
NATIONAL ACADEMY OF SCIENCES
OF THE UNITED STATES OF AMERICA
BIOGRAPHICAL MEMOIRS
VOLUME XXII—EIGHTH MEMOIR

BIOGRAPHICAL MEMOIR

OF

FREDERICK LESLIE RANSOME

1868-1935

BY

EDSON S. BASTIN

PRESENTED TO THE ACADEMY AT THE ANNUAL MEETING, 1941



F. L. Ransome

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Frederick Leslie Ransome was born in Greenwich, England, December 2, 1868, and came of Quaker stock. When he was only two years old his family emigrated to San Francisco, arriving there in 1870 when the city was in a period of rapid building and commercial development. His father, Ernest Leslie Ransome, founded there the Ransome Concrete Machinery Company and became a pioneer in American concrete construction, building the first concrete building and the first concrete bridge in America. He died in 1917. Of him Dr. Ransome wrote "From my father was probably inherited or learned a fondness for mechanical work, some recognition of the importance of systematic and conscientious industry, a realization of the importance of truth and personal integrity, and a sense of impartial justice." Ransome's mother, Mary Jane Dawson Ransome, was the daughter of a farmer in Suffolk, England. Of her he wrote "whatever love I have for good books, music, and art comes chiefly from my mother."

Ransome's elementary and secondary education was obtained in the California schools and his higher education at the University of California, from which he graduated in 1893. At the time he entered the University there was little to awaken a young man's interest in geology except the personality of Joseph Le Conte and almost no attempt was made to utilize the great natural advantages of the region for schooling in field geology. In 1890, however, Andrew C. Lawson came to Berkeley fresh from his doctoral work at Johns Hopkins as professor of mineralogy and geology. In the words of one of Ransome's fellow students, Lawson "was like a spark in dry tinder to us older students" and we "took fire at the first suggestion of field work."

In the summer of 1892 Lawson began geologic field work on the San Francisco sheet with Charles Palache as his assistant and the next summer Ransome began geologic surveys north

He had never been in the east before and found it much to his liking. He haunted the Boston book shops and art galleries."

While still at Berkeley, Ransome had been appointed a field assistant with the United States Geological Survey and the next year, having passed the Civil Service examination, he was appointed assistant geologist and invited to devote his full time to Survey work and to take up his residence in Washington, D. C. Thus was begun his long and fruitful career with the United States Geological Survey which was to bring him world-wide recognition.

His first Survey assignment took him back to his well-loved state of California and launched him at once, in collaboration with H. W. Turner, upon a study of the principal gold belt of California—the Mother Lode—one of the greatest gold producing regions of the world. The economic aspects of these studies culminated in 1900 with the publication of the *Mother Lode Folio*.

Soon after assuming his duties in Washington, Ransome became acquainted with Miss Amy Cordova Rock, then a student of geology and assistant to J. S. Diller of the Geological Survey. Miss Rock was the daughter of Miles Rock, astronomer and civil engineer. Their friendship and community of interests led to still closer bonds culminating in their marriage in 1900. A son and three daughters blessed this very happy union.

From its auspicious beginning on the Mother Lode, Ransome's field of activity shifted in succession to the San Juan region of southwestern Colorado, and in 1902 to Globe and Bisbee, Arizona. In 1904 he began, in collaboration with Waldemar Lindgren, the study of the Cripple Creek District in Colorado which, because of the richness of the deposits, their unusual mode of occurrence, and the skill with which they were studied and described, has become one of the classics of American economic geology. Ransome's next important study, begun in 1905 and published in 1908, was of the geology of the great lead producing district of the western United States, the Coeur d'Alene in Idaho, a district also characterized by features of

of the Golden Gate in Marin County. This was virtually the first detailed geologic mapping done in California. In 1894, when Charles Palache went abroad for study, Ransome succeeded him as Lawson's assistant. Of their closely related work at this time Palache writes:¹

"We were both interested in the glaucophane schists which were well developed in Marin County and one of Ransome's earliest papers (1894) was a fine one on the contact metamorphic origin of the schist on Angel Island, disproving the older idea that they were of regional metamorphic origin. We collected together on many trips and among the specimens we brought in on one occasion were crystals of a mineral neither of us were sufficiently good mineralogists to recognize as a new species. Two years later, and simultaneously, he in Berkeley and I in Munich, studied it, found it new and both picked for it the same name—lawsonite."

