

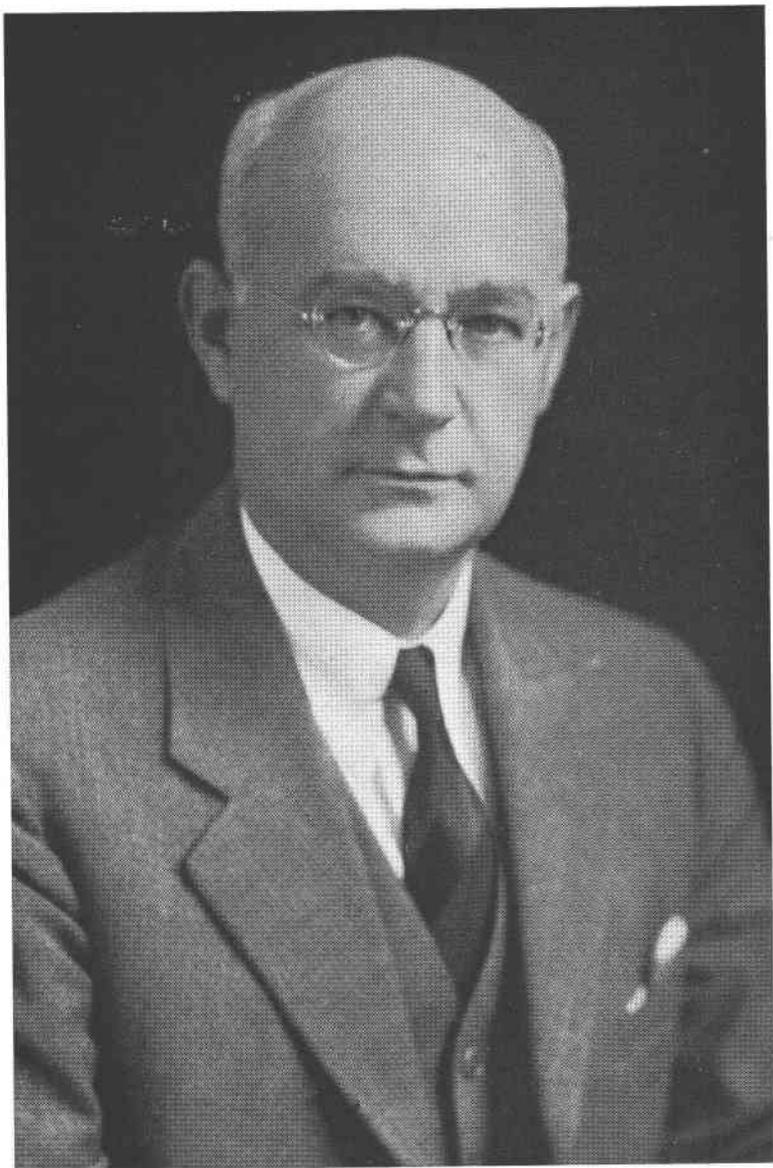
MEMORIAL OF GERALD FRANCIS LOUGHLIN

WILBUR S. BURBANK, *U. S. Geological Survey, Washington, D. C.*

Gerald Francis Loughlin, former Chief Geologist of the United States Geological Survey, passed away in the evening of October 22, 1946, a little over two years from the time that he had relinquished his administrative duties in order to devote himself to research. After more than 25 years of unselfish devotion to administrative services he had looked forward to continuing some of his earlier research activities and to working in new fields. His death, from a heart attack, came as an unexpected shock to his friends as well as to his immediate family, for he had suffered no serious illness, although he had been slightly indisposed a week or so prior to his death from what appeared to be a minor ailment. His greatly increased responsibilities in the last few years of service as Chief Geologist during the war had been a considerable strain and one from which he had not fully recovered his normal vigor.

Loughlin was born in Hyde Park, Massachusetts, December 11, 1880, the son of John Francis Loughlin and Adelia (Lane) Loughlin. After seven years of training in the Boston Latin School he entered the Massachusetts Institute of Technology in 1899 and received the degree of Bachelor of Science in geology in 1903. As an undergraduate at "Tech" his interest in geology was first aroused by Professor W. O. Crosby, with whom he spent his earliest days in the field and with whom he collaborated on his first publication. Shortly after his graduation he worked as a field assistant with the United States Geological Survey and the Connecticut Geological Survey under Dr. Herbert E. Gregory, studying the clays and clay industry of that State. He then entered the Yale Graduate School under a teaching fellowship, and there he received his doctorate in 1906. His graduate work, which was carried on under Gregory, Pirsson, and Barrell, dealt with problems of igneous and metamorphic geology in Connecticut and adjacent States, and in the period before his death he turned again to these early interests; he began to prepare a review of certain phases of the metamorphic geology of New England, and to aid in the preparation of a new geologic map of Connecticut.

