

Memorial of Alan Mara Bateman January 6, 1889—May 11, 1971

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Alan Mara Bateman, Silliman Professor Emeritus of Geology at Yale University and, for half a century, Editor of *Economic Geology*, died at his home in New Haven on May 11, 1971, at the age of 82. Thus ended 60 years of highly competent and devoted service to economic geology, the mining industry, and his country.

Alan was born on January 6, 1889, in Kingston, Ontario, one of the four children of George Arthur Bateman and Elizabeth Janet Mara Bateman. His father started whetting the children's interest in the world around them before they were 10, encouraging them to use both hands and head by teaching them carpentry and such homely and useful skills as plumbing and wiring. Because his father was an ardent fisherman and outdoorsman as well, Alan also got an early start, at their summer home in the Thousand Islands, in some of the activities that were to give him so much pleasure throughout his life.

Alan entered Queens University in 1906. One of his classmates remembers him "as a very active red-haired and burly hellraiser, and an excellent student." Being by nature strong and athletic, he was very active in sports, particularly football and soccer. He was also a star performer in the Mandolin and Guitar Club. His practice of economic geology began while he was still an undergraduate. In the summers of 1907 to 1910, he was employed on prospecting parties, mostly in Ontario under A. E. Barlow, and in 1909 he was assistant to Barlow in a special survey of the Chibougamau district. During these years, he gained a reputation for his speed and endurance in the bush.

After his graduation from Queens in 1910, Bateman entered the graduate school at Yale, beginning his long association with that university. Although his main interest lay in the field of economic geology, presided over by the widely esteemed John Duer Irving, much of the groundwork and stimulation for his later career must also have come from others of its illustrious faculty, notably Professors Barrell, Pirsson, Dana, Ford, and Gregory. During the summers of 1911-12, Bateman served as an Assistant

Geologist of the Geological Survey of Canada, primarily in the Lillooet area, a gold district on the Fraser River of southern British Columbia. His work there was the basis for the dissertation, entitled *Geology and ore deposits of the Bridge River district, British Columbia*, that earned him a Ph.D. in 1913.

Upon completing his graduate work, he was invited to become one of the three field geologists of the Secondary Enrichment Investigation, a rich plum for a fledgling Ph.D. This investigation, inspired and guided by L. C. Graton and financially supported by a group of mining companies, was a two-pronged attack—field and experimental—on the problems of secondary enrichment. The work resulted directly in a large number of individual papers both from the Geophysical Laboratory scientists and from the field geologists, and for some years had a notable influence on the scientific study of secondary enrichment, experimental studies of sulfide systems, and mining exploration.

Among the many deposits that Bateman visited was that of Kennecott, Alaska, with its extraordinarily rich chalcocite ores. His work there gained him the confidence of the group that was dominant in the merger of the Alaskan mines with the far greater Utah Copper Company, and he served as a consultant to this group for many years, particularly in the interval from 1915 until 1942. He directed a number of explorations, especially in Alaska, in the Precambrian of eastern Canada, and in Mexico, and also made periodic reviews of the reserve estimates of properties in the Southwest; one observer has commented on the forthrightness of his reports, even where the conclusions were discouraging. Bateman was also, on occasion, retained by other companies, among them Selection Trust, which led him to visit the newly burgeoning Rhodesian (now Zambian) Copperbelt in 1929.

In the fall of 1915, Bateman returned to Yale as an Instructor in Economic Geology under Irving and soon began the service to the journal, *Economic Geology*, that was to continue for over 50 years. In 1916, Professor Irving, who was Editor of *Eco-*

nomic Geology, took leave to enter officer's training camp in the summer and fall, delegating his editorial duties to Bateman, by then Assistant Professor. In the spring of 1917, Irving was appointed a Captain in the Army Engineers, and left on duty from which he did not return, for he died in service in France in July 1918. Bateman, who had been made Assistant Editor in the spring of 1917, was appointed Editor in March 1919. During the same period, he first substituted for and then succeeded Irving as the professor of economic geology. He was made Associate Professor in 1922, Professor in 1925, and Silliman Professor in 1941. Following his return from government service in Washington, after World War II, he assumed the duties of Department Chairman, which he retained until 1957, when he was approaching retirement.

It was in June 1916, after his return to Yale, that he married Grace Hotchkiss Street of New Haven, who survives him. Their lifelong partnership was characterized by deep affection on both sides and an exceptional degree of companionship. Mrs. Bateman accompanied Alan to Alaska in the first summer of their marriage and in subsequent years was a partner on a number of trips to Europe, Mexico, and Africa. Their "family" included many close relatives, and most of Alan's numerous lasting friendships with contemporaries in New Haven and outside were shared by both wives and husbands.

