatim.[3]

> Berkeley, Cal.
> Aug. 3, 1942
> Dear Paul Keen,
>
> I have just perused two memoranda which came in the mail this afternoon and they look like memorable documents for both of us. At last Annuad has settled something, and the tone of these notifications seems to indicate that it is final. You are going to take over here.
>
> I imagine that you are trying to guess what my reactions are to the change mainly because I am trying to guess yours. I might as well relieve any misgivings you may have by telling you that this was just what I wanted. In fact it looks too good to be true as to last very long.
>
> Both documents say a lot with unusual clarity and brevity. It pleases me beyond measure that along with change you are to have "full responsibility to make all personnel assignments under the combined program." It is my feeling that the change is going to be welcomed by most of the personnel here.
>
> It looks as though you are going to have an expensive luxury on your hands in the form of a high priced "technical advisor." Well, I am not going to take the title too seriously. I only want to smooth the way for you to come in here as well as I can, and to cause you as little embarrassment as possible. I will fit in anywhere you think I can be of the most usefulness, and if I can't be of some help to you it is my intention to go ahead with plans for early retirement soon after I become eligible.
>
> Apparently you will need to come down here soon to get the lay of the land. We are in the process of a clerical turn-over since LeBallister [the office clerk] is due to be called by the Navy within 15 days. There are a lot of other loose ends since about half of our force has left or is leaving. I have several field trips projected within the next three weeks, but will hold these up pending your plans. Please let me hear from you as soon as you recover from the shock.
>
> Anyway it is a long lane that has no turning– and this seems to be it.
> Sincerely,
> John M. Miller

In Keen's oral history he stated (Maunder 1974):

> I arrived in Berkeley on November 10 [from Portland, Oregon]. The Berkeley station consisted of a well run organization with the following men: J.M. Miller, in charge and ready to retire; John Patterson, Ralph Hall, Jack Bongberg, Phil Johnson, George Struble, Stu Yuill, Charles Eaton, Don DeLeon, and Howard McKenzie; plus the

[2] Both the Author and Malcolm Furniss have searched official files for information on this controversy. Furniss found one memo April 20, 1942, from Craighead to Miller regarding personnel changes, e.g., Salman on leave until May 11 and Craighead waiting for Salman to decide what action he will take. Both Furniss and the author have heard various hearsay stories from entomologists in Berkeley on this situation. Suffice to say Salman felt strongly enough to resign in 1942 and take up farming in the central valley of California. Salman's daughter Joan, believes it was an accumulation of actions by management over some period of time that caused him to resign because he had moved his family to his farm the year before he resigned. Personal letter, Joan Salman Rhodes to me August 22, 2004.

[3] A handwritten letter from Miller to Keen on August 3, 1942, in possession of Malcolm Furniss.

Figure 83—Work conference in Berkeley, 1941 or 1942. Front L to R, Gibson, DeLeon, Lois Weaver, Eaton. Second row, Evenden, Keen, Struble, Wygant, Yuill. Third row Miller, P. Johnson, Johnson, Hall, Patterson. Fourth row, LeBalister, Salman, Hagle, Bongberg, McKenzie.

administrative staff of the chief clerk, M.L. LeBallister and secretary, Lois Weaver[4] [fig. 83].

There were hints of Miller's possible retirement in 1943, and Keen even thought he retired in 1943 (Maunder 1974). But Miller actually remained as part of the Berkeley staff as an independent scientist or "technical advisor" for 9 more years.

Unfortunately, Miller developed some health problems in 1943, so perhaps the administrative change was timely. These problems continued for the next 3 years. Notes at the back of his 1944 diary state: "spots, I can recognize pressure, some days better than others, ultimate use of drug." Consultations with half a dozen physicians and eye specialists continued until he had an apparently successful eye operation on December 14, 1946, in Palo Alto.

There were many weeks and days of sick leave taken during this period, but though he must have been uncomfortable during many of his field trips, he continued to help the personnel at the Berkeley lab during the manpower shortage at the height of World War II. He also did not neglect trips to Yosemite National Park (fig. 84). Most of his office work consisted of working on a manuscript of the grand summary of 30 years of research on the *Biology and Control of the Western Pine Beetle*. Another task he took on was encouraging Burke to write his memoirs, then spending months editing the manuscript drafts. Miller's diary for Sunday, March 15, 1944, states "Keen and Patterson [with Miller] made a trip to Los Gatos and spent part of the day with the Burkes." This was the first diary entry mentioning Burke for years, and I highly suspect that his three old comrades made a semiofficial visit to the Burke farm to talk him into writing up his recollections.

This was an important visit for the history of forest entomology in the Western United States. Miller's diaries for the next several years described working on the "Burke Summary" as he termed it. On June 28, 1946,

[4] Keen's memory was a little off. Miller had not decided to retire, LeBallister was in the Navy, and Bongberg and Yuill were about to enlist as Naval officers.

