

# Memorial to Charles Warren Merriam 1905-1974

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Charles Warren Merriam was born at Berkeley, California, on July 6, 1905, one of three sons of John Campbell Merriam and Ada Little Merriam. His older brother, Lawrence Campbell Merriam, majored in forestry at the University of California in Berkeley, and spent much of his professional career with the National Park Service. His younger brother, Malcolm Landers Merriam, is an economist who worked with the U.S. Department of Commerce, and after World War II he spent some time with the Brookings Institution. Their father was a distinguished professor of paleontology at the University of California, and in 1920 he became president of the Carnegie Institution in Washington, D.C. Charles had the advantage of being raised in an intellectual environment, and this was reflected in his

later professional work in invertebrate paleontology, stratigraphy, historical geology, and structural geology.

During his high school days in Washington, D.C., Charles became acquainted with members of the geological and zoological staff at the National Museum, and this may have had some bearing on his eventual selection of geology for a professional career. In 1923 he started his undergraduate studies at Berkeley, selecting premedicine as his major interest, but later he changed his major to zoology and received the A.B. degree in that subject in 1928. I first met Charles in 1925 when he was a student in an elementary course in mineralogy under my guidance. This was the beginning of our long association, involving some participation on my part in his field studies in central Nevada. Charles died on July 7, 1974.

In the summer of 1928, Charles had a rewarding experience as Assistant Park Naturalist in Grand Canyon National Park, and on his return to Berkeley he began his graduate studies in paleontology and geology. His thesis problem was a study of the fossil *Turritellas* from the Pacific Coast region, and from 1930 to 1931, he was a Le Conte Fellow which provided support for comparative studies of the Tertiary fossils in the Paris Basin. The genus *Turritella* is one of the most abundant and highly diversified molluscan genera found in the marine deposits of the Pacific Coast region, and each subspecies had a short vertical range from mid-Cretaceous to Holocene. The limited stratigraphic distribution made them of great value as zonal and horizontal indices. Charles spent four years in the preparation of the *Turritella* treatise, based on his free access to the large fossil collections at the University of California at Berkeley, the U.S. National Museum, Stanford University, and the California Academy of Sciences. He received the Ph.D. degree from the University of California in 1932, and the treatise on the fossil *Turritellas* was published in 1941.

During the academic year 1932-1933, Charles was an instructor in paleontology and stratigraphy at the University of California, substituting for Bruce L. Clark, who was on leave. During this period his interest shifted from the Tertiary fossils of the Pacific

Coast to the Paleozoic history of Western America. The western Cambrian faunas were well known because of the studies of Charles D. Walcott, but the younger systems were largely untouched. Early work by various expeditions centering around the Eureka mining district resulted in Walcott's systematic list of fossils published in Hague's U.S. Geological Survey Monograph 20. Subsequently, few stratigraphic and paleontological studies had been made. In 1932 Charles started reconnaissance studies of the Devonian rocks in California and Oregon; he found that these were highly disturbed, but in central Nevada, the middle Paleozoic beds are locally well exposed, continuous, and not badly disturbed or metamorphosed.

In 1933, Edwin Kirk suggested that the Devonian strata of Nevada presented many interesting problems, and Charles received a Penrose Research Grant from the Geological Society of America to start field work in 1934 and 1935 in central Nevada. A continued grant supported further studies from 1939 to 1942. Sheridan A. Berthiaume participated in the early phase of the study, in which sections of the Devonian and adjacent rocks were measured by instrumental survey. This was followed by some reconnaissance mapping, particularly in the eastern portion of the Roberts Mountains quadrangle (approximately 30 miles north of Eureka). In 1935 Charles was made instructor in geology and paleontology at Cornell University, which enabled him to continue his Nevada field activities during the summer months, resulting in his report on the Devonian stratigraphy and paleontology of the Roberts Mountains region as Geological Society of America Special Paper 25.

As Charles continued his field studies in the Roberts Mountains quadrangle, he confirmed Edwin Kirk's early suggestion that Ordovician strata containing volcanic rocks and bedded cherts had been thrust over Paleozoic strata of various ages. Following thrusting, an alaskite stock was intruded into the thrust plate, and lava flows and tuffs covered parts of the plate. Because of the importance of the igneous activity in the history of the Roberts Mountains, Charles invited me in 1939 to participate in the mapping project. We worked and lived under somewhat rugged conditions in the Roberts Mountains, but Charles was always an even-tempered and delightful field companion. The report on the Roberts Mountains thrust was published in 1942, and subsequent studies by Charles and by other geologists have demonstrated that it is the dominant structural feature of central Nevada.

