MEMORIAL OF GEORGE DAVIS LOUDERBACK

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George Davis Louderback, a charter fellow of the Mineralogical Society of America, was born in San Francisco, on April 6, 1874, and died in Berkeley, California, on January 27, 1957. He entered the University of California in 1892 and in 1896 received the A.B. degree. In 1899 he was awarded the Ph.D. degree by the University of California, his thesis being entitled "On the Origin of the Glaucophane and Associated Schists of the Coast Ranges. A Contribution to the Theory of the Crystalline Schists." This thesis was never published and has been listed by the University as "not available," though it is clear that Dr. Louderback's interest in these studies continued for several years as indicated by p rt of a one page note entitled "Study of the Basin Range structure and glaucophane and related schists of California and Oregon," *Carnegie Inst. Wash. Yearbook* **4:** 161 (1906) and an abstract of 7 lines entitled "Crocidolite-bearing rocks of the California coast ranges," *Bull. Geol. Soc. Am.* **18:** 659 (1908).

From 1900 to 1906 Dr. Louderback was professor of geology and mineralogy in the University of Nevada. He then returned to Berkeley and served as a member of the Geology Department from 1906 to his retirement in 1944. He also held numerous posts in various scientific, academic and governmental bodies. Only a few will be mentioned at this point. Professor Louderback was a charter member of the Cordilleran Geological Club which was founded at Berkeley on February 4, 1899, and, before the end of the year, became the Cordilleran Section of the Geological Society of America. He was always active in the section and served as its secretary from 1905 to 1914. He was president of the Seismological Society of America for many years and editor of its Bulletin from 1935 onward. From 1920 to 1924 he was a member of the Committee on Sedimentation of the National Research Council. In 1928 he was a member of the California State Commission on the failure of the St. Francis Dam and later served on other state consulting boards on the safety of dams. He was one of the founders of Epsilon Chapter of Theta Tau and always the chief patron of the chapter. From 1919 to 1925 he was Grand Regent of Theta Tau.

In spite of activity in the affairs of many organizations, extensive consulting and heavy administrative duties Professor Louderback managed to maintain an interest in scientific work and in teaching. The chief fields of his scientific interest were basin range structure and west coast stratigraphy, fault lines and earthquakes, but the mineralogical inclination shown by the title of his thesis was not wholly submerged. By far the

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1874–1957

(Photograph taken in Berkeley, 1937)

most important mineralogical episode in Professor Louderback's long career was his description of the rare gem mineral benitoite. The announcement of the discovery of this new mineral was made in July, 1907 (1). Though this was only a brief report it did indicate the extraordinary interest of the newly discovered mineral and the neptunite associated with it. A fuller report was given at the Albuquerque meeting of the Geological Society of America in December, 1907, but only a very short summary of this was printed (2).

The discovery of benitoite aroused great interest and, although Professor Louderback had indicated in the last sentence of his preliminary paper that he expected "shortly to make a more extensive report," nearly a dozen short papers by various authors dealing with benitoite and the San Benito County neptunite appeared before he was able to publish his definitive description. This was delayed almost two and a half years, in part by Professor Louderback's serious illness. The haste with which many had rushed into print deprived the final description of a little novelty but when it did appear it turned out to be a model of what the description of the properties and occurrence of a newly recognized mineral might be and has won for its author the very highest praise (6).

An especially noteworthy feature of Professor Louderback's final report on benitoite (3) was the careful establishment of the symmetry by means of etch figures, since benitoite was the first example of a material crystallized in the ditrigonal-dipyramidal class. When x-ray diffraction became available for the study of crystals several mineralogists again turned to the examination of benitoite and in 1930 Zachariasen's determination of the structure in the space group D_{3h}^{2}—$P\bar{6}c2$ supported the conclusion as to symmetry based on etch figures. Only one other material, the artificial germanate analogue of benitoite, is known to crystallize in the same space group.

A rare mineral found with benitoite in minute honey yellow crystals was recognized as new by Professor Louderback. Even though it was not possible to obtain enough for an analysis he reported the results of qualitative chemical tests, gave a careful description of its morphology and optical properties and named it joaquinite (2). Many years later others (4) amplified the description and, establishing the formula $NaBa(Ti,Fe)Si_4O_{15}$, justified the naming of this rare mineral which still awaits detailed study.

The rocks collected by Professor Louderback at the time of his work on benitoite have recently become available for inspection. It is found that he collected many specimens in the vicinity of the Gem mine not referred to in his papers on benitoite. Among these are fine samples of the minerals scattered about in the surrounding serpentine area that

have been eagerly sought of late. Some years ago collectors began to enter the area and to bring out glistening clusters of melanite, adamantine perovskite and other intriguing things, sometimes keeping the source hidden by false locality designations, but to this day no serious mineralogical study of these deposits has been published (5). Meanwhile the localities are being despoiled by large numbers who now come into this formerly remote area by jeep or jalopy. It seems a pity that Professor Louderback did not turn his superior talents to the study of these most interesting occurrences of calc-silicates and titanium minerals in veins and seams in serpentine and the associated chloritic rocks at a time when they were in a virgin state and all the best material would have been his for the taking.

No doubt his many other activities prevented Professor Louderback from continuing mineralogical studies after his brilliant start on benitoite. Soon thereafter he spent two years as leader of a geological expedition into the interior of China. During the first world war and immediately thereafter he was in charge of work on strategic minerals in California. From 1920 to 1922 and again from 1930 to 1939 he was dean of the College of Letters and Science and from 1925 to 1937 he was chairman of the Department of Geological Sciences. During all of this time he was most effectively active as a teacher of geology and petrology. Among the geologists who began their careers under his guidance may be mentioned E. F. Davis, N. L. Taliaferro, Roy Morse, Frank Hudson, Parker Trask, C. D. Hulin, A. O. Woodford, R. J. Russell, F. A. Moss, V. T. Allen, C. A. Anderson and C. Durrell.

For many years Professor Louderback was the mainstay of instruction in geology at Berkeley, mostly through his graduate courses and seminars. For several decades he conducted a graduate course in petrology in which Rosenbusch-Osann and Grubenmann-Niggli alternated from year to year as textbooks and the students spent many a tedious hour trying to interpret the often tortuous German texts. His methods were strictly those of the "sink or swim" school of instruction and they mostly had the approval of his graduate students who affectionately spoke of him as "the uncle" or "uncle George" but were always respectful in addressing him.

Bibliography

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3. George D. Louderback, 1909, Benitoite, its paragenesis and mode of occurrence. (With chemical analyses by Walter C. Blasdale.) *Univ. Calif. Publ. Bull. Dept., Geol.* **5**: 331–380.

4. C. PALACHE AND W. F. FOSHAG, 1932, The chemical nature of joaquinite. *Am. Mineral.* **17,** 308–312.
5. A. PABST, 1951, Minerals of the serpentine area in San Benito County, California. *Rocks and Minerals* **26:** 479–485.
6. A. PABST, 1957, George Davis Louderback. *Geochemical News* **8:** 4.

It is expected that a complete bibliography of Professor Louderback's scientific writings will be published in the Bulletin of the Geological Society of America.