P.C. Johnson, PSW

Figure 84—Entomology staff, Berkeley, California, 1946. Front (left to right) Paul Keen, Edith Edmonston, John Miller; back (left to right) George Struble, Ralph Hall, John Patterson, and Philip Johnson. Bongberg was probably still in the Navy.

My Recollections of the First Years in Forest Entomology by H.E. Burke was issued in small numbers as an unpublished report by the Berkeley Forest Insect Laboratory. It was printed by using an old mimeograph process with gelatin plates producing blue print that got fainter with each succeeding copy. Needless to say, after about 100 copies the print was pretty light. Photographs, mostly from the Berkeley photograph file, were reproduced and glued in the report. Only about half of the copies were assembled in final form for distribution and they disappeared rapidly.

In the winter of 1948-49, I was working part time as a student aid at the Berkeley laboratory while attending the university. My first job was to assemble the remaining loose pages, hot-iron photos in place, and staple on covers. This was my introduction to forest entomology history in the West and resulted in my only introduction to Burke, who came by to pick up a few copies. He was a kindly and distinguished-looking gentleman who thanked me and left. I have had regrets ever since that I did not have him sign the copy I was allowed to keep. Burke's personal history, *My Recollections . . .* ended in 1923, but it set the stage for all that followed relating to forest entomology on the Pacific slope.

In 1946, Miller became involved in research on breeding pines resistant to forest insects. Dr. Palmer Stockwell, Director of the Institute of Forest Genetics (IFG), a field station of California Forest Experiment Station (now Pacific Southwest Research Station), asked Keen for assistance of an entomologist to investigate resistance of IFG's pine hybrids. Keen negotiated with Miller, who had just completed his part in production of the "Burke Summary," and Miller agreed to take on this assignment. Located near Placerville, in the foothills of the Sierra Nevada, IFG was moving toward mass production of interspecific pine hybrids for outplanting on national forests in California. Miller's task was to determine whether some of these new hybrids might be resistant to troublesome insects.

Miller, until he retired 6 years later, became for all practical purposes, the resident entomologist at IFG. He had his own office, spacious laboratories, and opportunities for insect rearing in the progeny test plantings. One of IFG's scientists happened to be Dr. N.T. "Nick" Mirov, a plant physiologist with a colorful past. Nick, a university-trained forester in Czarist Russia, had served as a naval cadet in the White Russian navy. After Russia's Revolution, Nick escaped through Siberia and China and made his way to San Francisco and Berkeley. Miller probably came to know Mirov in 1928 and 1929 when Mirov was hired to assist Hubert L. Person's studies on the Modoc and Lassen National Forests on host selection by bark beetles.[5]

Miller was researching the susceptibility of certain crossbred ponderosa pines to the pine reproduction weevil. This weevil had been described by C.B. Eaton and named for him (Eaton 1942). Before WWII, it was causing extensive problems in ponderosa and Jeffrey pine plantations. It was killing many trees before they could outgrow old, established manzanita brush fields.

There were thousands of acres of manzanita brush fields in northern California resulting from fires in the 19th century. Most of these areas were completely devoid of trees because trees were not able to become established. The Forest Service, in an attempt to reclaim these brush fields to valuable timber lands, planted thousands of acres especially around Mount Shasta. Unfortunately, the tiny weevil

[5] Personal communication from R.Z. Callaham.

attacked most of the trees several years after planting. Some brush fields were planted several times. The new insecticide, DDT, sprayed from helicopters was the very latest technology used to try to control the weevil. Because the weevil spends much of its life cycle under the bark or in the wood of attacked trees, aerial spraying resulted in inconsistent control. In tests at IFG, Miller found by forcing attacks on young trees that Jeffrey pine-Coulter pine hybrids were resistant to weevil attack. Several students including Robert Z. Callaham, were introduced to the intricacies of genetic experimental designs as a result of Miller's mentoring at the Institute. Callaham was assigned by Keen to assist Miller while taking graduate studies in botany and genetics.

Callaham related his research with Miller at the IFG in a letter to Malcolm Furniss in 1993 (copy in my possession).

