

# WOMEN IN MAMMALOLOGY: THE EARLY YEARS

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The first female mammalogists in the United States were collecting, studying, and even publishing on mammals for more than a quarter of a century prior to the establishment of The American Society of Mammalogists in 1919. Martha Maxwell, whose diorama of Colorado's wildlife became the most talked about exhibit at the nation's Centennial Exhibition in 1876 was the first true practitioner of modern taxidermy. Known to leading biologists of the day, her collections documented fauna of the West even as expansionism was causing it rapidly to disappear. Louise Kellogg was the first American woman to publish scientific papers on mammals. Interested in both fossil and Recent taxa, she and her companion of 40 years, Annie Alexander, explored western North America from Alaska to Baja California. The specimens they collected, and the notes and photographs they assembled, serve as an irreplaceable historical record of the flora and fauna of western North America in the first half of this century. As founder and benefactress of the Museum of Vertebrate Zoology, Annie Alexander's vision and commitment to the establishment of a research-based museum of natural history in California laid the foundation for a program of research, education, conservation, and collections management that has served as a model for similar museums nationwide. Knowledge about the lives of these extraordinary women provides a context for understanding and appreciating the achievements of all female mammalogists who have succeeded them.

Key words: Martha Maxwell, Louise Kellogg, Annie Alexander

On 13 March 1944, Viola S. Schantz, Treasurer of The American Society of Mammalogists and a zoologist with the United States Fish and Wildlife Service in Washington, D.C., wrote to E. Raymond Hall at the Museum of Vertebrate Zoology (MVZ), University of California, Berkeley. Inquiring from him as to who might be considered the first woman mammalogist in America, she wrote, "Assuming they mean one who has published on technical mammalogy, to my knowledge this honor should probably go to Miss Louise Kellogg, Susan, California. . . . [However,] If you know of any earlier ones I should appreciate knowing about them" (V. S. Schantz, MVZ Archives, 1944).

On 20 March, a week later, Hall replied, "I may say that I did not know of one who preceded Miss Louise Kellogg. However, I showed your inquiry to Mrs. Joseph Grinnell, and this morning she put in my mail

box the enclosed memorandum which cites an article published in 1890 in Volume I, No. 9, pp. 265–268 of 'Zoe.'" Written by the botanist, Katharine Brandegee, the article to which Hilda Grinnell referred was entitled, "Caenums of the Hare." Hilda's note to Hall then continued, "If it were not for the requirement of publication Mrs. Maxwell would undoubtedly rank as first woman mammalogist."

MARTHA MAXWELL

Although few today recognize her name or know of her accomplishments, those who visited the Centennial Exhibition in Philadelphia in 1876 were awed by her exhibit of Colorado birds and mammals entitled "Woman's Work." Hour after hour throughout the Exhibition that summer Martha Maxwell was besieged by questions from visitors and media correspondents (Dartt, 1879). Most pressing was their de-

sire to resolve the seeming disparity between the monumental exhibit they saw before them and the modest, delicate, and unassuming appearance of the woman who created it (Benson, 1986).

Martha was born in 1831 in Tioga Co., Pennsylvania. Her father died when she was 4 and for the next 5 years she was raised by her grandmother, Abigail. Abigail frequently took Martha on walks in the woods, familiarizing her with the plants and animals and imbuing within her a love of wild-life and nature. Being a strong-minded, independent woman, Abigail influenced Martha's way of thinking about life and about what women might hope to achieve (DeLapp, 1964). In the end, the attitudes that Martha gained from Abigail allowed her to persevere and to succeed, despite the many setbacks and disappointments she experienced (Benson, 1986).

Martha's mother remarried when Martha was 9 and the family moved west to Baraboo, Wisconsin. Josiah Dartt, Martha's stepfather, imparted to her a love of books and learning. Despite financial difficulties and the prevailing societal norms, Josiah encouraged Martha to attend college. In April 1851, at the age of 20, she left home to attend Oberlin College, the first school in the country to admit women to regular classes with men, and also the first to grant bachelor's degrees to women. Her first term included courses in Latin grammar and in arithmetic, as well as the required daily chapel. However, costs for tuition, room, board, and incidental expenses soon became prohibitive to her. Despite often working while enrolled, after little more than a year she could no longer pay her expenses and was forced to return home (Benson, 1986).

Back in Wisconsin, Martha enrolled at nearby Lawrence College (DeLapp, 1964). There she met and became friends with a daughter of James Maxwell, one of Baraboo's wealthiest citizens and a widower with six children (Bonta, 1992). Lonely, and at a loss as to how to manage his large

family without a wife, he soon proposed marriage. Martha declined the offer. She was barely older than some of his children and she was still unsure as to what she wanted to do with her life. However, at her stepfather's urging, she reconsidered the proposal and eventually assented, given the financial security it would afford her (Benson, 1986).