In 1906 Loughlin returned to Boston, and he held an instructorship in geology at the Massachusetts Institute of Technology until 1912. Beginning in 1910, he also served summers as Junior Geologist with the United States Geological Survey, first with Frank C. Calkins in Idaho and later with Waldemar Lindgren at Tintic, Utah. Partly through the interest of these men in his work he decided to become permanently associated with the Geological Survey and went to Washington, D. C.,



GERALD FRANCIS LOUGHLIN
1880-1946

in 1912. His field work carried him again into the west, where under B. S. Butler and his associates he contributed to the comprehensive study of the mining districts of Utah then under way. In 1913 he also made a special mineralogic and structural study of newly developed oxidized zinc ores of the Leadville district, Colorado, and later the same year reviewed the field work in this district with J. D. Irving, who was then working on the uncompleted manuscript of the report on Leadville started by S. F. Emmons before his death. A few years later Irving entered into war service in France, where he died in 1918, and the entire task of completing the Leadville Professional Paper then fell to Loughlin.

In the meantime, when he returned to Washington after the 1913 season, he had assumed the subjects of building stones and cements for the annual volumes on Mineral Resources, then prepared by the Geological Survey. In this commodity work he brought to bear his characteristic thoroughness and analytical approach, and he soon won recognition for his investigative contributions in the mineral industry as well as in the field of scientific geology. Within a few years, however, his research work in economic geology became increasingly interrupted by administrative duties, for in 1917 he was appointed Chief of the non-metals section of the Division of Mineral Resources, and in 1918 was in charge of the section of metal resources as well as of stone and lime investigations. In 1920 he assumed charge of the entire division of Mineral Resources including its western offices, a position which he held until 1924, when the activities of this division were transferred to the Bureau of Mines. During his service with this division he contributed many chapters to the annual reviews of mineral resources, and made a number of special investigations of building stone that won him national recognition as an authority on this subject.

Dr. Loughlin served from 1924 to 1935 as Geologist in Charge of the Section of Metalliferous Geology, and from 1935 to 1944 as Chief Geologist of the Geological Survey. From 1944 until his death, he served as Special Scientist, and as a staff geologist, advisory to the Director and to the Chief Geologist. During the years of administrative service he managed to continue his investigations of mining districts and of special geologic subjects, completing the widely known Professional Paper on the Leadville mining district in 1925 and initiating a study of deep-level mining activities in the Cripple Creek district of Colorado. He always kept in close touch with a broad field of economic geology and contributed papers in petrology, ground water, economics of minerals, and other special subjects, besides his larger publications that are internationally recognized as important contributions to economic geology.

He was a research man at heart, but he possessed that combination

of qualities desirable for effective administration of scientific work. Guided by his own urge in scientific pursuit, he was always sympathetically appreciative of the work and aspirations of others and ever willing to devote much time to helpful advice and criticism. Being of the older administrative school, he was not given to easy familiarity in his everyday professional contacts, but at his ease and through other informal associations he displayed an ever present fund of humor and enjoyment of comradeship. One of his favorite forms of relaxation was in music. Before and during his college years he had become proficient enough with a flute to engage in amateur and even in professional orchestral work, and he also sang and played the piano. He was also active in college musical shows and composed music as well as verse for several of them. This enjoyment of music and of light satire inspired him to take part in many shows of the Pick and Hammer Club of the Geological Survey where the foibles of the organization, administrative or geologic, were annually ridiculed. He contributed to the musical scores and jibes at these performances and could never resist an invitation to train and lead the choral activities of the vocally inclined geologists.

Dr. Loughlin was a member of many national scientific and engineering societies, in several of which he served on administrative committees or held positions of honor. He was President of the Society of Economic Geologists in 1940 and of the Geological Society of Washington in 1923, and had served as Councilor and in other capacities with the Geological Society of America. He was also a member of the American Institute of Mining and Metallurgical Engineers, the American Association of Petroleum Geologists, the American Geophysical Union, and of the Washington Academy of Sciences, and a Fellow of the Mineralogical Society of America and of the American Association for the Advancement of Science. He was a prominent and active member of the All Souls Unitarian Church of Washington, D. C., and belonged to the Cosmos Club in that city. He was a member of the Society of Sigma Xi.

When Dr. Loughlin returned to Boston in 1906 he married Grace Elizabeth French of Boston, Massachusetts, who with their daughter, Mrs. Wilbur S. Burbank, and two grandchildren, all of Washington, D. C., survive him.

BIBLIOGRAPHY

- A descriptive catalogue of the building stones of Boston and vicinity (Mass.) (with Prof. W. O. Crosby): *Tech. Quarterly*, 17, 165-185 (1904).
- The clays and clay industries of Connecticut: *Conn. Geol. and Nat. Hist. Survey*, Bull. No. 4, 121 pp., 13 pls. (1905).
- Recent literature on economic geology (with others): *Econ. Geology*, vol. 2, No. 1 (1907) to vol. 7, No. 1 (1912).