> After reporting on my work in the Lagunas, Keen assigned me during the winter of 1950-1951 to assist John Miller at the Institute of Forest Genetics (IFG) at Placerville. In 1946 Dr. Palmer Stockwell, who was in charge at IFG, had requested the Berkeley Forest Insect Lab to study resistance of pine species and species hybrids to forest insects. Miller was assigned to work at IFG. What follows is taken from a paper that I presented in 1953.[6]
>
> Miller soon discovered by forcing attacks on these trees that each pine species varied in its inherent resistance to the pine reproduction weevil [Miller 1950]. This resistance ranged from complete resistance on the part of coulter pine through intermediate resistance on the part of Jeffrey and ponderosa pines to a very high degree of susceptibility on the part of Apache pine and Rocky Mountain ponderosa pine. F_1 and natural hybrids between resistant and susceptible species usually exhibited a degree of susceptibility intermediate between that of the two parent species. Miller expended considerable time in studying the entire problem; however, up to the present time, we have not been able to determine the cause of resistance or to determine why resistance varies from season to season in trees of certain species and between races of the same species . . .
>
> The pine reproduction weevil had decimated the Jeffrey pine plantations on the west flank of Mt. Shasta, close to Mt. Shasta City. Some of my earliest recollections of work with JM in the field were of going to that location where trees had been planted about 12 years before in strips punched through the brush by bulldozers. We collected infested stems, hauled them to IFG in his "sedan delivery," and spread them throughout the rows of two- to four-foot-tall pine progenies. These had previously been enclosed within large zippered screen cages. The weevils emerging in the spring went about their business. By summer trees were fading and John suddenly retired. That left me alone during the winter of 1951-1952 to tally the resulting mortality and produce a report on our work [Callaham and Miller 1952].
>
> That report also included results of our first attempts, during the summer of 1951, to determine resistance of larger, 20-years or older pines to *Dendroctonus* species. John and I planned and conducted the first forced attacks of *D. brevicomis* (D.b.), *D. Jeffreyi* (D.j.), and *D. monticolae* (D.m.) on various pine species and species hybrids. John had wanted for many years to force Db to attack Jeffrey pine and its hybrids and to force Dj to attack ponderosa pine and its hybrids. He and I planned the work, but I carried it out alone when he suddenly retired in 1951.[7]

Miller was truly a versatile and inquisitive scientist who very late in his career pioneered searching for inherent resistance to pine-infesting insects.

To demonstrate his practical side, Miller spent October 25 and 26, 1950, on some aerial survey flights in the Armstrong Lookout area on the Stanislaus National Forest. His eyesight and vertigo problems must have improved because spotting bark-beetle-killed trees from the air requires good vision and a settled stomach.

Miller's last diary was for the year 1950. The last entries for that year were; November 5–"air flight over Stanislaus and Eldorado Country," and November 18–"Stanford-Army game." He didn't say who won, but Miller was still a dedicated football fan. He went to high school games when living in Ashland, and he rarely missed a "Big Game" between Stanford and California. In addition to

[6] Callaham, R.Z. 1953. Studies of the resistance of pines to beetles. Presentation to the Entomological Society of America, Pacific Coast Section, South Lake Tahoe, 9 p.

[7] I remember assisting Callaham with some of these studies when I was a student aide at the Forest Insect Lab.

playing and watching football, as a young man he enjoyed trout fishing and deer hunting. He progressed from traveling by horseback, stage coach, and shank's mare to being one of the first forest entomologists to own and use an automobile for field trips. In the process, he became an auto repairman of note, developing the ability to fix brakes, flywheels, radiators, water pumps, oil pan punctures, and innumerable flat tires, and to pound out dents caused by errant pine trees. He was the first forest entomologist in the West to take photographs of bark-beetle-killed trees from an Army Air Service biplane. His personal science was exemplary. He was a father figure and mentor to many young entomologists and foresters. He was a soft-spoken politician who knew how to get funding for his lab. There are no documented remarks disparaging him in any way—he was considered a gentleman, a scholar, and a leader by his contemporaries.

Keen sent letters to "Friends of John Miller" announcing John's retirement on November 1, 1951, after 44 years of government service.[8] In his usual modest way, Miller did not want a "fuss" made, but if a party was to be given by the Forest Insect Lab "please keep it simple." An informal goodwill luncheon on October 30 at the El Dumpo restaurant in Berkeley ended his official career. Farewell letters from colleagues and friends filled a little booklet presented to him. One typical letter stated "I can honestly say you treated me more like a friend than underling. You were one swell boss!"[9]

Ironically, the Bureau of Entomology Forest Insect Division, converted to the Forest Service, California Forest and Range Experiment Station just 3 years after Miller retired. He almost went full circle back to the U.S. Forest Service.

At nearly 70, Miller had no intention of just fading away. He was actively seeking an assignment with the Food and Agriculture Organization as a consultant to the Mexican government helping with their bark beetle problems. If that did not materialize, he planned to continue his research at IFG on genetics of bark beetles in a volunteer status. John Miller just could not stop being an entomologist.

[8] Letter in possession of Malcolm Furniss.

[9] Retirement letters, bound, in my possession.

Epilogue

Harry Eugene Burke 1878-1963

Burke retired ahead of his time in 1934 at age 57 (fig. 85). After several years of consulting on shade and ornamental tree entomology, giving talks to garden clubs, and helping write a textbook on forest entomology with professor Doane at Stanford University, he realized his professional career had ended. This was unfortunate because, of all of the forest entomologists of his era, he was perhaps the one most sensitive to the natural long-term role of insects in forests. This ecological bent sometimes put him at odds with other professionals who believed that most forest insect pests were to be destroyed or at least reduced to population levels as low as possible. Growing trees, not insects, was the order of the day. Burke saw insects as just another disturbance agent in the forests–neither good nor bad, but playing a long-term role in a forests' life history. Even though he sprayed trees with chemicals in Yellowstone National Park and other places to kill tree-damaging insects, he became increasingly critical of insect control projects, especially in national parks where trees were not managed for their economic value as saw logs. He was a good 50 years ahead of his time in this philosophy. If he had worked another decade or so there is no telling what influence he would have had on insect control policies, especially in national parks where today insect outbreaks are not treated.