As a teacher, Bateman was, expectably, most highly regarded by those who later went on to careers in mining. He excited the imaginations of those who were inclined in this direction with his accounts, commonly based on his own experience, of a variety of mineral deposits all over the world, and the practical wisdom that he imparted provided them with a valuable foundation for their future work. For many students, Alan's role as a mentor went far beyond the classroom. A former associate recalls that he always found time to lean back in his large leather office chair, pipe in hand or mouth, and listen to any student with questions or problems, offering his views or kindness, as appropriate. The hospitality of the Bateman home cheered the stay of many in New Haven. Large numbers of students obtained their first jobs in mining through his efforts, and because of his wide acquaintance in the mineral industries and the interest with which he followed his students' careers, he was often able to give a boost or two later on as well. The warmth of feeling that he engendered in his students is clearly revealed by

the dedication of the portrait given to him when he retired: "Presented by his students in gratitude for his forty-two years of devoted service to Yale geology, and for his many personal kindnesses to them."

Bateman's unique and perhaps greatest contribution was his Editorship of the journal *Economic Geology*. For practical purposes, he was editor from the time Irving left Yale, in the spring of 1917, until July 1969, a term of 52 years, plus an additional seven months in 1970 when he filled in during the sabbatical leave of his successor. For most of his 52 years, the journal was largely a one-man show. His detailed history of the first 50 years of the journal (1955) gives an excellent accounting of most of this stewardship; from first to last, he maintained the journal's international preeminence as a forum for those interested in mineral deposits.

Bateman's own writings, whether books, articles, or reviews, were scholarly and well written. Both as editor and author, he was an enemy of jargon, never using a long word where a short one would do.

His *Economic Mineral Deposits* has been popular with teachers of economic geology; the second, revised edition (1950) has sold about 40,000 copies and has appeared in Spanish, Japanese and Korean language editions. *The Formation of Mineral Deposits* (1950) has well served its purpose of giving individuals with relatively little or no training in geology an idea of how ore deposits form and some feel for the requirements and problems of exploring for and developing them.

The scholarly approach and thorough mastery of the literature that characterize his textbooks are also evident in his contributions to the scientific literature. His principal article on Kennecott (1920), coauthored by Donald McLaughlin, is notable for its successful defense, primarily from attack by their leader, Graton, of the concept that the chalcocite was hypogene—a concept that they supported with field and microscopic evidence. Their further conclusion, that the copper was deposited by heated meteoric waters that had extracted the metal from the Nikolai Greenstone, has a familiar ring today. Bateman's 1929 examination of the Rhodesian Copperbelt included a detailed microscopic study of the ores and led to the economically useful conclusion that the dominant chalcocite was hypogene and could, therefore, be expected to persist downward. His other conclusion, that the ore was epigenetic, was in agreement with most contemporary opinion about the deposits, but this opinion has been challenged in recent years on

the basis of much new field evidence. The pitfalls in using a microscopic study of ore textures to solve this particular problem are far more apparent today than in 1930.

Bateman's Presidential Address to the Society of Economic Geologists, published in 1942, was the ancestor of a later paper (1951) dealing with the iron-oxide deposits of magmatic affiliation. Both represent a nice blend of firsthand field examination, microscopic study, and reinterpretation of published field and laboratory data. His concept of late-magmatic gravitative liquid accumulation should, at least with modification, be the longest lived of his contributions to geologic thought. He must have been pleased later when the flow at Laco, Chile, described by Park, proved irrefutably that iron-oxide magmas exist, regardless of how they actually have formed.

The bald chronicle of Bateman's government services that can be found in standard biographical references gives little inkling of the nature and value of his work. Most notable was his service from January 1942 until 1945 as Director of the Metals and Minerals Branch of the Board of Economic Warfare, later the Foreign Economic Administration. When war broke out, the country became ruefully aware that it would have to depend on imports of nearly 60 minerals or metals rather than the dozen or so that had been generally recognized as inadequate. Although Bateman was not a businessman by training, his extraordinarily broad knowledge of the minerals industry and its people enabled him to recruit a top-grade staff of dedicated men, collectively knowledgeable in geology, mining, ore concentration, and smelting, and in the purchasing of ores, concentrates, and metals. He has described some of the operations of this group and their remarkable degree of success in expediting the flow of imported minerals in an article (1946) in which, characteristically, he looks ahead as well as behind at the need to preserve the gains that had been made in international cooperation. A simple list of his other government services, mainly in the period 1941-1953, is long, even excluding memberships on various boards and commissions that were automatically part of his work for B.E.W. To all he brought a broad knowledge of the economics of mineral production, skill as a negotiator, and dedication.

Bateman was a long-time Fellow of the Mineralogical Society of America, and of the Geological Society of America, and a member of the Society of Economic Geologists (President, 1940), American

Association of Petroleum Geologists, Mining and Metallurgical Society of America (President, 1956), American Institute of Mining, Metallurgical, and Petroleum Engineers, American Geophysical Union, Washington Academy of Sciences, and American Academy of Arts and Sciences. At Yale, he served for many years on the Executive Committee of the Sheffield Scientific School. His standing in his profession and his contributions to it have been recognized in many ways. In addition to the two society presidencies noted above, he was an Honorary Member of the Society of Economic Geologists and the Société Géologique de Belgique, and in 1962 was Penrose Medallist of the Society of Economic Geologists. Queens University awarded him an honorary D.Sc. in 1970. A special issue of *Economic Geology* with papers by his students, associates, and colleagues was dedicated to him in January 1971.

