# Memorial to Gerald Ashley Waring
## 1883—1971

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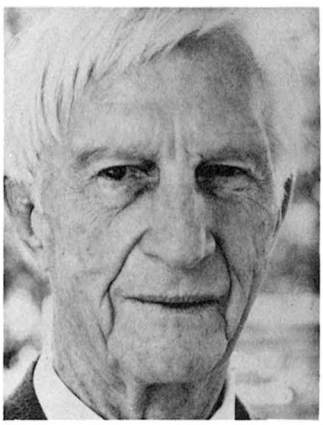

Gerald Ashley Waring was a gentle, conscientious, modest man, whose full and varied life included chapters that were probably little known to most of his associates.

Waring was born in Ouray, Colorado, on September 6, 1883, as the oldest of two sons of John C. Waring and Etta Richardson Waring. His father, who had come to Ouray in 1871, worked as a mine carpenter in the famous Camp Bird mine and as a prospector in the surrounding west San Juan Mountains. Evidently finding the life of a prospector a little unreliable, the Warings moved in 1887 to San Diego and then to nearby Fallbrook, California, where the father went into the lumber business.

Waring graduated from high school in June 1900, and worked on farms and on a railroad gang until entering Stanford, then a relatively new well-endowed university that was just getting started—and charged no tuition. During his Christmas vacation of 1904 he made one of the early studies of the Pala pegmatite, a gemstone locality in San Diego County; this led to his first publication in 1905. He obtained an A.B. in geology in the spring of the same year, but was unable to start immediately in professional work because his father's poor health required his help in the family lumber business.

Gerald returned to Stanford in May 1906, a few weeks after the San Francisco earthquake, just as a study of the geologic and other effects of the earthquake was starting under the direction of his professor, John C. Branner, chairman of the Stanford department of geology. Gerald was assigned for six weeks to study the part of the San Andreas fault that extended southward from Palo Alto through the Salinas Valley. A summary of his observations was published in the report of the California Earthquake Investigation Commission.

In August 1906, W. C. Mendenhall, then chief of the Ground Water Division of the U.S. Geological Survey (and later director), hired Waring as one of the first groundwater geologists for temporary duty at $100 per month to study the water resources of southeastern Oregon; these lands were then being homesteaded for dry farming, but many parts lacked adequate water. Gerald notes, in a fascinating diary used as a source for much of the material of this memorial, that he started the reconnaissance by "buying a cheap horse, saddle, and buckboard."

In 1907 he extended his reconnaissance into the Harney Basin, where he became interested in the numerous thermal springs near Malheur and Harney Lakes. This was evidently his first exposure to thermal and mineral springs—an interest that continued throughout his life. Receiving a full-time appointment in 1908 as a junior geologist, he

began a study of the thermal and mineral springs of California.

Professor Branner, a consultant to the Brazilian Government, provided Waring with his first opportunity for foreign work as a hydrologist in northeastern Brazil. Waring accepted, with the provision that his report on California springs would be completed first. (Throughout his life and clearly evident in his diary, he conscientiously attempted to complete every report he had any obligation to write; he published as much as he could from his commercial jobs, and he was also the unacknowledged "finisher" of many reports by less able writers within and outside of the U.S. Geological Survey.)

Waring was furloughed from the Survey from 1910 to 1913 for the Brazilian work, which emphasized potential reservoir sites and the possibilities for water from shallow wells in the large drought-stricken region. He also established many stream-gaging sites, and he conscientiously trained his Brazilian assistants in methods for obtaining the essential basic data—evidently the first application of such studies in Brazil. One of the many interesting items of his diary is a map of Brazil, summarizing the places, routes, and modes of locomotion he used during his three years of this work. What modern-day geologist could claim the following record: by steamer, 19,960 miles (including several trips to New York); by train, 11,100 miles; and by muleback, 2,890 miles!

Gerald first met Kathryn Romer Kip during their student days at Stanford, from which she graduated in 1904. While still with the Geological Survey in 1910, he and Kathryn were engaged, and they were married in Rio de Janeiro in August 1911. Kathryn accompanied him on many muleback trips in remote parts of Brazil. As a former teacher and student of music, she recorded many previously unwritten folk songs of the region.

In 1913 Waring returned to the Geological Survey to the Land Classification Branch (now Conservation Division), and in 1915 he transferred to the Ground Water Branch, with field work in Connecticut, Alaska, California, and Nevada. He was assigned the job of assembling and revising a ground-water study of Mississippi. Typically, his diary expresses no complaint, but this chore may have caused him to resign from the Survey in 1917 for the first of his several ventures in petroleum geology. Initially he was in Oklahoma and Texas. From 1919 to 1923 he worked in Trinidad as chief geologist of the Trinidad Petroleum Development Co., Ltd. His work there consisted mainly of supervising several field parties, with emphasis on the deeply weathered and heavily vegetated southern half of the island. Exploration for petroleum in Trinidad proved to be disappointing. After test wells in several key areas failed, the program was cut back to small local efforts. His continuing interest in publication resulted in the most comprehensive report on Trinidad to that time.

Waring returned to Oklahoma in 1923 as chief geologist of the Margay Oil Corporation. He was reputed to be a good "oil finder," specializing in unravelling stratigraphy and structure. His physical endurance in the field and his attention to details contributed to his success.

Only a few years later, the depression brought disappointments and frustrations to Waring along with many others. Overproduction and low prices forced many oil com-

panies out of business, and geologists out of jobs. Gerald was caught; after six months without a job, he was offered temporary work on the Geological Survey in helping to develop mineral supplies for the Alaskan Railroad. He was the government supervisor for the contract drilling of coal deposits of Anthracite Ridge. The job was completed on December 27, 1932, with discomfort and unhappiness by all participants—and with no indication of commercial coal.