Burke authored 63 publications during a period from 1905 to 1940. This was a noteworthy publishing record for a field entomologist during that era. He was also president of the Pacific branch of the Entomological Society of America in 1935, several years after he retired.

With his creative instincts thwarted, Burke directed his energy toward agricultural pursuits. David Pratt, his grandson, remembers his retirement as follows:

> My grandfather's primary hobbies after he retired were gardening and reading. In late 1938, my grandparents and parents moved into a large two story home in Los Gatos (where I spent the first 13+ years of my life). The home was situated on a two acre lot which had approximately one acre of fruit trees (apricots, prunes, almonds and who knows what else). There were three chicken coops, occupied by ducks, geese, chickens and rabbits. There was a large vegetable garden, lots of berrys and loads of other stuff. The place was ringed by a four foot hog wire fence and every post had a grape growing up it. This kept him very busy until about a year before he died.[1]

Figure 85—Harry Eugene Burke 1878-1963.

Burke greatly enjoyed all of his grandchildren and no doubt taught them much about the natural world. His daughters remember hikes with their father in Yosemite National Park, where he continued to camp after he retired. They took off on these adventures not for distance or speed, but learning all kinds of things about flowers, trees, bugs, and nature in general.

Family members say his mind was sharp and memory excellent in old age. When he died at age 84 on March 26, 1963, in Los Gatos, California, C.B. Eaton, a newcomer when Burke retired, and F.P. Keen, the first entomologist Burke hired, wrote the following about him in his obituary published in *The Journal of Economic Entomology* (Eaton and Keen 1964):

> Dr. Burke was gifted with a friendly, affable personality. He was a good conversationalist and an interesting storyteller. He enjoyed a broad

[1] Correspondence from David Pratt in 2002.

> acquaintance with men in his field and always spoke well of them. He was held in esteem as an entomologist for the intimate details of knowledge concerning large numbers of insect species. His leadership was recognized and respected in applied forest insect control.

It is interesting to note that they memorialized his insect control activities. But I maintain that he was also one of our profession's earliest forest ecologists. Regardless of either viewpoint, Burke was liked and respected as an entomologist and a person. Burke was cremated and his ashes found a fitting resting place. His daughter deposited them in the Sierra Nevada Mountains near Lake Tahoe.[2]

John Martin Miller, 1882-1952

To sum up John Miller's career in a few sentences is difficult (fig. 86). He was the second university-trained forest entomologist on the scene in California and Oregon after Burke. Luckily for our profession, Burke and Miller became friends and coleaders of the fledgling science of forest entomology in the second decade of the 20th century. Miller's coworkers, subordinates, and professional colleagues remarked on his work ethic, his care for people's well-being, his quiet demeanor, and his firm convictions. He had the ability to analyze problems and pursue a course of action, but not at the expense of animosity, even when the problems were controversial. His relationship with A.D. Hopkins before he joined the Bureau of Entomology is a good example.

Having started his career as a ranger in the U.S. Forest Service, he had great empathy for the field manager. His personal and unit's research projects were oriented first and foremost toward assisting forest managers with their insect problems. However, this did not prevent him from encouraging basic research or from following his own curiosity like using airplanes in forest insect surveys or studying the role of tree genetics in managing forest pests.

He produced many important technical reports on a timely basis, and this sometimes precluded more formal

Figure 86—John Martin Miller, 1882-1952.

publications. However, his book with F.P. Keen, *Biology and Control of the Western Pine Beetle*, summarized over 50 years of research (Miller and Keen 1960). It is a classic and still the basic reference for entomologists studying bark beetles. He was also an excellent photographer who continuously improved his equipment and techniques. He usually had a darkroom in both his home and at work.

Miller was at his best when in the field. He was noted for his walking ability, and many young workers struggled to keep up with him. In his later years, he became a little forgetful when afield. He usually carried quite a bit of photographic equipment, and it became normal to assign someone in the field party to follow Miller and pick up his glasses, notebook, or camera filters he may have left on a log or a rock. This, of course, was done most discreetly.[3]

When Miller retired, he had already applied for a job consulting with the Mexican government helping with their bark beetle problems. This assignment was under the auspices of the Food and Agriculture Organization of the United Nations.

Just before retirement he made an exploratory trip to Mexico to examine the prospects. Of course he always

[2] Grandson, Paul Pratt, remembers that his mother, Marion Burke Pratt, took her father's ashes up the KT-22 ski lift at Squaw Valley and then walked around the south side of the peak looking out toward the Rubicon River to scatter them. E-mail to me July 20, 2004.

[3] I know, because I had one such assignment.

carried a camera, and the Mexican police accused him of taking photographs in a prohibited area. Miller was briefly detained (some say in the local jail) until the matter was resolved in Miller's favor. Of course when he returned to the lab at Berkeley and the story was leaked he was in for much good-natured ribbing by his colleagues.