In addition to his numerous professional activities, Alan was, to the end, an enthusiastic sportsman. He enjoyed trout and salmon fishing in Canada, blue-fishing off New London, Connecticut, sailing, and golf, and for indoor recreation, he played bridge and Kelly pool. He was one of the Yale football team's most enthusiastic fans. For 52 years, the Batemans spent as much time as possible each summer at an attractive old farmhouse in Pleasant Valley, Connecticut, where he and Mrs. Bateman kept up extensive flower and vegetable gardens. Both were pillars of the Center Church on the Green.

Outwardly, Alan's self-assurance and sense of decorum, combined with an impressive physique, graced both his appearance and actions with an Olympian air. He gave the impression of gliding majestically through almost every imaginable situation. His extraordinary self-assurance was genuine, and stemmed from unwavering confidence in his ability to cope with the world around him, and from the strength and courage to face, with equanimity, any reverse that might be thrust upon him. It was extraordinarily difficult to persuade him that, after 50 years of editorship and a serious disabling operation on his jaw, it was imprudent to base plans for the journal on the assumption that he was still good for another 10 or 15 years. It would not be hard, at all, to believe that the enormous courage with which he endured his last, painful illness was fortified at least in part by confidence that death was something that might happen to others but not quite yet to him.

Those who looked beyond his massive self-assurance found one who was by nature a very warm,

loyal, and kindly man. He liked people and enjoyed their company. Although he was always forthright, rarely, if ever, would he downgrade a colleague or make unnecessarily critical remarks, and he would lean over backwards to avoid making a student uncomfortable. Among his very close friends, who included many in geology and mining and a coterie of nongeologist contemporaries in New Haven, he would shed most of the earnestness he was apt to wear among professional associates. To these he was a man of cheerful good nature, generous to a fault, enthusiastic in all that he did, and possessed of a refreshing sense of humor. They found him a delightful companion in all kinds of settings, and their stories about him reveal a light-hearted side of Alan that most of his younger professional associates had little opportunity to observe.

No one now living could know more than a few facets of this many-sided man, and it should be self-evident that this memorialist, like almost anyone else who might have prepared this memorial, would have to rely heavily on many associates of recent and former years. The sense of affection for Alan that pervaded so many of the letters received has been heart warming. This indispensable help is acknowledged with deep gratitude.

With the passing of Alan Bateman, economic geology has lost an outstanding teacher and editor to whom it will always be in debt; the mining industry and its affiliates in government have lost a highly respected, competent, and industrious servant; Yale has lost one of its most devoted sons; and the many

throughout the world who will continue to cherish their remembrance of him lost a kind and generous friend.

Selected Publications of Alan M. Bateman

The following selection of 10 of Bateman's many publications includes those deemed to be important or most representative of trends in his interests. Most of them are referred to in the memorial. A more complete list, excluding about 100 book reviews, is to be appended to a memorial being prepared for publication by the Geological Society of America, from which the above memorial has been abbreviated.

- (1914) Lillooet map area, British Columbia. *Can. Geol. Surv. Summary Rep.* **1912**, 188-210.
- (1920) (and McLaughlin, D. H.) Geology of the ore deposits of Kennecott, Alaska. *Econ. Geol.* **15**, 1-80.
- (1923) Primary chalcocite; Bristol copper mine, Connecticut. *Econ. Geol.* **18**, 122-166.
- (1930) The ores of the Northern Rhodesia copper belt. *Econ. Geol.* **25**, 365-418.
- (1942) *Economic mineral deposits*. John Wiley & Sons, New York, N. Y., 898 pages. 2nd Edition (1950), 916 pages.
- (1942) Magmas and ores. *Econ. Geol.* **37**, 1-15.
- (1946) Wartime dependence on foreign minerals. *Econ. Geol.* **41**, 308-327.
- (1950) *The formation of mineral deposits*. John Wiley & Sons, New York, N. Y., 371 pages.
- (1951) The formation of late magmatic oxide ores. *Econ. Geol.* **46**, 404-426.
- (1955) Economic geology [publication]. In A. M. Bateman, Ed., *Economic Geology, 50th anniversary volume, 1905-1955*. Economic Geology Publishing Co., Urbana, Illinois, pp. 1-37.

American Mineralogist, Volume 58, pages 367-369, 1973

Memorial of Donnel Foster Hewett June 24, 1881—February 5, 1971

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Donnel Foster Hewett, known by his many friends of all ages as Foster, was an enthusiastic and exuberant geologist who had a real devotion for minerals, particularly if they contained some manganese. He started his professional career in 1903 as a mining

engineer for the Pittsburgh Testing Laboratory and examined many mines in Canada, U.S.A., Mexico, and Peru. The highlight of this experience was his role in the discovery of the Mina Ragra in Peru which became the principal world source of vanadium for