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Memorial of Walter Harry Newhouse
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WALTER HARRY NEWHOUSE

(summer 1951 in Wyoming)

Walter Harry Newhouse, Professor Emeritus of Geology, University of Chicago, and Fellow of the Mineralogical Society of America, died in Tuscon, Arizona, on September 21, 1969, at the age of 72. He was born December 13, 1897, the second of nine children of Edward Winfield and Hattie May (Elder) Newhouse at Fisher, Pennsylvania. He grew up in the rural area near Fisher and attended the local elementary and secondary schools. He earned his B.S. degree in Geology from the Pennsylvania State College in 1921 and began graduate studies under Waldemar Lindgren at Massachusetts Institute of Technology, where he was awarded the Master's degree in 1923 and the Ph.D. degree in 1926. During this period, Newhouse served as Lindgren's assistant. He was appointed to the Massachusetts Institute of Technology faculty in 1927 where he served until 1946 when he resigned to accept the position of Professor of Geology at the University of Chicago and, later the same year, the chairmanship of the Department of Geology. In 1957 he resigned from the chairmanship to devote full time to his research. In 1963, he retired as Professor Emeritus and moved to Tuscon, Arizona, where he spent his remaining time and efforts in writing the results of the research project that had occupied his interests for 25 years: the structural development and metamorphism of the Precambrian complex of the Laramie Range, Wyoming.

His doctoral dissertation on "Paragenesis of Certain Occurrences of Marcasite" was the beginning of a lifelong dedication to the investigations of mineral relationships in space and time. His treatment of the research problems and his method of research were characterized by the "natural history approach," a favorite expression of his. He combined careful field mapping with detailed observations of the textural, structural, mineralogic and compositional features of the rock. For the most part, Newhouse applied to the study of metamorphic rocks factors that are fundamental in ore deposits, such as the concepts of metasomatism, structural control, element migration, element mobility, open chemical systems, diffusion concentration of elements, mineral paragenesis, and ore—gangue mineral relations. To Newhouse, a metasomatic granite gneiss was a simple extension of the phenomenon of a metasomatic galena crystal in dolomite. These ideas developed as a consequence of an assignment that began in 1944 to map and evaluate the titaniferous magnetite deposits of the Iron Mountain district in Wyoming for the U.S. Geological Survey, for whom he served as part time geologist. Newhouse and his coworker, Arthur F. Hagner, were

convinced that the field and laboratory data justified a metasomatic origin for the titaniferous magnetite and its associated gangue minerals and that their emplacement was controlled by the deformation of the anorthosite country rocks. It became apparent in the Iron Mountain work that the anorthosite exhibited structural features that might be interpreted as influencing the emplacement of the plagioclase and accessory minerals of the anorthosite. Reasonable success of this hypothesis during detailed regional mappings of hundreds of square miles of terrain led to further application of the "structural control" of metamorphic mineralization to the granite gneiss masses adjacent to the anorthosite body. As more detailed structural detail were assembled, more mineralogic and compositional features were correlated with the structural data. These ideas were tested, refined, expanded, and applied to other rock masses, other metamorphic units of various grades, and to other areas in his patient and intense search for the final generalized model that accommodated all the data in an interpretive scheme. His techniques were the careful mapping, the careful specimen collecting, the careful measurement of the mineralogic or textural data, along with the "compare and contrast" plotting of the assembled data on a vast array of diagrams and maps which he devised. The generalities he formulated and their interpretative models were subjected to rigorous testing by searching for even the smallest exception to the data. Most of these models are useful over a range of application but are imperfect in some areas of extrapolation and, thus, he rejected or withheld from use the models and the ideas they were based on. Instead of a flood of papers coming from his prolific work, ideas, analytical schemes, new interpretations, or masses of carefully and uniquely measured data, he released only two brief papers that relate to his ideas over the past 25 years.