Since the Mexican assignment was international, Miller was in competition with an Italian entomologist for the job. When he took his physical examination, the doctor said he had some heart problems. Miller found another doctor who gave him a passing physical. He also had glaucoma and feared this would end his Mexican job if exposed. He was accepted for the assignment and in 1952 went to Mexico accompanied by his wife Bess.

The next news received about Miller's Mexican assignment saddened everyone who knew him. F.P. Keen sent word on April 1, 1952, to all forest insect laboratories "…that John Miller had passed away in Mexico City. Details were lacking, but John had returned from Yucatan and had come down with a chill. Mrs. Miller had been with him but had returned recently to the bay area."[4]

In addition to family, many of Miller's old colleagues and current coworkers attended the funeral. His brother, a long-time pastor, presided over the service.

Miller was such a dedicated and hard worker and enjoyed his profession so much, it is not hard to think of him passing away as he lived, curious and active to the end.

Mrs. Burke and Mrs. Miller

This story cannot end without a tribute to two remarkable women. Mrs. Burke and Mrs. Miller were integral parts of their husbands' successful careers. Both of them spent their honeymoons on official trips with their husbands studying insects in the wilderness. Most of their children were born in small mountain towns, usually while their husbands were in the field working. It is understandable that when they acquired their first permanent residences near Stanford University they never moved again. The offspring of both families were highly educated and very successful; both

H.E. Burke family

Figure 87—Marion Armstrong Burke, 1887-1984.

women raised their children well with sometimes minimal help from often-absent husbands.

Marion Armstrong Burke's biography was not included in Burke's memories in the early chapters, so I will add it here. H.E. Burke met his future wife in Washington, D.C., in 1906 (fig. 87). The following excerpts were from a short biography written by one of the Burkes' daughters.[5]

> Marion Armstrong was the oldest child of Luther Kelly Armstrong and Marion Rebecca Brown. She was born March 15, 1887, in Culpeper, Virginia. Both her parents were natives of that state with ancestry that, in the case of her mother, went back to 1617 in the Jamestown colony and in the 1650s in Maryland.
>
> Marion and Gene [H.E. Burke] were married April 8, 1907, in Washington, D.C., and their honeymoon was definitely an eye opener for her. He had a field project scheduled that summer in the wilds of Utah, Kamas and Panquitch Lake. Marion had little experience cooking, let alone over a campfire. Like most white southerners, she was used to black servants doing the menial work. That first wilderness camp experience was a near disaster. Gene was no more experienced with cooking than she. It was a great relief months later as the

[4] Correspondence in possession of Malcolm Furniss. He remembers bringing pine boughs from the Sierra Nevadas to put on Miller's casket. Robert Callaham remembers bringing pine cones from IFG to place on his casket.

[5] Author and date unknown. Probably written by the Burkes' oldest daughter, Marion. Copy provided to me by daughter Janet Burke Eglington.

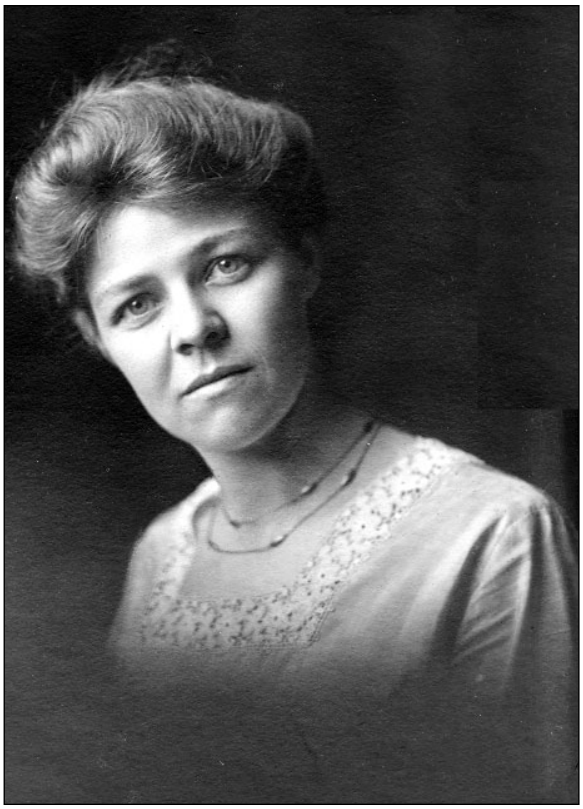
> weather turned real cold, that the Mormon farmer who had brought them to their campsite decided he should check on them as they had seemed greenhorns to him to begin with. Thus he rescued them, as they were by now almost out of supplies.
>
> This experience did not discourage Marion, however. She remained ready and willing to live in whatever western lumbertown or field camp Gene's work took them [to], whether she was pregnant or not, or with the five children they eventually had.