The loss of James' fortune a few years after their marriage meant that not only would Martha never know financial stability or security, but also that the need to support herself and her family would both motivate and plague her all the rest of her life. Although her passion for recreating the beauty of nature in extraordinary "sculptures" was driven by her artistic gifts and her scientific curiosity (Dartt, 1879), it was her basic need to make money that ultimately led her to the Centennial Exhibition in Philadelphia.

To provide financially for their family, which now included a 2-year old daughter, Mabel, Martha and James headed west for the gold fields of Colorado in late 1860 (Bonta, 1992). Mabel was left behind in Wisconsin. Upon arriving in Denver, Martha had a boardinghouse built, but that same year it burned down in a general conflagration that destroyed most of the town. With the small amount of savings she had accumulated before the fire, she bought some land and, the following spring, she and James moved to a cabin on the property. However, upon leaving the cabin for a few days, their claim was jumped by a German taxidermist. When Martha returned to the property to talk with the man and resolve their dispute, she was struck by his collection of stuffed birds. Fascinated by the specimens she saw, she asked him to teach her the process by which they were made. Here, she realized, was a way to couple her need for artistic expression with her love of nature (Benson, 1986; Dartt, 1879).

Although the German agreed to give her lessons at \$10 apiece, provided she would not practice the art in Denver, when she re-

turned the next day to begin study he refused, stating it was “because she was a woman!” (Dartt, 1879). He believed that women were better with their hands than men, and he feared the competition that might result from her work (Dartt, 1879; DeLapp, 1964). However, Martha remained intrigued by the lifelike mounts and, not easily dissuaded, she wrote to her family asking that they send her books on the subject of taxidermy. Bonta (1992:34) wrote, “No longer would she be lonely for the company of other women—she could spend her time studying and collecting the wild creatures of Colorado, and she would educate humanity by displaying them in all their diversity.”

However, before she began this new career, Martha returned to Wisconsin to be with Mabel. Still having much to learn about the art of taxidermy and again being in need of money, Martha got work at the newly established Baraboo Collegiate Institute. Her job was to assist in the preparation of mounted specimens of birds and mammals for the Zoology Department (Dartt, 1879). There she acquired the skills needed when, 5 years later, she returned to Colorado to observe, study, collect, and prepare taxidermic mounts of the wildlife of the state.

It was at this time that Martha began to correspond with the leading biologists of the day. She wrote first to the Secretary of the Smithsonian, Joseph Henry in 1869 about textbooks that might be useful for specimen identifications (Benson, 1986). In his reply, Henry offered the assistance of Smithsonian curators. Her subsequent interactions were mostly with Robert Ridgeway and Elliot Coues (Benson, 1986). Ridgeway paid Martha for specimens she collected for him in the new Territory of Colorado and in other parts of the West. Later, he named a new subspecies of screech owl for her, based on a specimen she shot in her yard and then sent to him for identification (Benson, 1986). Martha is also credited with confirming the existence of the black-footed

ferret, an animal that had been described by Audubon many years earlier, but had been lost sight of until just before the Exhibition when a few specimens had reached the Smithsonian (Dartt, 1879).

Although her relationship with her husband became increasingly strained and her daughter did not share Martha's enthusiasm for the hardships of camping and collecting, James, Mabel, or friends of Martha frequently would accompany her on field trips to observe and collect animals (Dartt, 1879). Equally often she went alone. Her enthusiasm for her work, and for obtaining the necessary specimens, knew few if any bounds. Many years later her husband James would admit that Martha was as good a shot as any man, a skill she had first learned from her stepfather, Josiah, when she was just 13 (De Lapp, 1964).

Martha's collections eventually grew so large that they no longer could be contained in her small house and in the workshop she maintained at the mouth of Boulder Canyon. In an effort to solve this problem, as well as to try to earn more money for Mabel's college expenses, she opened a museum (Dartt, 1879). Although her work was becoming well known in Colorado, the museum unfortunately did not attract sufficient visitors to turn a profit, even when relocated to the more populous Denver (Dartt, 1879).

At about this time, Colorado began to make plans to participate in the 1876 Centennial in Philadelphia. Martha's state-wide reputation prompted the Legislature to ask her to display her collection as part of their pavilion (Dartt, 1879). They could not afford to pay her a salary, but they did offer to reimburse her for the cost of transporting the specimens across the country and back again. Martha agreed, hoping that she would make money by selling postcards and minerals at the Exhibition (Dartt, 1879).

Reviews of Martha's exhibit at the Centennial appeared in magazines and newspapers nationwide and attest to the realistic quality of her work (Dartt, 1879). Her pan-

orama included the smallest birds and the largest mammals from Colorado, all of which she had collected and mounted herself. The specimens were grouped in a diorama of naturalistic surroundings that included running water (from a hose she had hidden in the background), boulders (artificially constructed), and vegetation (she brought with her), all arranged against a backdrop (she had painted) of expansive vistas of the West (Benson, 1986; Dartt, 1879). Although seemingly conventional by today's standards, the exhibit was clearly the first of its kind in the nation and created an extraordinary stir. Visitors bent to drink water from her stream and remarked on the movement of animals they were sure they had observed (Dartt, 1879). Benson (1986) commented that what is noteworthy about Martha's work is not the fact that it was being done by a woman, but merely that anyone was using such sophisticated techniques at that time, particularly someone living in an isolated town at the base of the Rocky Mountains.