Although regrettable and disappointing to his associates, he did not regard his lack of publishing a loss. Science to him was a personal adventure, research was a private matter and the joys of discovery and personal understanding of nature were reward enough. The obligations toward his science, he felt, were met by imparting the enthusiasm, dedication and discipline to his students for their research and by leaving behind, if possible, the perfect theory and interpretation as his legacies rather than only a series of progress reports. To those who hold that research is a personal and private matter that is dominated by intellectual rewards, this attitude is perfectly acceptable; to those who regard the rapid progress and development of science and the requirement that the results be published as they become available so that others may improve and build upon them to be the controlling obligations, his attitude is regarded as unproductive and unacceptable. Walter Newhouse is viewed by his associates by one or the other of these two points of view. His constant quest for the "creative" process, its recognition in students, its nuturing in school, its role in scientific research formed one of two main conversation topics; the other was national and international politics. One could always count on a spirited and lively lunch hour debate that was characterized by his penetrating insight and his stimulating manner of stating problems in their extreme form or from unusual points of view that required reevaluations of all assumptions and biases. This mode of attack was characteristic also of his research and teaching. He had that rare knack of expressing in problems original descriptions, insights, and relationships. His greatest fear, the fear of being in a "mental rut" limited by a "narrow frame of reference," should have been his least concern because he could find new discoveries in the oldest problems. To be associated with him and to receive the daily shower of ideas and questions were exciting experiences that left permanent marks on even brief encounters.

At Chicago, Newhouse was dissatisfied with the manners and procedures of the traditional higher education processes as he saw them and was determined to change them. The revision of curricula; the stripping away of the obsolete; the review of the testing—evaluation processes; the establishing of originality and independent thought in prime roles in all phases of teaching; the identifying of criteria of excellence in students, in faculty, in research, in the profession; and the determining of educational objectives—all received his attentions and often painfully received his overhauling, frequently to the distress of many of his coworkers. Certainly he changed the system or changed significantly the rate the system was changing. Many regard him with deep respect and admiration; others who found their ideas and policies in conflict with his were aggrieved when they found he would neither compromise nor adjust to include their positions. Nevertheless, the department he built at Chicago was exciting and productive with regard to significant research, to impact on the science, and to students whose careers were launched.

Newhouse's accomplishments while at Massachusetts Institute of Technology are published in Harold W. Fairbairn's memorial to him in the *Proceedings of the Geological Society of America* and should be referred to for details on this phase of his career.

In the area of professional services, he was a member of the National Research Council Committees on Mineral Paragenesis and on Processes of Ore Deposition, an associate editor of the *Journal of Geology* and the *Annotated Bibliography of Economic Geology,* a member of the Illinois State Board of Natural Resources and Conservation, and a member of the advisory board of the Office of Naval Research. He was a fellow of the Mineralogical Society of America and the Geological Society of America; he was a member of the Society of Economic Geology, American Institute of Mining Engineering, Canadian Institute of Mining Engineers, American Academy of Arts and Sciences, Societe Geologique Beligique, and Society of Sigma Xi. In whatever organization he served, he brought the same high standards of perfectionism, of intellectual ideals, of total dedication and pioneering zeal that he applied to his research and teaching.

His marriage to Grace Edna Brown in 1923 formed a close life-long association. Although in poor health most of her life, she was his field companion during his long field seasons. Her patience, her cheerful good humor and understanding were his support and his inspiration. She and their son, Jan, a professor of biology at the University of Hawaii, survive him.

His many friends and colleagues will remember him with gratitude for the stimulation and enthusiasm they received from him, for the ideals and high standards he set and lived by as an example for us all, and for the many acts of generosity, of kindness, and of warm friendship. He will be greatly missed.

Publications of Walter Harry Newhouse

(1925) Paragenesis of marcasite. *Econ. Geol.* **20,** 54–66.

(1926) An examination as to the intergrowth of certain minerals. *Econ. Geol.* **21,** 68–69.

(1927) Some forms of iron sulphide occurring in coal and other sedimentary rocks. *Jour. Geol.* **35,** 73–83.

