

## Memorial of Fred Earl Ingerson 1906–1993

MICHAEL FLEISCHER

Smithsonian Institution, Washington, DC 20560, U.S.A.

Earl Ingerson (he never used his first name), a long-time Fellow of the Mineralogical Society of America, died on June 11, 1993.

He was born in Barstow, Texas, on October 28, 1906. He received his B.A. degree in chemistry in 1928 and his M.A. degree in geology in 1931 from Simmons University, Abilene, Texas. He did graduate work at Yale University, receiving his Ph.D. degree in 1934 with his dissertation, "Ultrabasic Intrusions of the Trout River Area, Western Newfoundland." In 1934–1935 he did postgraduate work at the University of Innsbruck with Bruno Sander on petrofabric analysis. In 1935 he joined the Geophysical Laboratory as a physical chemist and petrologist.

I recall my first meeting with him at the Geophysical Laboratory, where I began research work under George W. Morey in February 1936. I remember my astonishment at learning that we had been graduate students at Yale University, Earl in geology and I in chemistry, at the same time for three years without ever meeting—this in a university where a generation earlier there had been very close collaboration between these two departments.

I was to learn in the next few years that, despite the publication of F. W. Clarke's *The Data of Geochemistry* by the U.S. Geological Survey—a best-seller with successive editions in 1908, 1911, 1916, 1920, and 1924—the chemistry departments of U.S. universities were ignorant of and indifferent to the application of chemistry to the solution of geological problems, that geochemistry had no status in most curricula, and that geochemistry had not been recognized as a scientific discipline by the U.S. Civil Service Commission.

What a change has occurred since then! Earl played a major role in that change. He initiated the discussions that led to the founding of the Geochemical Society in 1955 and served as its President during the crucial first two years. Later, realizing the need for an international organization, he was the driving force in the founding of the International Association of Geochemistry and Cosmochemistry (I.A.G.C.) and served as its first President, 1966–1972.

He took an active part in the negotiations that led to the publication in 1950 of *Geochimica et Cosmochimica Acta* and served as one of its editors for many years. He was the founding editor of *International Geology Review* and was responsible for the publication of translations from the Russian journal *Geokhimiya* and of translations of many Russian books on geochemistry.



Earl's early research work at the Geophysical Laboratory on equilibria in hydrothermal systems and his 1937 review, with G. W. Morey, "The Pneumatolytic and Hydrothermal Alteration and Synthesis of Silicates," helped provide the impetus for their continuing research in this field and for the work of other interested experimenters, all of which led later to the successful growth of synthetic quartz crystals. His reviews, "Liquid Inclusions in Geologic Thermometry" (1947), "Non-radiogenic Isotopes in Geology" (1953), and "Methods and Problems of Geologic Thermometry" (1955) more than met the criterion for such reviews set by W. W. Rubey—"A review should not be an obituary of a dead field; it should be a critical summary that inspires so much research that the review becomes obsolete in a few years."

I must mention Earl's years as Chief of the Geochemistry and Petrology Branch of the U.S. Geological Survey (1947–1957), which I joined in 1939. When World War II ended, W. T. Schaller, Chief of the Chemistry and Physics Branch, and C. S. Ross, Chief of the Petrology Branch, asked to be relieved of administrative work to return to research, and W. H. Bradley, Chief Geologist, decided to merge these two branches under Earl's direction. As a consequence, Earl and I had ten good years of working closely together. The search for U caused an unprecedented expansion (nearly tenfold) in the Branch, with imaginable stresses in equipping and staffing the work, and with strong simultaneous outside pressure against research and in favor of "rock-in-the-box" studies. Earl not only maintained the Survey tradition for continuing fundamental research, expanding experimental mineralogy (Paul Barton, David Stewart, and others), the study of conditions of formation and constitution of U-V minerals (R. M. Garrels, with E. S. Larsen III and H. T. Evans), and the crystal chemistry of the borates (C. L. Christ and Joan Clark), but also led the Survey into new fields, such as isotope geology (H. E. Suess, Meyer Rubin, Irving Friedman, T. W. Stern, and L. R. Stieff), volcanology at the new laboratory at Kilauea (K. J. Murata and others), and organic geochemistry (Irving Breger and Maurice Deul).

Earl resigned from the U.S. Geological Survey to become a professor of geology in the University of Texas, Austin, in 1958, and remained there until his death, eventually in emeritus status. He was associate dean of the Graduate School, 1961–1964.

He served our Society as Treasurer from 1941–1958. His contributions to science have been recognized by the

honorary D.Sc. degree from Hardin-Simmons University in 1942, the Day Medal of the Geological Society of America in 1955, and the Distinguished Service Medal of the Department of the Interior in 1959. He was an Honorary Life Fellow of I.A.G.C. and an Honorary Life Member of the Geochemical Society.

#### SELECTED BIBLIOGRAPHY OF F. EARL INGERSON<sup>1</sup>

- Relation of critical and supercritical phenomena of solutions to geologic processes. *Econ. Geol.*, 29, 454–470 (1934).
- Layered peridotitic laccoliths of the Trout River area, Newfoundland. *Am. J. Sci.*, 35, 422–440 (1935).
- Fabric analysis of a coarsely crystalline polymetamorphic tectonite. *Am. J. Sci.*, 31, 161–187 (1936).
- Accurate orientation of thin sections. *Am. Mineral.*, 22, 760–772 (1937).
- Laboratory technique of petrofabric analysis. *Geol. Soc. Am. Memoir*, 6, 209–262 (1938).
- Apparatus for direct measurement of linear structures. *Am. Mineral.*, 27, 721–725 (1942).
- Why petrofabrics? *Trans. Am. Geophys. Union*, 25, 635–652 (1944).
- Liquid inclusions in geologic thermometry. *Am. Mineral.*, 32, 375–388 (1947).
- The water content of primitive granitic magma. *Am. Mineral.*, 35, 805–816 (1950).
- Non-radiogenic isotopes in geology: A review. *Bull. Geol. Soc. Am.*, 64, 361–373 (1953).
- Methods and problems of geologic thermometry. *Econ. Geol.*, Fiftieth Anniv. vol., 341–410 (1955).
- Geologic literature for chemists (with R.F. Leo). *J. Chem. Educ.*, 44, 751–754 (1967).

<sup>1</sup> To obtain a copy of the complete bibliography of F. Earl Ingerson, order Document Am-94-567 from the Business Office, Mineralogical Society of America, 1130 Seventeenth Street NW, Suite 330, Washington, DC 20036, U.S.A. Please remit \$5.00 in advance for the microfiche.