Coues and Ridgeway visited the Exhibition and prepared annotated lists of its mammals and birds, respectively. These were then published as an appendix to a book written by Martha's sister, detailing how the exhibit was prepared (Dartt, 1879: 217). Coues wrote in his introduction to the mammal list,

"I was glad to see a collection of our native animals mounted in a manner far superior to ordinary museum work, and to know that there was at least one lady who could do such a thing, and who took pleasure in doing it. While the collection embraced several specimens of high scientific interest, I regarded it as one of the most valuable single collections I had seen . . ."

In the same volume Ridgeway wrote,

"It illustrates very fully the avian fauna of Colorado, while it bears testimony, not only to the great richness and variety

which characterize the productions of the new State, but also to the success which has crowned the enthusiastic and intelligent efforts of a 'woman Naturalist.'"

In his review of Mary Dartt's book, the noted naturalist J. A. Allen (1879:113) remarked,

"This exhibit was not only unique and effective in execution and arrangement, but was a startling revelation of what a woman can do in one of the most difficult fields of art, for not only were these objects prepared by Mrs. Maxwell, but all were procured by her, a large part of them having been taken by her own hands. But Mrs. Maxwell is something more than a successful and enthusiastic taxidermist; she is an ardent and thorough student of nature, and her explorations of zoology of Colorado have revealed the existence of many species in that State not previously known to occur there, and contributed many new facts regarding the habits and distributions of others."

Unfortunately, neither Martha nor her collection profited from their appearance in the Centennial Exhibition. When it ended, she did not have enough money to ship the collection home and the Colorado Legislature refused to honor its promise to pay transportation costs. The collection was then moved to Washington, D.C., and later to Saratoga, New York, where part of it was destroyed by fire under somewhat mysterious circumstances. The remainder eventually disintegrated owing to poor storage and inadequate protection from the elements (Henderson, 1915).

Martha, by this time voluntarily estranged from her husband and involuntarily so from her daughter, spent the remainder of her life on the east coast literally struggling to survive. Not until near the end of her life was Martha able to accept that Mabel was not interested in the career to which she, herself, had devoted her whole life and for which she had made such great sacrific-

es. When acceptance finally came, and when she realized that her precious collection would never be salvaged nor her dream of a museum ever realized, Martha lost the tremendous energy she had summoned throughout her entire life and which had made her survival possible. She soon became seriously ill. Mabel, who believed that her mother had essentially devoted a lifetime of energy, love, and money solely to the creation of her collection, traveled east to be with Martha at the end (Benson, 1986). Martha died on 31 May 1881, shortly after Mabel's arrival, reportedly a victim of blood poisoning from an ovarian tumor (Bonta, 1992).

Eventually, Mabel would describe her mother as someone with an unusual quality of mind, i.e., scientific curiosity combined with artistic gifts (DeLapp, 1964). More than half a century later, when her collection was no longer a visible reminder of her contributions to natural history, the woman Hilda Grinnell cited as the first female mammalogist was once again remembered in a brief article in the *Journal of Mammalogy* entitled, "Mrs. M. A. Maxwell, a pioneer mammalogist" (Schantz, 1943).

#### LOUISE KELLOGG

If Martha Maxwell was technically the first female mammalogist, Louise Kellogg is no less deserving of that title given our current view of the discipline. Yet the circumstances of their lives could hardly have been more different. Born 27 August 1879 in Oakland, California, <2 years before Martha's death, Louise was the youngest of five children born to Charles Winslow Kellogg and his wife, Anita. The family lived in an affluent part of Oakland in a home built by her grandfather, James Putnam Flint, who had come to California from New England during the gold rush in 1849. In association with east coast merchants, Flint established a line of clipper ships, which carried goods from Boston to the Bay Area (A. Q. Howard, pers. comm.). Among others in their neighborhood were

author Jack London, architect Julia Morgan, philanthropists Jane and Peder Sather, financier Wallace Alexander, and his sister Annie (Bamford, 1931).

After high school, Louise attended the University of California, Berkeley, and graduated in 1901 with a degree in classics. Her life was filled with the many activities that occupied young women of her age and social class, but she participated in other activities that were less common for women at that time as well (A. Q. Howard, pers. comm.). Louise's father, Charles, was an officer of Tubbs Cordage in San Francisco and a founder of the Cordelia Shooting Club, the first duck club in California (Ryder, 1954). It is from him that Louise learned how to shoot a gun and how to fish. She excelled at both, but fishing became her passion.

