MEMORIAL OF ALFRED WANDKE

L. C. GRATON, *Harvard University, Cambridge, Massachusetts.*

Alfred Wandke was born at Lisbon Falls, Maine, on May 13, 1887, graduated from Lewiston High School in 1906, from Bowdoin College in 1910, and from the Graduate School at Harvard in 1917. After many years spent in Mexico as mining geologist and mine operator, he was killed near Guanajuato, Mexico, February 14, 1941.

An appreciative record of Wandke's life with appropriate elaboration of the foregoing brief chronology having been prepared for the Geological Society of America by his good friend, Dr. M. N. Short, the present account may dwell especially on those characteristics which were so notably developed in this enthusiastic scientist.

Wandke inherited from his German-born parents a constitution tough as leather, a serious driving power that never tired, a sunniness that never dimmed, and a mind that never ceased inquiring. His high-pressure devotion to work and study while growing to maturity was balanced by a spontaneous joy in athletics and an unquenchable liking for human beings. Reaching his goal of a thorough training by the route of self-support, he came relatively late to the professional study of geology; but when he received his doctorate at the age of 30 his power was proportionate to his years.

The first professional job of Wandke's was at the important Pilares Mine at Nacozari, Mexico, where he quickly demonstrated his ability to handle both geology and men. This connection was interrupted by his entry into the War, where he carried on as vigorously and loyally as any tenth-generation American. Next he was included in the group that made an intensive four-year study of the Calumet and Hecla, one of the world's foremost copper producing companies that had never previously felt the need for systematic geology. Wandke was especially charged with the petrographical work, but participated also in the investigations in the several mines. It was here that first came into evidence his remarkable "photographic" memory, which enabled him to carry in mind a wealth of details regarding the underground, and which he later put to such excellent use in the finding of previously unsuspected ore shoots in centuries-old mines of Mexico.

Wandke was sent to Mexico in 1923 by the New York management of a famous but supposedly nearly-exhausted mine in the Guanajuato district, nominally as geologist but actually to perform a mission requiring the utmost in judgment, tact, decisiveness and, as it proved, physical courage. His discharge of this task was so eminently satisfactory that he was shortly made manager of the property. For several years previ-

Alfred Wandke
1887–1941

ously the operations had been conducted at a loss, and he had no capital to spend. But he managed to revamp equipment, achieve cleaner mining, raise recoveries, improve safety, and counteract the growing power of the mine unions by imbuing his workmen with the same objective as his own—viz., to restore prosperity to the grand old mine. His enthusiasm and unsparing expenditure of his own energy became contagious; the men accepted lower wages and worked harder, they quashed strikes before these got started, and when there was no longer money for pay rolls they turned with such effectiveness to leasing that royalties saved the day. In the 16 trying years as manager of this property Wandke had the satisfaction of seeing it emerge from the red to a resumption of profits—practically all of it won from ore unknown when he took control and found through his happy combination of scientific knowledge, keen observation, retentive memory and unrelenting application.

A little over a year before he was killed, he turned his entire attention to the operation of properties in which he personally was concerned, one in Zacatecas, the other on the outskirts of Guanajuato. This inaugurated a new cycle of uphill fights against the familiar enemies: timidly-hiding ore bodies, high costs, labor unrest and fickle metal prices. Pushing himself as ever before, he again imparted to those about him a sense of loyalty and cooperation which, coupled with his uncanny ability to find ore, promised to turn these undertakings into substantial successes. It was while driving at his usual pressing pace along the rough mountain road leading to one of these mines that a wheel gave way on a curve and plunged him to his death.

Wandke's preoccupation with men and materials and money never for an instant reduced his profound interest in geology. His boundless faith in the properties he handled rested on the conviction that sufficiently intelligent geological effort unremittingly applied would succeed in finding more ore where so much had already been found. He strove as conscientiously to keep abreast of current theory and method in mining geology as to maintain modern supplies in his warehouses and efficient equipment in his mines; he held membership in the American Mineralogical Society, the Geological Society of America, the Society of Economic Geologists and the American Institute of Mining and Metallurgical Engineers.

He travelled widely over the extensive Mexican metallogenetic province and was deeply impressed by the beauty and importance of the geological principles there revealed. It was his firm conviction that on certain grand problems of structure and of ore genesis no other area could shed so much light, and his only complaint about his heavy practical duties was that they prevented his immediate plunging into these absorbing scientific puzzles. He had long devoted time to a gradually

improving program of geological research in the Central Plateau which he hoped to support. Indeed, the mainspring of his almost feverish activity was the vision of completing early the provisions for his family so that resources thereafter might be devoted to research stipends for a succession of able young geologists to cooperate with him in this appealing investigation.

His geological writings are not numerous; but they reveal a penetrating insight and understanding of high order. Those of the later years in particular, produced when his major duties demanded the utmost in other directions, are a remarkable tribute to his deep scientific instinct and to his command over self. Perhaps the most significant of his contributions are: the recognition by careful microscopical work of alterational processes associated with the ores of Sudbury, which showed that the theory of magmatic segregation could not survive in the oversimplified form in which it was then visualized; the clearly recorded testimony of filled veins of low dip at Guanajuato in support of the thesis that the fracture walls were spread by the pressure transmitted by the ore-forming solutions; and the evidence deduced from cross-cutting veins at Tepezala that the pyrometasomatic processes are intimately related to the hypothermal.

Wandke's capacity for friendship was as deep and constant as his power to work. His letters to old friends were exhuberant, informing and genuine. In his professional domain and in his home he revealed generosity, good cheer and the joy of learning and doing. He fought the good fight, and he died in harness, as would have been his wish.

Bibliography

Geology of the Portsmouth basin, Maine and New Hampshire (abstract): *Bull. Geol. Soc. Am.*, **31,** no. 1, 138 (1920).

With Wade, W. R. Geology and mining methods at Pilares mine: *A.I.M.E.*, **63,** 382–407 (1920).

Intrusive rocks of the Portsmouth basin, Maine and New Hampshire: *Am. Jour. Sci,.* 5th ser., **4,** 139–158 (1922).

A petrologic study of the Cape Neddick gabbro (York County, Maine): *Am. Jour. Sci.*, 5th ser., **4,** 295–394 (1922).

With Hoffman, Robert. A study of the Sudbury (Ontario) ore deposits: *Econ. Geol.*, **19,** 169–204 (1924).

The Caridad mine, Sonora, Mexico: *Econ. Geol.*, **20,** 605–607 (1925).

Molecular migration and mineral transformation: *Econ. Geol.*, **21,** 166–171 (1926).

With Martinez, Juan. The Guanajuato mining district, Durango, Mexico: *Econ. Geol.*, **23,** 1–44 (1928).

With others. The copper deposits of Michigan: *Prof. Paper* **144,** *U.S.G.S.* (1929).

Ore deposition in open fissures formed by solution pressure: *A.I.M.E., Tech. Pub.* **342,** 15 pp. (July 1930).

With Moore, T. G. Pyrometasomatic vein deposits at Tepezala, Aguascalientes, Mexico: *Econ. Geol.*, **30,** 765–782 (1935).