(1927) The equilibrium diagram of pyrrhotite and pentlandite and their relations in natural occurrences. *Econ. Geol.* **22,** 288–299.

(1927) Intimate intergrowths and mutual boundaries as proof of contemporaneous deposition. *Econ. Geol.* **22,** 403–407.

(1927) (with W. H. Callahan) Two kinds of magnetite? *Econ. Geol.* **22,** 629–632.

(1928) (with M. J. Buerger) Observations on wood tin nodules. *Econ. Geol.* **23,** 185–192.

(1928) The time sequence of hypogene ore mineral deposition. *Econ. Geol.* **23,** 647–659.

(1928) The microscopic criteria of replacement in the opaque ore minerals. *In,* H. W. Fairbanks, Editor, *The Laboratory Investigation of Ores.* New York, McGraw-Hill, pp. 147–161.

(1929) The identity and genesis of lodestone magnetite. *Econ. Geol.* **24,** 62–67.

(1929) (with G. Zuloaga) Gold deposits of the Guyana Highlands, Venezuela. *Econ. Geol.* **24,** 797–810.

(1929) (with W. H. Callahan) A study of the magnetite orebody at Cornwall, Pennsylvania. *Econ. Geol.* **24,** 403–410.

(1930) (with G. F. Flaherty) The texture and origin of some banded or schistose ores. *Econ. Geol.* **25,** 600–620.

(1931) Some relations of ore deposits to folded rocks. *Amer. Inst. Mining Metallurg. Eng. Tech. Pub.* **422,** 25 pp.

(1931) The geology and ore deposits of Buchans, Newfoundland. *Econ. Geol.* **26,** 399–414.

(1931) (with E. S. Bastin, L. C. Graton, W. Lindgren, G. M. Schwartz, and M. N. Short) Criteria of age relations of minerals with especial reference to polished sections of ores. *Econ. Geol.* **26,** 562–610.

(1932) The composition of vein solutions as shown by liquid inclusions in minerals. *Econ. Geol.* **27,** 419–436.

(1933) Mineral zoning in the New Jersey-Pennsylvania-Virginia Triassic area. *Econ. Geol.* **28,** 613–633.

(1933) The temperature of formation of the Mississippi Valley lead-zinc deposits. *Econ. Geol.* **28,** 744–750.

(1934) The source of vanadium, molybdenum, tungsten, and chromium in oxidized lead deposits. *Amer. Mineral.* **19,** 209–220.

(1936) (with J. P. Glass) Some physical properties of certain iron oxides. *Econ. Geol.* **31,** 699–711.

(1936) A zonal gold mineralization in Nova Scotia. *Econ. Geol.* **31,** 805–831.

(1936) Opaque oxides and sulphides in common igneous rocks. *Geol. Soc. Amer. Bull.* **47,** 1–52.

(1940) Openings due to movement along a curved or irregular fault plane. *Econ. Geol.* **35,** 445–464.

(1941) The direction of flow of mineralizing solutions. *Econ. Geol.* **36,** 612–629.

(1942) Editor *Ore Deposits as Related to Structural Features.* Princeton, New Jersey, Princeton Univ. Press. 280 pp.

(1945) *Report to U.S. State Department on iron ore possibilities in Liberia.* Unpublished, 110 pp.

(1949) (with A. F. Hagner and G. W. DeVore) Structural control in the formation of gneisses and metamorphic rocks. *Science,* **109,** 168–169.

(1949) (with A. F. Hagner) Cordierite deposits of the Laramie Range, Wyoming. *Wyoming Geol. Surv. Bull.* **41,** 18 pp.

(1955) Compositional lineation and its relation to complex folding. *Science,* **122,** 284.

(1957) (with A. F. Hagner) Geologic map of anorthositic areas, southern part of Laramie Range, Wyoming. *U.S. Geol. Surv. Mineral. Invest. Field Studies Map* **MF 119.**