It is not clear when Louise's interests turned more broadly and seriously to zoology and paleontology. It is possible that she was influenced by other family relatives as well. A history of Alameda Co., California, records that her uncle, Edward P. Flint, had interests that were not confined solely to his mercantile trade. Records show that the Oakland Public Museum was started in 1907 with the purchase of an ornithological collection "through the efforts of Bertha Chapman, an Oakland school teacher, and E. P. Flint." (A. Q. Howard, pers. comm.). However, there is no indication that while growing up, Louise had any sense that the discipline of natural history would figure prominently in her life or that she, in turn, would contribute significantly to it.

On 16 April 1908, Annie Alexander, founder of the Museum of Vertebrate Zoology, wrote to Joseph Grinnell, its first director, on the eve of her departure for Alaska, "I've decided to take a lady with me on the Alaska trip if I can find the right one. I don't want my collectors to suffer any unpleasantness from talk on my account. Do you know of anyone among the members of the Cooper Club or elsewhere who

would meet the requirements?" (BANC, 67/121c, in litt.). Grinnell's response to this inquiry exhibited what Annie described sharply in her reply as "his evident contempt for women as naturalists" (BANC, 67/121c, in litt.). However, a week later, Annie wrote again to Grinnell, "I have a little friend going with me after all who wants to learn how to put up specimens and to take notes. She will be with us two months. She is a dandy girl but I never dreamed her folks would let her go when I half jokingly asked her to join us. . . ." (BANC, 67/121c, in litt.).

With a 13-year age difference between Annie and Louise, it is reasonable to assume that the women may not have been well-acquainted prior to Annie's visit to the Kellogg home one evening in April 1908. But the visit is recorded in Louise's personal diary and ca. 1 week later the two women were on a ship together sailing north.

Louise's trip to Alaska in 1908 with Annie Alexander was the beginning of a 40-year relationship that ended only with Annie's death in 1950. It is impossible to assess how Annie's life, and thus her contributions to natural history and to the University of California, would have been different had she not met Louise. On 6 August 1908, Annie wrote to her childhood friend, Martha Beckwith, from Alaska,

"Louise took the steamer yesterday for home to be ready for her school duties—a long journey for her to take alone, nearly two weeks but I couldn't make up my mind to go back to plain life in Oakland with new birds to collect luring me on and all the fascinations that this sort of gypsy life has for me—yet the greatest discovery of this trip was Louise. Surely I was fortunate but the more forlorn now to be left alone with the lapping of the waves on the beach and the rain on my tent roof" (BANC, 73/25c, in litt.).

Subsequently, the team of Alexander and Kellogg travelled and collected annually, not only in California, but throughout west-

ern North America and abroad. As companions and collecting partners, they contributed over 34,000 fossil, plant, and animal specimens to the University of California's natural history museums. Many represented taxa that were new to science or were range extensions for known species. That Louise's predilection to this out-of-door life can be traced to her father is evidenced perhaps in a letter that Annie wrote to Martha in December 1910. She wrote,

"We have been off trapping only twice since getting home. Mr. Kellogg takes us once a year duck hunting in the Suisan marshes and it is always a treat to go. . . . The slough winds in and out among the tules full of red-winged black birds, tule wrens, song sparrows and yellowthroats—quite a little world by itself. . . . we stayed over night and set out some traps catching one interesting little mouse that is confined entirely to the salt marsh grass—saliconia. We have since set out traps near Alameda and caught another species of the little mouse—we have visions of getting a horse and wagon and putting in a week collecting around the Bay as there is much to be done right near home" (BANC, 73/125c, in litt.).

The women's love for Suisun Bay and the accompanying slough resulted in their purchase of a farm on Grizzly Island, Solano Co., California, in autumn 1911. Because the area was remote and undeveloped at that time, the farm and its environs proved a rich locality for new records of both birds and mammals for many years (MVZ accession records).

While work on the farm occupied a great deal of their time and energy, the women continued to collect specimens annually for the MVZ from throughout the West. On 8 January 1911, Annie wrote to Martha, ". . . let me unfold to you a plan which after due consideration seems about as undertakeable as I at present seem to have ambition for. It is zoological of course but concerns problems right near home which are after all the

most interesting. The region selected is northern Trinity County, about 80 miles due west of Fall River Mills which you remember. A high and rather isolated range of mountains forms the northern boundary. No biological survey has ever been made of the section. The problem that appears to be of the most interest is the relation of the mammals of the moist coast belt with those of the drier interior and their distribution. At least three faunal zones are represented in the region, so that cross-section work promises to be very attractive. Louise is to work up the mammals which is an incentive to do the best we know how" (BANC, 73/25c, in litt.).