After Harry Burke retired, Marion Burke continued her automobile trips, taking the family to Yosemite or the mountains every summer and doing the driving because Harry still did not like automobiles. She was active in the community of Los Gatos and lived in a large house, helping raise two grandsons for 13 years in the 1940s and 1950s. She was active to the end and lived alone until a week before her death on July 26, 1984, at the age of 97.[6]

Bessie Miller remained at her residence in Palo Alto after John Miller's death (fig. 88). She had long before lost her ardor for camping in the mountains (her daughter Betty remembers often accompanying the Burkes on their annual camping trips because her own mother was through with camping), and she definitely did not like driving an auto. Mrs. Miller became a flower gardener of note, a hobby John Miller was not too fond of because he couldn't do it in a photographic dark room.

Raising and educating their son and daughter became Mrs. Miller's priority. Her daughter remembers her mother's life and wrote the following (Moore 2003):

> Bess lived on after John's death, until 1987. She died at the age of 100 years and 8 months. All but the last 6 years of her widowhood were spent in Palo Alto at the only "permanent" home they ever owned. Bess likewise had hobbies to fill lonely hours. She learned sewing when she was very young, and made clothes for her brothers and sisters and herself as a part of her family duties. She continued to sew for her own family. She had learned the piano when a traveling salesman came to the farm in Missouri and traded his piano for one of her father's horses. Music was something she shared with John. One of the first items bought for the Palo Alto home was a new Steinway piano, and I remember as a child that after dinner, they often played music together—he on the instrument he called a "peck horn" and she on the piano. Bess came from a large family and it was close knit. She enjoyed visiting her relatives and did so whenever she could. She was of a "social" nature and enjoyed social functions in the community, mostly church groups and the "Women's Club." However in later life she became involved with the group of Palo Alto artists and took up lessons in watercolor painting.



J.M. Miller family

Figure 88—Bessie Brose Miller, 1886-1987.

Burke and Miller were extremely lucky men to have had such devoted wives. It couldn't help but have played an important role in their successful professional lives. Behind these two good men were two good women.

[6] Undated letters to me from David Pratt and Janet Eglington.

Acknowledgments

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Other Sources

In addition to the references cited, which were mostly processed reports, published reports, and books, there were other important sources of background material on Burke and Miller. A list of the important sources that are not readily available in archives follows.

Interviews—I had two personal interviews with Burke's grandson, David Pratt, in 2003 and 2004. I spent a very rewarding several hours with Betty Miller Moore, John Miller's daughter, in May 2004. The interviews did not provide specific historical details, but rather gave me a flavor of family life of the two men beyond what I could obtain from written records. In addition, David Pratt organized an index of Burke's photographs, which he shared with me, and which was helpful for choosing illustrations.

Correspondence—I had a spate of letter writing (for 3 years) with the following people once they were aware of my biography project: Janet Burke Eglington and Dorothy Burke Walker (H.E. Burke's daughters), Betty Miller Moore (Miller's daughter), David Pratt, and Paul Pratt (H.E. Burke's grandsons) who lived with the H.E. Burkes for 13 years, and Joan Salman Rhodes, Ken Salman's daughter, who provided photographs and family history.

Dr. Robert Z. Callaham, retired Deputy Chief for Research, USDA Forest Service, who was the last person to work with J.M. Miller on research projects at the Institute of Forest Genetics, Placerville, California.

Except in the case of Dr. Callaham, the letters mostly related to family affairs, like how the families lived at isolated field locations during the summer and anecdotes and family legend. This type of information may not be historically precise, but does add color to the everyday lives of the two entomologists.

Unpublished family documents—Both the Burke and Miller families have saved documents, correspondence, drafts of memoirs, photographs, several privately published Miller family histories, and a compliation of letters from Miller to his future wife. I was allowed to use portions of these letters, and they are included in several chapters covering Miller's Forest Service career before he joined the Bureau of Entomology.

Official government correspondence—Unfortunately, official correspondence often gets purged from government files every several decades. Correspondence dating back to the period of these biographies is rare and, if archived, difficult to locate. I used official correspondence from several sources: Pacific Southwest Region/Pacific Southwest Research Station library, now located at the Rocky Mountain Research Station in Ogden, Utah. The correspondence of Robert L. Furniss (deceased), who was leader of the Portland Forest Insect laboratory. Malcom M. Furniss, retired forest entomologist, Moscow, Idaho, inherited his brother's correspondence file and provided me with valuable letters. The historical forest entomology files at the La Grande Forestry and Range Sciences Laboratory, Pacific Northwest Research Station. And perhaps, most important, historical correspondence I have been collecting since the early 1950s. Particularly important to this story is official correspondence of A.D. Hopkins to H.E. Burke and others from 1910 to 1914. These letters were somehow found and saved by Robert Dolph (deceased) and Charles Sartwell, retired Forest Service forest entomologists, and given to me over 25 years ago.

Western Forest Insect News—this newsletter was suggested at the 1923 Berkeley conference on forest entomology. It was approved by Hopkins and the Chief of the Bureau of Entomology in March 1923. The first issue was dated April 16, 1923, and was called "News Letter—Western Division." A year later, the title was changed to "Western Division Newsletter." On March 1, 1926, the name was changed again to "Western Forest Insect News."