Ransome completed his work for his doctorate at Berkeley in 1896 and shortly thereafter went to Harvard University where for a year he served as assistant in mineralogy and petrography, working in close association with his friend and former classmate Palache, who writes² as follows in regard to those days in Cambridge and Boston:

"Ransome lived that winter, for reasons of economy, in a dreary brick cell on the fourth floor of the Museum where I had spent the previous winter. However he had the run of my more comfortable quarters in a nearby dormitory and we spent much time together there and at our meals at a club table in the College Commons in Memorial Hall. We shared a ticket to the Boston Symphony concerts in Boston, using it alternately. And many evenings were spent in my room with a group of whom I remember chiefly Irving Babbit, Charles Cestre, Charles Bakewell, and Tom Jaggar. Daly was abroad that winter and there were no other young men on the Harvard geological staff. The three men first named all made names for themselves in philosophy or letters and our talks were largely of literary matters. Kipling was just becoming the style and I remember our enthusiastic enjoyment of some of his poetry. Leslie and I went together to a few pleasant Cambridge homes and took many walks in the outlying New England country.

¹ Personal letter, January 31, 1941.

² Personal letter.

unusual interest. There followed a succession of valuable reports on the Goldfield and Yerington and Humboldt County ore deposits in Nevada (1909), on Breckenridge, Colorado (1911), and on Superior, Ray, Miami and Oatman, Arizona (1914-1923).

In the preparation of the Breckenridge report the writer served as Ransome's assistant and had an opportunity to observe and profit by his methods of field work. His work went forward with an unspectacular smoothness and effectiveness as a result of steady effort systematically applied. No time was wasted; maps and notes were meticulously kept up day by day. His assistants learned by the force of his example and no better schooling could have been had.

Ransome began his work with the United States Geological Survey under the administrative supervision and inspiring guidance of that great pioneer in applied geology in America, Samuel F. Emmons. With the death of Emmons in 1911, Waldemar Lindgren became his chief and the relations between Ransome and Lindgren were characterized by mutual confidence and respect. With Lindgren's promotion to Chief Geologist in 1912, Ransome succeeded him in charge of the metalliferous work and held that position until he left Washington in 1923.

Ransome's great contribution to American geology lay in his exceptionally orderly and lucid descriptions of so many of the important mining camps of the United States. He seldom went beyond the clear implications of his facts into the realm of speculation. He laid, however, a large and secure foundation of factual material absolutely essential for the development of any enduring concepts of the processes of ore formation. As Lindgren has said, "he built in his own chosen field of science, solid structures not easily destroyed, which stand the test of time." He was a skilled rhetorician in his own writing and critical of poor writing on the part of his colleagues whose manuscripts passed across his desk for criticism. One of his marked characteristics as an administrator was the promptness with which he acted upon all manuscripts that came to him from members of his section.

From time to time there came from Ransome's pen geologic

writings briefer than his regional monographs but of broader scope. Such an article was "The Present Standing of Applied Geology" which constituted the first article of Vol. I of "Economic Geology" and thus inaugurated a publication that has become the leading journal of applied geology in the world. A single sentence from this article may be quoted since it so well reveals Ransome's breadth of view and his own capabilities. "The most successful economic geologist is likely to be he who retains his interest in the broad aspects of the science and who sees to it that his capacity for general field study does not rust for want of use." Not only did Ransome contribute the first article to "Economic Geology," but he was one of its founders and served as associate editor for thirty years.

An article entitled "The directions of movement and the nomenclature of faults," published in 1906, focussed attention on certain inconsistencies and ambiguities in the nomenclature of faults and resulted shortly thereafter in a searching restudy of fault nomenclature by a committee of the Geological Society of America of which Ransome was a member. Ransome's constant striving to improve the accuracy of his own geologic field work and that of his associates is attested in an article on "The plane-table in detailed geologic mapping," published in 1912, urging the advantages of this method at a time when it was not generally used by field geologists.