In 1916, 5 years after she and Annie embarked on field work in the Trinity Mountains in northern California, Louise published the last of her six papers, entitled "Report upon mammals and birds found in Trinity, Siskiyou and Shasta counties, with description of a new *Dipodomys*" (Kellogg, 1916). However, it was her first paper, a description of the rodent fauna of late Tertiary beds at Virgin Valley (Kellogg, 1910) that is perhaps more noteworthy. It is only the second paper in mammalogy known to have been authored by a woman (the first was Brandegee's, noted above), and its publication pre-dates the founding of The American Society of Mammalogists by 9 years. This was followed in 1911 by two publications, one on fossil and one on Recent mammals (Kellogg, 1911a, 1911b). In 1912, Louise published a paper on Pleistocene rodents (Kellogg, 1912), and in 1914, a description of a new mountain beaver from the Trinity region in northern California (Kellogg, 1914). Finally, her publication summarizing the field work that she and Annie had done in the Trinity Mountains appeared in 1916 (Kellogg, 1916).

The magnitude of their achievements cannot be captured in a brief review such as this. Both loved the desert and the mountains and they often were gone for months at a time, camping in all seasons. Often they

would collect in late autumn or early winter, seasons when it was difficult for members of the Museum staff to get away. Typical of the pattern of their lives for 40 years, Annie wrote to Martha in February 1911, "Meanwhile Louise and I are off Friday of this week for the mountains in quest of mammals in winter pelage and what desirable birds there are to be found . . ." (BANC, 73/25c, in litt.).

Testimonials to the importance of their collections to the discipline of vertebrate natural history and to our understanding of vertebrate diversity and evolution abound in hundreds of letters in the University and Museums' archives at Berkeley. One example is the following, written to Annie by E. Raymond Hall, 23 February 1932,

"One result of your past summer's collecting is the accompanying account of a new species of shrew. It seems remarkably distinct from anything yet found—even from the two other species in the same group. The group to which it belongs is the least known of any in the genus *Sorex*. Of the eight specimens previously known, only one has been taken at a place (*sic*). I include a little sketch map (copied from Dr. Jackson's monograph) of their distribution. You will note that with the specimen from Chiatovich Creek, taken in 1927 by Miss Kellogg, you two have four of the eleven known specimens to your credit. Try as I have in Nevada, I haven't taken a single one. Unless you divulge the secret of your success, my envy will lead me to insist that it's pure luck on your part!" (BANC, CU-120, in litt.).

By 1939, the MVZ was firmly established as a major research center on the west coast. Its collections were significant in size and scope and Louise and Annie were advancing in age. After Grinnell's death in May of that year, the women shifted their emphasis from trapping mammals and birds to collecting plants for the University Herbarium. Such an eclectic ap-

proach to natural history was characteristic of all the first women mammalogists. These women were naturalists first and mammalogists second. Their interests and dedication centered on their desire to understand and appreciate nature in its entirety. Emphasis might be placed on one discipline relative to another, but never to the exclusion of others. Organisms existed together in nature and the study of any one group logically extended to that of any other as the occasion and opportunities arose. For Louise and Annie, the desire to understand relationships among living organisms extended back in time as well, thousands and even hundreds of millions of years. Their interest in fossil history and in vertebrate evolution resulted in their donation of thousands of specimens of fossils to the Museum of Paleontology at the University of California in addition to all of the specimens of Recent mammals and birds that they collected for the MVZ.

Following Annie's death in 1950, Louise continued to collect plants, often accompanied by other women botanists from the University. In particular, she funded and participated in botanical collecting trips to Baja California between 1948 and 1953 (Carter, 1987). Her last field trip to Baja California was in 1960 when she was 80 years old. At least one taxon of bird, *Lagopus rupestris kelloggae* (Grinnell, 1910), and one species of plant, *Acacia kelloggiana*, were named in her honor (Carter, 1987). Her achievements are perhaps best summarized in a single sentence taken from her obituary in the San Francisco Chronicle, 15 December 1967, "... Louise Kellogg, a distinguished and intrepid naturalist who explored the Western wilderness from Alaska to the tip of Baja California for more than half a century." This she was, and much more. She was, truly, the first woman mammalogist as we think of such a person today.

#### ANNIE MONTAGUE ALEXANDER

It is impossible to assess how Annie Alexander's life, and her contributions to nat-

ural history, would have been different had she not met Louise Kellogg, her companion of 40 years. It is equally impossible to imagine the career of Joseph Grinnell or to discuss his achievements, had he not met Annie M. Alexander. It was Annie's vision, commitment, and money that created the Museum of Vertebrate Zoology at the University of California, Berkeley, it was Annie who selected Grinnell as its first Director, and it was she who provided the environment in which Grinnell would ultimately prosper.

Annie Montague Alexander was born 29 December 1867 in Honolulu, Hawaii, the oldest daughter of Samuel Thomas and Martha Cook Alexander. Although the granddaughter of missionaries to the Islands, her father and her uncle, Henry Baldwin, were businessmen and partners who pioneered the growing of sugar cane on the island of Maui. Their success in the sugar business led to the establishment of Alexander and Baldwin Shipping Lines and left each of their children with personal fortunes.