Initially, this informal newsletter had a limited distribution of several dozen copies sent to Western forest entomology workers. The distribution list in the last issue, June 1, 1928, included over 120 people, libraries, universities, and government agencies. The demand for the newsletter became so great that Miller and Burke (the editor) could no longer devote the necessary time and money to its production and distribution.

I know of only three complete sets: mine, Malcolm Furniss', and a set at the Federal Records Center, Seattle, Washington. There may be individual issues scattered in private collections or university libraries. There is a wealth of information over a 5-year period on personnel, research and control projects, and philosophical discourse on forest entomology in the newsletters.

Personal experience—Historians may wince at the mention of a writer using his personal memories as a source for a biography, but I used all information available. To my knowledge, there are only three scientists still alive who worked with and for J.M. Miller. They are Dr. Robert Z. Callaham, Malcolm M. Furniss, and me. Both Callaham and Furniss provided valuable memories of their association with Miller. In my case, during a period from summer of 1948 until Miller's retirement, I did field and office work for Miller, Patterson, Keen, Hall, Bongberg, and Struble. After my professional appointment in 1956, I worked for Hall and C.B. Eaton. All of these pioneer forest entomologists were storytellers. Long automobile rides and campfires tend to loosen tongues. I hope I captured some of the rich flavor of their reminiscences.

Oral histories—The oral histories of Keen and Hall are referenced in the text and available at the Forest Historical Society in North Carolina. However, I want to insert a caveat here concerning the accuracy of oral histories. Age may play tricks with one's memory, and sometimes long-forgotten slights or criticisms seem to resurface. As one example, in Keen's interview, he claimed Miller retired in 1943 when he took over as leader of the Berkeley Insect Laboratory. In fact, Miller worked for almost 9 more years as an independent scientist (or technical advisor) for the Bureau of Entomology in Berkeley. These were some of Miller's most productive research and publishing years. He even took over as lab leader in the occasional absences of Keen, as I recounted in the preface. Another point is that the contributions of others is sometimes forgotten. From 1943 until his retirement, John Patterson was the administrator of the Berkeley lab, and Robert L. Furniss of the Portland lab with Keen in overall charge. That this arrangement functioned so well was mainly due to the excellent leadership of Patterson and Furniss. There is not much in the oral histories on this aspect. I used the oral histories with caution, cross checking statements with other sources whenever possible.

Miller's diaries—Miller developed a daily dairy habit as soon as he joined the U.S. Forest Service. A daily dairy was required of forest officers, so his dairies started with his Forest Service appointment in 1909 and continued until his retirement. He actually kept two diaries for many of the years between 1910 and 1920. One diary tracked travel and expenses, and the second contained biological notes wherever he was working at the time. The early diaries contain more detail of his travel, mode of travel, and kind of work he was doing. As the years went by, the entries became very brief; for example, the Tuesday, May 23, 1950, entry is "Berkeley." For Saturday, November 18, 1950, the entry is "Stanford-Army game."

Unfortunately, the diaries do not go into administrative or personnel details, but from 1910 to 1940, they do faithfully record his travels, who he met with, and why. This information was valuable for relating Miller's work habits, his prodigious amount of travel, and the primitive transportation and living conditions in the field. The information also was used to crossdate reports on various projects.

There was one serious problem with his diaries. Many were small, 4- by 6-inch USDA field diaries, or even smaller stationery store diaries. Miller's handwriting was small and tight to begin with, and often he wrote even smaller to get all of his entry into the designated diary space for the day. Consequently, I had to read most of them by using a magnifying glass. Then to top it off, he wrote most entries in light pencil. But my complaints are trivial compared to the value of having 40 years of a person's daily journal when preparing his biography.

We can thank Miller's wife for keeping his letters and diaries and his son, Harold Miller, a career Forest Service forester, for recognizing their value, saving them after his mother died, and then entrusting them to his daughter, Susan Lowenkron when he died. Susan, in turn, entrusted the diaries to me in 2003.

Burke also kept a daily journal his entire life, according to grandson David Pratt. Unfortunately, Mrs. Burke thought her husband's diaries and correspondence should be kept private, so she destroyed them after he died.

Appendix

UNITED STATES DEPARTMENT OF AGRICULTURE, BUREAU OF ENTOMOLOGY, BRANCH OF FOREST INSECT INVESTIGATIONS, WASHINGTON, D. C.

TO OWNERS AND OTHERS INTERESTED IN THE PROTECTION OF THE PINE TIMBER OF NORTHEASTERN OREGON FROM DEPREDATIONS BY BARK BEETLES.

Extensive investigations carried on by experts of the Bureau of Entomology, assisted by officers of the Forest Service and interested owners of timber, have revealed the fact that a large percentage of the pine timber in northeastern Oregon has been killed during the past five years by an insect known as the mountain-pine beetle.