In 1913 Ransome was one of seven well known American geologists to participate in the Silliman Memorial Lectures at Yale University and chose as his topic "The Tertiary Orogeny of the North American Cordillera and Its Problems." This paper was a masterly summary of the major topographic and structural features of this great province and was a companion to a paper by Lindgren delivered in the same series on "The Igneous Geology of the Sierras." Probably Ransome's shortest significant publication was a brief note in "Economic Geology" (1913, p. 721) in which he proposed the name *protore* "to designate the valueless material which generally underlies ores formed by sulphide enrichment and which itself would be converted into ore were the enrichment process continued to sufficient depth." This useful term is now in common use.

In April 1914 the importance of Ransome's contributions in the field of geology was formally recognized by his election to the National Academy of Sciences. He served the Academy and the National Research Council on several important committees and was treasurer of these two bodies from 1919 to 1924. In 1927 he served as President of the Society of Economic Geologists.

In 1922 the department of geology at the University of Arizona was being reorganized and Dr. Ransome was invited there as professor of economic geology. The long-standing ties with the Geological Survey in Washington were undoubtedly broken with deep regret and the beginning of a teaching career at the age of fifty-five required a considerable measure of courage. Arizona, however, was familiar ground to him and his four years at Tucson were notably successful among the advanced students by whom his rich background of field experience was especially appreciated. Of his years at Tucson his friend and colleague Dean G. M. Butler writes:³

"Dr. Ransome joined the faculty of the University of Arizona in the fall of 1922-23 as Professor of Economic Geology. Ransome's engagement marked the beginning of the expansion and improvement of the department that resulted from the interest and support of President C. H. Marvin, now head of George Washington University, and Dr. Ransome was such an admirer of Dr. Marvin that, when a cabal of faculty members forced the latter to resign four years later, Dr. Ransome refused to remain longer with the institution, and accepted a half-time position with California Institute of Technology, which he held until his death.

"While with the University of Arizona, graduate students of geology found his courses particularly inspiring and helpful, and he was appointed the first Dean of the Graduate College in the spring of 1925. The breadth of his interests was also recognized by the conferment upon him of the more general title of Professor of Geology.

"Partly because of their friendship for Dr. Ransome, Charles Schuchert and William Morris Davis were induced to join the geological faculty as lecturers, and there is no doubt but that Ransome should be credited with having done much to place

³ Personal letter, 1941.

geological instruction at Arizona upon a sound, productive basis."

The four years of teaching at Tucson served as a valuable preparation for the longer period of teaching at the California Institute of Technology. Some of the difficulties that confront the teacher of economic geology are interestingly discussed by Ransome in an editorial "On Teaching Economic Geology" published in 1926, but that he thought his educational problems through on a high plane is clearly shown by the following words in this editorial:

"Whatever may be the purpose of a vocational or technical school, the function of a university is clearly something higher and broader than merely training men to operate a transit, make assays, construct bridges, or grow oranges. The university ideal should be to develop young men and women intellectually, morally, and physically so that they not only know how to use their minds, in Huxley's phrase 'as cold logical engines,' but have the moral and physical strength to apply that knowledge wisely to the affairs of life. The educated man is he who through knowledge of the operations of nature and with a sympathetic understanding of the thoughts, words, and deeds of past generations of his fellows, as expressed in history, literature, and art, is able to think straight, to choose in life the things that are really worth while and to find his enjoyment in those pleasures that are noble and lasting—that leave some permanent good behind them, rather than in those that are merely trivial and evanescent. This power of wise choice, based on sound thinking, is probably the most valuable result to be gained from university study and contacts."