Annie inherited her father's energy and his love for adventure and the out-of-doors (Grinnell, 1958), and it was from him that she learned to shoot. She was equally adept with gun and camera. From her father she also learned how to read a balance sheet and *Barron's Financial Weekly*.

In 1882, the family moved to Oakland, California, a move that never suited Annie. She loved Hawaii and returned there almost annually throughout her life. She attended public school in Oakland and then was enrolled for 2 years at La Salle Seminary for Girls in Auburndale, Massachusetts, although she never earned a degree. In 1888, the family toured Europe and, when they returned home, Annie remained in Paris to study art. However, plagued by eye strain that the doctors said threatened her with blindness, she gave up art and returned to Oakland. Nursing school had much the same result on her eyes, but a series of operations in which the muscles of her eyes



were cut left her seeing somewhat better. It also left her with the realization that she would never be able to do any sort of close, detailed work.

In 1904, Annie, her father, and a family friend walked ca. 850 miles across Africa on safari. The purpose of the trip was to collect wildlife, both on film and as trophies. Tragically, both her father and their friend perished during the trip (Anonymous, 1992). Although, it was her father's death that ultimately served as the catalyst for Annie's idea of creating a museum, other seemingly unrelated events influenced her decision as well.

In autumn 1900, Annie began attending paleontology lectures at the University of California being given by Professor John C. Merriam. In spring 1901, she wrote to Merriam expressing her desire to collect fossils. His response was to guide her in organizing a research expedition to Fossil Lake, Oregon. The trip was, by all accounts, a success. She wrote afterwards to her childhood friend, Martha Beckwith, "It's lucky I've promised my summer collections to the University. The fever for amassing these strange treasures might make of me a collector of the most greedy type. . ." (BANC, 73/25c, in litt.).

While continuing to both make and finance fossil expeditions in each succeeding year, the idea for a museum gradually took hold in Annie. In a letter of condolence to Hilda Grinnell following the death of Joseph in 1939 she wrote, "As you may know the death of my father in 1904 when we were in Africa together was a terrible shock to me. I felt I had to find something to do to divert my mind and absorb my interest and the idea of making collections of West Coast fauna as a nucleus for study gradually took shape in my mind" (BANC, 73/25c, in litt.). Her passion for collecting, coupled with a chance encounter in 1905, combined to determine the future direction of her life and insure her impact on the discipline of vertebrate natural history.

At a dinner party in October 1905, Annie

met for the first time a man with whom she had previously corresponded, C. Hart Merriam, Director of the National Biological Survey in Washington, D.C. As the evening wore on their talk turned to collecting mammals in Alaska, bears in particular. On 22 February 1906, Annie wrote a seven-page letter to Merriam solidifying her plans for collecting in Alaska that summer. In addition to listing the species she wanted to collect, and to inquiring about permits and the hiring of collectors to help her, she wrote, "My object in making this collection is to form the nucleus for a collection representing the fauna of the Western coast. I would like to keep it in my own hands for at least three years, if it could be possibly arranged" (BANC, FILM 1958, CHM correspondence, reel 28, in litt.).

C. Hart Merriam responded positively to her letter on 1 March and began, "My dear Miss Alexander, Your letter of February 22 touches at several points a subject which I have been thinking of for a number of years—very acutely during the past year or two. I refer to the pressing need of a natural history museum on the Pacific Coast" (C. H. Merriam, MVZ Archives, 1906, in litt.). His encouragement to her to undertake this venture went on for an entire page.

The realization of the need for a collection of Recent vertebrate animals at the University of California likely came to Annie through her paleontology lectures with John C. Merriam. To properly identify fossils and to understand the evolution of different groups she knew it was necessary to compare fossil specimens with their closest living relatives. In addition, she saw that knowledge about the distributions and habits of Recent species of vertebrates often could be extended and applied to the understanding of their fossil relatives.

On 28 October 1907, Annie wrote to then President of the University of California, Benjamin Wheeler, with her proposition for founding a research museum of Recent specimens of vertebrates on the Berkeley campus. In exchange for the University

erecting a galvanized iron building to house the museum, Annie guaranteed the expenditure of \$7,000 yearly for 7 years for "... field and research work relating exclusively to mammals, birds, and reptiles of the west coast, with the understanding that the University of California would be in no way responsible for the management of the funds for carrying out the work, or selection of collectors. It would be understood that all natural history material thus collected and housed within the walls of the above-mentioned building would become the property of the University of California except such as might be loaned by friends of the University" (BANC, CU-5, in litt.).

After two additional paragraphs she continued, "It is understood that only such collectors would be selected as would reflect credit to the University of California. The man I have in mind to take charge of the work and act as curator should my proposition be accepted is Mr. Joseph Grinnell of Pasadena, Calif. . . ."