Charles enjoyed his teaching experience at Cornell University, and he encouraged several able students to obtain advanced degrees. In 1939 he was promoted to Assistant Professor, and if our country had not become involved in World War II, the odds are that Charles would have had a long and illustrious career at Cornell. But by the summer of 1942, enrollment of men students had dropped appreciably in our colleges and universities, and Charles was invited by the U.S. Geological Survey to participate in the strategic minerals program. Because of his experience with Paleozoic carbonate rocks, he was assigned to study lead-zinc deposits in the Western States. He quickly learned the techniques of underground mapping and thoroughly enjoyed the banter with the miners. His first assignment was to the Warm Spring district, north of Hailey, Idaho, followed by studies in the Mount Hope and Lone Mountain mines, south of the Roberts Mountains in Nevada. His major assignment in Nevada was the Pioche district, involving the important Combined Metals and Prince mines. In addition, a study was made of the old Cerro Gordo lead mine in the Inyo Mountains of California. His reports on the ore deposits were well written and of great value in the appraisal of the lead-zinc resources during World War II, but Charles would not publish these reports, insisting that he was a paleontologist and not an economic geologist. He did take advantage of the opportunity to

map and describe the host rocks, sharing authorship with W. E. Hall and Mackenzie Gordon of two reports dealing with the Inyo Mountains. He followed these with professional papers on the geology at Cerro Gordo and on the Cambrian rocks of the Pioche mining district.

In 1948 Charles accepted the position of Associate Professor of Geology at the California Institute of Technology. At that time, personnel of the U.S. Geological Survey were widely dispersed in many field offices, and Chester Stock, an old friend of the Merriam family, was chairman of the department. During his stay at Cal Tech, many of the students were World War II veterans, and Charles developed a close relationship with these men. Also he was active in the affairs of the departmental library. By 1952 the U.S. Geological Survey was developing field centers so that the field personnel could share badly needed facilities. These provided stimulating environments for research. Charles was attracted back to the Survey because of the availability of space in the old Mint Building in San Francisco, near his old stamping grounds of Berkeley. In 1954 the center at Menlo Park was established, and Charles spent the remainder of his professional life there.

The remaining twenty-two years of Charles' professional life with the Geological Survey were among his most productive in terms of publications. He joined with Thomas B. Nolan and James S. Williams in the writing of a professional paper on the stratigraphic section near Eureka, Nevada, and with George W. Walker and Francis G. Wells in a description of the lower Paleozoic rocks in the northern Klamath Mountains. He was always accessible to the younger geologists at Menlo Park who sought advice and counsel about the geological problems in Alaska and Basin and Range provinces. If they had fossils that were in Charles' field of specialty, he would give them the age of host rocks. Other fossils were shipped to the appropriate specialists in Denver and Washington, D.C. From 1956 to 1957, Charles served as Chief of Paleontology and Stratigraphy Branch, and later during my tenure as Chief Geologist, he was Branch Chief for the period 1959-1962. I found that his advice was pertinent and helpful, and he was particularly valuable in recruiting young and able paleontologists.

The bibliography of Charles Merriam reveals a gap between 1964 and 1971. Previously, Charles began the culmination of his major contributions in paleontology: six professional papers on the rugose corals, largely from central Nevada but including the Klamath Mountains in California. For years Charles had been collecting these corals, and at first he cut many of the sections and did his own photography. In recent years he was given technical support, and the excellent photographs in these professional papers are the product of Kenji Sakamoto, a devoted friend of Charles.

Five coral zones were found in the Silurian rocks in the Great Basin, based on detailed stratigraphic studies and geologic mapping of reference sections. Rugose corals are of special importance in correlating the Nevada faunas with those in distant Silurian rocks, such as the Gotland section, a Silurian-carbonate standard for western Europe. The Devonian corals reflect east-west facies changes, and Charles recognized nine coral zones in the Great Basin Devonian carbonate rocks.

In recent years, Charles worked closely with Thomas B. Nolan, mapping in and around the Eureka district in Nevada. This was a very happy association for Charles, and each summer he looked forward to their joint efforts in unraveling the complicated structure and stratigraphy of the exposed Paleozoic rocks. Charles was a valuable partner because of his profound knowledge of the regional stratigraphy and fossils.

Charles was elected Fellow of the Geological Society of America in 1939 and he was vice-chairman of the Cordilleran Section in 1956. He became a member of the Paleonto-

logical Society in 1933 and was chairman of the Pacific Coast Section in 1961. He was Life Fellow of the California Academy of Sciences and a member of Sigma Xi. He was awarded the Distinguished Service Medal of the Department of Interior in June 1974.

His father, John C. Merriam, was one of the founders of the Save-the-Redwoods League, and for many years Charles kept in close touch with the activities of that organization. In general, Charles was not much of a "joiner," and in the later years of his life he rarely attended national meetings of the various geological societies. He was content to stay at home and think about "rugose corals."

Charles married Virginia Garrettson in 1935 and they had a very happy marriage. She died in January 1972, leaving a void in Charles' life—he seemed to lose much of his earlier buoyancy. He is survived by a daughter, Virginia M. Beeby, and two grandchildren, Debora Garcia and Charles David Beeby.

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