In August 1933, Waring returned to ground-water work with the Survey under O. E. Meinzer. The main effort was to obtain adequate water supplies for CCC camps that had been set up in many parts of the Western States, without much prior regard for water supply.

By late 1937, international petroleum exploration again looked attractive, so Waring took part in Socony-Vacuum's exploration of eastern Venezuela. In 1939, just before World War II, he was transferred to Egypt to explore the area near and southwest of the Suez Canal. Field work continued under increasingly difficult conditions, and was completed hastily in May 1940, after the German invasion of Holland and Belgium. He and Kathryn were evacuated by way of Trans-Jordan and India.

Gerald's physically most active years evidently included numerous adventures and exciting episodes, but he was always too modest to make much of those events; his adventures were described only rarely and laconically. Once he took a knife away from a violent character and later described the event to his family as if it were quite unimportant.

Gerald again returned to the Geological Survey early in 1941 on a search for adequate water supply for military camps, at first in Trinidad and then in the Western States. He also worked with O. E. Meinzer in a major compilation, "The Bibliography and Index of Ground-Water Publications." He noted, with his usual interest in such details, that he added 1,150 references to Meinzer's earlier compilation. He was soon transferred, in August 1942, to the newly formed military geology group of the Survey because of his knowledge about water and petroleum supplies, his foreign experience in Latin America and the countries south and east of the Mediterranean, and his knowledge of foreign languages. He was unable to publish the results of these efforts. His initial studies involved Egypt, Libya, Morocco, Tunisia, and Algeria; subsequently Sicily, southern Italy, and the Balkan countries; then Indochina, Southeast Asia, and southern France by October 1943; the Pacific islands and the Philippines early in 1944; northern Japan and eastern China late in 1944; and a "hurry-up terrain map of Germany" early in 1945. His work for the group was then completed with a report on Manchuria.

Waring then returned to the Ground Water Branch for studies in the Missouri Basin, and to update his bibliographic compilation of ground-water studies with Meinzer prior to its publication in 1947 as *Water-Supply Paper 992.*

He requested retirement from the Survey early in 1947 at the age of 64, returning to the Stanford area. His old friend from Texas and Oklahoma, A. I. Levorsen, was then dean of the school of mineral sciences at Stanford. To Gerald's great pleasure, he

received an appointment as a research associate, which "entitled him to use all of the Stanford libraries."

Waring may have retired but his work did not stop! In fact, his retirement enabled him to pursue his early interests in thermal springs, spending a few hours nearly every day in the Stanford libraries. As he exhausted these local sources he increasingly utilized the libraries of the University of California in Berkeley and the Geological Survey library in Menlo Park. He walked wherever he could to geological meetings and to the libraries at Stanford, but otherwise used buses. All this was a labor of love, with no salary, clerical help, or even much encouragement. Regardless of the language of an original publication, Gerald somehow always managed to understand its substance. He developed contacts with many foreign students at Stanford and invoked their help. His friends never knew whether he paid for this help with his own money–but he probably did! As the project developed and its magnitude became evident, he started to worry about its publication. After seeing a sample of the proposed text and maps in 1954, Dr. Nelson Sayre, the chief of Ground Water Branch, tentatively accepted the report for publication as a Water-Supply Paper; the first version was submitted in March 1955.

Waring then agreed to assist in assembling the bibliography and basic data for two chapters of the sixth edition of "Data of Geochemistry." This kept him working about halftime for two years on a special Survey appointment, building upon his many references from thermal springs of the world. By 1959 the latter had been revised again, with continuous adding of much new material. When shipped to Washington in March 1959, the manuscript contained over 3,000 pages of text and tables (altogether 35 pounds, his diary noted, and 80 maps!). The gods and the Survey generally move slowly! By January 1961, the water resources division proposed publishing the report as a Professional Paper, retaining all tables, maps, and references, but deleting most of the annotations that had been prepared with so much time and effort. Nearly six years had then elapsed since the first version was submitted, and Gerald was anxious to "get moving" to publication. This did finally occur in 1965; he noted that his first copies of *Professional Paper 492* were received on September 21. The report contained 383 pages, 82 map figures, and 3,733 bibliographic references! His long and at times frustrating efforts had indeed paid off. He first had become interested in thermal springs about the time (1904) that electricity was first generated from geothermal energy in Italy–when general interest in spas and any medicinal qualities of springs had waned in the United States. Geothermal power had no advocates, or even a definition of the term during the first half of this century; interest started to build up slowly through the 1950s with developments in New Zealand and Iceland, and then spurted in the 1960s with successful developments in California. The United Nations then focused attention on geothermal potential in the developing nations, many of which have numerous volcanoes and thermal springs. Waring's world-wide compendium has served almost as a "Bible" in the first evaluation of each nation's potential. He was indeed pleased to know how much his earlier efforts came to be appreciated.

Waring was a Fellow of The Geological Society of America (elected 1921), and had

memberships in the American Association of Petroleum Geologists, the American Association for the Advancement of Science, and the Geochemical Society.

The Warings' generous nature and interest in education were evident in their establishment in 1956 of a scholarship for geology students at Stanford; this interest and continued support were demonstrated throughout their final years. Their warm and happy marriage of nearly 59 years ended with Kathryn's death in June 1970. He survived his much loved wife by little more than a year, his death occurring on November 2, 1971. A son, Gerald Worden Waring, resides in Davis, California; and a daughter, Winifred Waring, lives in Sunnyvale, California.

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