Annie had met Grinnell somewhat serendipitously through her connection with C. Hart Merriam. In looking for field biologists to accompany her to Alaska, she had asked Merriam for recommendations. He, in turn, recommended a Mr. Stephens in San Diego, who in turn suggested she interview Joseph Dixon in Pasadena, a student of Grinnell's at Throop Institute (known today as Cal Tech). In seeking out Dixon on campus, Annie inquired of Grinnell as to Dixon's whereabouts. Learning of her reason for wanting to find Dixon, Grinnell invited Annie to his home to show her his private collection of specimens, part of which had been accumulated during the 2 years he had spent doing field work in Alaska (Grinnell, 1940).

In Grinnell, Annie found a naturalist who shared her vision, as well as someone with museum experience. The vision they shared centered around the desire to develop a major scientific collection and research museum on the west coast, "a center of authority" (BANC, C-B1003, in litt.) as they

would come to refer to it. Through her love of nature and the out-of-doors, Annie already realized that the fauna of the west coast, and of California in particular, was rapidly disappearing, succumbing to the ever-increasing population in the State. If a complete and accurate record of the fauna was to be made for posterity, work would have to begin at once. She also hoped that her museum, and the research it sponsored, would stimulate interest in natural history among the general public, and that public education, in turn, would lead to conservation. And last, of course, was her understanding of the importance of such a research collection for the paleontologists at the University. Although not discussed in this review, Annie also founded and endowed the University of California Museum of Paleontology (UCMP) on the Berkeley campus. Paleontology was her first, and would remain, her lifelong passion.

Annie was not a scientist and did not claim to be one. She was, however, quite knowledgeable about science and interested in financially supporting research. She subscribed to numerous magazines and journals, including *Science*. She was a Life Associate of the American Ornithologists' Union, the Cooper Ornithological Society, the Society for Vertebrate Paleontology, and both a Charter Member and the first female Life Member of The American Society of Mammalogists (Kaufman et al., 1996).

She and Grinnell corresponded weekly, often daily, and he consulted with her on every penny expended, every staff member hired, every research project undertaken. He regularly sent her samples of correspondence he received so that she might know the day-to-day business of the Museum. He also sent her copies of all papers published by the Museum staff and students. Together they designed every detail of the Museum, e.g., its name, specifications for the specimen cases, the catalogue cards, the ink to be used in writing on the cards, the exacting manner in which field observations were to

be recorded (BANC, C-B1003, 73/25c, 67/121c, in litt.).

Annie's commitment to her museum can be found in her steadfast support of its work, both monetarily and through enlarging its collections. She loved field work and she and Louise contributed >16,000 specimens to the Museum through their own efforts, and many thousands more through monies Annie made available to other collectors. In addition to collecting during seasons when it was difficult for members of the Museum staff to get away, the women often would provide specimens of particular interest or need for student research projects or for which there were gaps in the collections (Grinnell, 1958). Annie's love of camping is perhaps best expressed in this oft-quoted excerpt from her 1905 field notes, "People naturally count it among their blessings to have a roof over their heads at night, but how oppressive this roof seems to you, and the four walls of your room after a month or two in the open!" (UCMP Archives; reprinted in Zullo, 1969.).

Alexander and Kellogg collected not only in California, but throughout the western United States, in Mexico, and abroad. The collections they amassed were significant in many respects. Not only were their specimens meticulously prepared, their field notes were detailed and often accompanied by photographs of the habitat and by vegetation samples. On 17 July 1931, Grinnell wrote to Annie about her recent collection, "The three lion skulls are of especially high value; for previously, we had just one lion skull from Arizona—that from the Colorado River a little above Yuma and representing, I think, a different race from that represented by yours. Your letters, describing so vividly the country through which you pass, are full of just the right kind of information needed for permanent record in connection with the materials you are gathering" (BANC, CU-120, in litt.).

Although she was providing a monthly stipend for the running of the Museum and its operations, almost all expenses for field

work were paid by her over and above that pledge. In 1919, she solidified her financial commitment by endowing the Museum. Annie's disdain for attention and publicity are almost legendary. This gift, as with all those that she would give to the University, she requested be placed on the books as a gift from "a friend to the University." In 1934, Annie doubled the size of her endowment, at the same time continuing her generous funding of field work for the Museum over and above its allotted stipend.

In her honor, and in recognition of her contributions to the field, two new species of birds (*Lagopus alexandrae* Grinnell, 1909; *Sitta carolinensis alexandrae* Grinnell, 1926) and two of mammals (*Ursus alexandrae* Merriam 1914; *Thomomys alexandrae* Goldman, 1933), as well as several species of plants and fossils, were eventually named for Annie. In naming a new species of pocket gopher, E. A. Goldman (1933) wrote, "The species is named for Miss Alexander whose own faunal investigations and generous support of the studies by others have contributed greatly to knowledge of the mammals of western states." However, when E. Raymond Hall, then Curator of Mammals of the Museum, sent Annie a manuscript he had written in which he described a new species of shrew he wished to name for her, calling it *Sorex alexanderi*, she responded, "We were much interested in your description of the new shrew from Arizona (shall we not call it *Sorex grahamensis* for you know my aversion to having things named after me)." He did as she requested (BANC, CU-120, 1932, in litt.).