Soon after Ransome's removal to California in 1927 to become professor of economic geology at the California Institute of Technology the country was shocked by the disastrous failure of the St. Francis dam with its attendant loss of life. Its purpose was to store surplus water delivered from the Los Angeles aqueduct. No geological examination had been made of the dam site before construction began and Dr. Ransome was greatly interested in the geologic factors involved in its failure. His illuminating report published in 1928 constituted his first contribution in a field of engineering geology, to which he later devoted much attention, serving from 1928 to the time

of his death as consulting geologist to the United States Reclamation Service and to the Metropolitan Water District of southern California.

While Ransome's resignation from the United States Geological Survey naturally brought to an end his opportunities for comprehensive studies of the geology of individual mining districts, papers relating to engineering geology—to which he was devoting part of his time—continued to flow from his pen, as well as several papers dealing with broader aspects of economic geology, such as his "Historical Review of Geology as Related to Western Mining" which forms the opening chapter of the volume "Ore Deposits of the Western States" (Lindgren Volume). One of his last publications was a review of the fourth edition of Lindgren's "Mineral Deposits." While characteristically outspoken in his criticism of some features of this monumental work of one of his closest friends, his final statement is significant: "In the reviewer's opinion, it is outstandingly the best textbook on ore deposits in English and the most satisfactory one-volume text in any language."

It was characteristic of his abundant energy that he found relaxation not in idleness but in a different kind of work. He developed great skill in working with his hands and during the last years of his residence in Washington built in his home workshop a handsome and sturdy motor launch in which he spent many happy week ends on the Potomac with his family and his friends.

Ransome's personal qualities can hardly be better expressed than in Lindgren's words:

"Physically, he was tall, well-built, and muscular, giving an impression of great reserve force. His manner of speaking was slow and deliberate. He had an exceptionally well-balanced, sane mind, not easily ruffled or disturbed. Although he was a good conversationalist and an interesting talker on professional subjects, it was not easy to get intimately acquainted with him, to reach below his armor of reserve. But those who did get to know him well were amazed at his interest in, and knowledge of, music, poetry, and the arts. His mind and his abilities were so balanced that he would have made a success of almost anything that he undertook."

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His death at Pasadena, California, on October 6th, 1935, at the age of 67 followed an illness which he realized for some time was hopeless, but he prepared for the final summons with his characteristic calm fortitude. For those who were fortunate enough to know him well his career constitutes an example of an unusually rich, purposeful and useful life lived calmly, happily and wisely.

KEY TO ABBREVIATIONS

- Amer. Geol. = American Geologist.
 Amer. Inst. Min. Eng. Trans. = American Institute of Mining Engineers, Transactions.
 Amer. Inst. Min. Metal. Eng. = American Institute of Mining and Metallurgical Engineers.
 Amer. Journ. Sci. = American Journal of Science.
 Amer. Min. Congr. 23rd Ann. Conv., Rept. Proc. = American Mining Congress, 23rd Annual Convention, Report of Proceedings.
 Amer. Soc. Civ. Eng., Trans. = American Society of Civil Engineers, Transactions.
 Can. Min. Inst. Jour. = Canadian Mining Institute, Journal.
 Econ. Geol. = Economic Geology.
 Eng. Min. Journ. = Engineering and Mining Journal.
 Geol. Soc. Amer. Bull. = Geological Society of America, Bulletin.
 Geol. Soc. Amer. Proc. = Geological Society of America, Proceedings.
 Min. Mag. = Mining Magazine.
 Min. Sci. Press = Mining and Scientific Press.
 Nat. Geogr. Mag. = National Geographic Magazine.
 Pan-Amer. Geol. = Pan-American Geologist.
 Smithsonian Ann. Rept. = Smithsonian Institution, Annual Report.
 Univ. Calif. Pub., Bull. Dept. Geol. = University of California Publications, Bulletin, Department of Geology.
 U. S. Geol. Surv. Ann. Rept. = United States Geological Survey, Annual Report.
 U. S. Geol. Surv. Bull. = United States Geological Survey, Bulletin.
 U. S. Geol. Surv. Prof. Pa. = United States Geological Survey, Professional Paper.
 Wash. Acad. Sci. Journ. = Washington Academy of Sciences, Journal.

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