While heretofore this beetle has confined its principal depredations to the lodgepole pine, it is now gradually adapting itself to the yellow pine, thus threatening the best trees and stands of this timber on and adjacent to the Wallowa and Whitman national forests.

According to the conclusions and recommendations of the expert of the Bureau of Entomology in charge of forest insect investigations, based on the reports of the representatives of the Bureau, of the Forest Service, and of private owners, who have conducted special investigations to ascertain the facts relating to the technical and practical features of the problem, it is evident that unless the proper steps are taken to control the depredations, many millions of dollars' worth of the best yellow-pine timber of the area will be killed within the next few years.

It appears that it is not practicable to undertake at this time to control the depredations in the lodgepole-pine areas, but it does appear to be entirely practicable to control them in the principal yellow-pine areas in and adjacent to the eastern part of the Whitman and southwestern part of the Wallowa national forest at a cost of from $30,000 to $100,000, and thus prevent, within the next five or ten years, the further death of timber, which, judging from the history of similar depredations by this beetle in other sections of the Rocky Mountain region, is certain to be worth, in stumpage values, several millions of dollars.

The depredations in and adjacent to the yellow-pine areas are so extensive and the number of infested trees is so large that control work, if attempted with any prospect of success, with the limited funds that might be available from all sources and the limited number of laborers who could be secured for the work, must be by the methods of cutting and barking, and cutting and burning, the required number of infested trees at direct expense. It is also certain that unless there is a very general cooperation, by all of the principal owners and interests involved, in an energetic effort to carry on the work according to a plan of procedure definitely agreed upon and based on established principles and requirements, nothing of importance can be accomplished.

Extensive experiments with methods of controlling this class of beetles have been conducted, according to the requirements and instructions of the experts of the Bureau of Entomology, by private owners and by the Forest Service direct, or in cooperation with other interests, in five different areas in Colorado and two in Montana. All of these have been successful in controlling the depredations, and all have demonstrated conclusively that such work will pay, in the timber protected, an enormous profit on the money expended.

These demonstrations and experiments have also shown that if from 35 to 75 per cent of the infested timber in the principal centers of infestation within the radius of one or more townships is felled and barked or otherwise disposed of within the required period to kill the broods of insects in the bark, the remaining living timber will be protected from depredations for many years after.

The direct expense of cutting and barking and cutting and burning the infested trees has ranged from 15 cents to $1 per tree, or an average of about 50 cents per tree. Whenever the beetle-infested timber has been utilized within the required period, the desired control has been affected without ultimate cost. When the timber is felled and barked at direct expense, the merchantable timber thus treated is usually available for utilization for two or more years after it is cut, and the amount that can usually be sold and converted into lumber will yield enough revenue to cover a large percentage, and in some cases all, of the original cost.

The Bureau of Entomology has no funds that can be devoted to direct control work, but it will devote all

available funds and men toward locating the infested timber, directing the operation of marking the same for cutting, and giving technical advice and instructions on the essential features of the control work, provided it has sufficient assurance from the owners and others directly concerned that its recommendations will be adopted and carried out, so far as it is practicable to do so.

The Forest Service has given assurance that during the months of October and November it will devote all available funds, amounting to at least $5,000, to direct control work in an important center of infestation located by the experts of the Bureau of Entomology in the yellow pine on one of the national forests; also, that it will endeavor to secure a special emergency appropriation to continue the work next spring in the same or other centers, provided the principal private owners of affected or threatened timber in or adjacent to these centers will give similar assurance that they will cooperate in an attempt to dispose of the required proportion of the infestation on their property.

Therefore, if you are interested in the protection of the timber from further depredations by the beetle, are you willing to join the Forest Service in an organized cooperative effort to adopt and carry out the recommendations of the Bureau of Entomology for the treatment of the required percentage of infested trees and to take the necessary action relating to the infested timber which may be located and marked on the property in which your are directly or indirectly interested?

If the timber on the lands in which you are interested is found to be healthy, are you willing to contribute to a general fund to assist in the disposal of the important centers of infestation, which are found to be a menace to it?

Will you make an effort to attend, or have a representative of your interests attend, a meeting to be held at Baker City, Oregon, on September 1, 1910, to discuss and adopt a definite policy of procedure toward the protection of the timber of northeastern Oregon from insect depredations?

An early reply is important, in order that the Bureau of Entomology may judge whether or not it can proceed with its efforts to bring about the required action, or whether it will be necessary to abandon the project and turn its attention to other sections of the country in which similar depredations demand attention.

Correspondence relating to organization for cooperative control work and the general methods of procedure in such work should be addressed to the District Forester, Portland, Oregon.

Correspondence relating to the insect and methods and recommendations for control work should be addressed to Mr. H. E. Burke, Agent and Expert, Bureau of Entomology, Sumpter, Oregon.

A. D. HOPKINS,
In Charge Forest Insect Investigations.

Approved:
L. O. HOWARD
Chief, Bureau of Entomology.
AUGUST 5, 1910.

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Pacific Northwest Research Station

Web site	http://www.fs.fed.us/pnw
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