Whereas her interest and devotion to the Museum she created never wavered, after Grinnell's death in 1939 collecting expeditions in search of small mammals essentially ceased. She was 72 at this time. Instead, she and Louise shifted focus and began collecting plants. Together they contributed over 17,000 specimens to the collections of the University Herbarium.

While seemingly always frail in stature,

Annie was in actually quite robust. In response to a letter from Grinnell in 1932 where he mentioned receiving a valuable collection for the Museum, Annie replied concerning the donor, "it is inspiring to know he is still been on collecting—at the age of 62! Tell him for me, being 64, that I consider the sixties a very appropriate period in one's life to do field work—an out-of-doors quest that always will have, I believe, a certain charm and excitement about it" (BANC, CU-120, in litt.).

Annie knew every Museum student by name and was familiar with each of their research programs. However, she seemed particularly pleased when female graduate students were first accepted into the Museum program. In 1933, she and Louise took the first female graduate student in the Museum with them on a 3-month collecting trip to the Palm Springs area, along the Colorado River, and then into Arizona. Eight years later, and 2 years subsequent to Grinnell's death, Annie sent a check to Hilda Grinnell so that she might take a group of female graduate students on an expedition. Grinnell had not permitted women to go on field trips (W. C. Russell, pers. comm.). This Annie did again in 1942. Of these opportunities Hilda wrote to Annie several years later, "Those trips are going to bear dividends in the lives of the girls through all the years to come, but I do not see how they could mean more to them than they have, and will have, to me. I had felt so hopelessly cut off from the out of doors and you opened the way again for me in such a wonderful manner. I shall always be grateful" (BANC, 73/25c, in litt.).

In 1947, Annie and Louise made their first collecting trip to Baja California. The women were gone for 3 months and Annie celebrated her 80th birthday on the trip (Carter, 1949). Unfortunately, it was also the last major expedition that the two women made together. In October 1949, Annie became seriously ill. She died 10 September 1950 at the age of 83.

Of her passion, she wrote to the botanist,

Willis Jepson, in 1944, "You ask what my objective is in making such painstaking collections. Well, I'm just a born collector and it is an excuse to get off into the mountains" (A. M. Alexander, UCH Archives, in litt.).

Grinnell, Merriam, and others frequently attested to the profound contributions that Annie Alexander made, both to the University and to science. They acknowledged her in the books and papers they published and in their correspondence with her. In December 1936, Grinnell wrote to Annie, "Again have decisions and appropriations on your part energized projects which, with small margin of hazards, carried out, will bring 'repercussions' of a beneficial sort far, far into the future. I don't know of any sort of investment that is any more promising than in *intellectual* directions" (Grinnell, 1958).

#### CONCLUSIONS

Although my original intent was to survey the history of women in the Society during its first 2 decades (Kaufman et al., 1996), I soon realized that any discussion of that period would be greatly diminished without knowledge of the lives of the extraordinary women detailed above, women whose lives and achievements fell outside the realm of traditional academia and the professional societies it fostered. For those previously unfamiliar with the lives of these women, it is my hope that these biographical sketches have illuminated the diversity of our roots and our contributions to this discipline and that they will provide a context for recapturing our history—as women, as mammalogists, and as members and full participants in The American Society of Mammalogists.

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trast, the majority of biographical information on Louise Kellogg and Annie Alexander was derived from my own research as no definitive works exist for these women. Hilda Grinnell's biography of Annie Alexander deserves acknowledgment, but in the end it has served primarily as a point of departure for my own investigations, which focused on original correspondence in the archives listed below. I am also most grateful to Alice Q. Howard for the Kellogg family history she has meticulously compiled and for the notes and diaries of Louise she has generously shared with me. My thanks also to S. B. Benson, J. T. Gregory, A. K. Pearson, O. P. Pearson, F. A. Pitelka, V. M. Russell, W. C. Russell, C. G. Sibley, R. C. Stebbins, L. C. T. Stone, S. P. Welles, and other denizens of Berkeley, both present and past, who were fortunate enough to have known, or at least to have met, Annie Alexander and Louise Kellogg, and who spoke with me or recorded their recollections on paper. For archival materials relating to Annie Alexander and Louise Kellogg I acknowledge the correspondence files of the Museum of Vertebrate Zoology (MVZ), the University of California Museum of Paleontology (UCMP; C. Bell), the University of California and Jepson Herbaria (UCH; B. Ertter), and the archives of the Bancroft Library (BANC) on the Berkeley campus. Although many individuals have encouraged me in my research of Annie Alexander I acknowledge and thank Karen Klitz in particular.

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