- Ore deposition at Aspen, Colorado: *Econ. Geology*: **4**, No. 7, 658-660 (1909). (Discussion of paper by J. E. Spurr.)
- The Norwood meteorite (?): *Science*, new ser., **31**, pp. 418-419, March 18, 1910. (Describes petrographic characters of the stone, the meteoric origin of which is doubted. Discussion of paper by Prof. Frank Very.)
- Intrusive granites and associated metamorphic sediments in southwestern Rhode Island: *Am. Jour. Sci.*, 4th ser., **29**, 447-457, 2 fig. (May 1910). (Shows granites previously regarded as pre-Cambrian to be intrusive into Carboniferous strata.)
- The lithology of Connecticut (with Prof. J. Barrell): *Conn. State Geol. and Nat. Hist. Survey*, Bull. **13**, 207 pp., 6 tables (1910). (Loughlin's part gives descriptions of the Connecticut educational series of rocks.)
- Contributions to the geology of the Boston and Norfolk basins, Massachusetts; the structural relations between the Quincy granite and the adjacent sedimentary formations: *Am. Jour. Sci.*, 4th ser., **32**, 17-32, 4 figs., (July 1911).
- Tables for determination of minerals in rock specimens. Published by Mass. Inst. Technology for use in elementary classes.
- The gabbros and associated rocks at Preston, Conn.: *U. S. Geol. Survey*, Bull. **492**, 158 pp., 14 pls., 18 figs. (1912).
- Reconnaissance in the southern Wasatch Mountains, Utah: *Jour. Geology*, **21**, No. 5, 436-452, 4 figs. (1913). (Abst.) *Jour. Wash. Acad. Sciences*, **3**, 50-51 (1913).
- A reconnaissance in the Canyon Range, west-central Utah: *U. S. Geol. Survey*, Prof. Paper **90**, 51-60, 1 pl., 5 fig. (1914). (Abst.) *Jour. Wash. Acad. Sciences*, **5**, 19 (1915).
- The oxidized zinc ores of the Tintic district, Utah: *Econ. Geology*, **9**, No. 1, 1-19, 2 pls., 8 figs. (Jan. 1914).
- An unconformity in the Narragansett Basin of Rhode Island and Massachusetts (with L. A. Hechinger): *Am. Jour. Sci.*, 4th ser, **38**, 45-64, 1 fig. (map) (July 1914).
- Recent alunite developments near Marysvale and Beaver, Utah: *U. S. Geol. Survey*, Bull. **620**, 237-270 (1915).
- Stratigraphy of the Tintic mining district, Utah: (Abst.) *Jour. Wash. Acad. Sci.*, **5**, 142 (1915).
- A reconnaissance of the Cottonwood-American Fork mining region, Utah (with B. S. Butler): *U. S. Geol. Survey*, Bull. **620**, 165-226 (1915).
- Wolframite and scheelite at Leadville, Colorado (with R. S. Fitch): *Econ. Geology*, **2**, No. 11, 30-36 (Jan., 1916); *Min. World*, **44**, 1039-1040 (1916).
- Magnesia in limestone, 11 pp. *National Lime Manufacturers' Association*, Bull. No. **4**, 11 pp. (1916).
- Ores, magmatic emanations and modes of igneous intrusion (Discussion of papers by B. S. Butler and R. A. Daly): *Econ. Geol.*, **11**, 284-288 (1916).
- Faulting in Tintic mining district, Utah: (Abs.) *Jour. Wash. Acad. Sci.*, **6**, 190 (1916).
- Crandallite, a new mineral (Tintic mining district, Utah) (with W. T. Schaller): *Am. Jour. Sci.*, 4th ser. **43**, 69-74 (1917).
- Limestone and Lime (a chapter in *U. S. Geol. Survey*, Bulletin **666**, entitled "Our Mineral Supplies"): *U. S. Geol. Survey*, Bull. **666**, 107-112 (1917).
- Zinc carbonate and related copper carbonate ores at Ophir, Utah: *U. S. Geol. Survey*, Bull. **690**, 1-14 (1917).
- Two lamprophyre dikes near Santaquin and Mount Nebo, Utah: *U. S. Geol. Survey*, Prof. Paper **120**, 101-109 (1918).
- The oxidized zinc ores of Leadville, Colorado: *U. S. Geol. Survey*, Bull. **681**, 91 pp. (1918).
- Geology and ore deposits of the Tintic district, Utah (with Waldemar Lindgren): *U. S.*

- Geol. Survey*, Prof. Paper **107**, 282 pp., 39 pls., 49 figs., 1919. (Part 1. pp. 15-104, by Loughlin).
- Other Industrial Minerals, a chapter in the book entitled, *The Strategy of Minerals*, G. O. Smith, editor. New York, D. Appleton and Company (1919).
- Rock products and the war. (Abst.) *Bull. Geol. Soc. Am.*, **30**, 97 (March 31, 1919).
- The ore deposits of Utah (with B. S. Butler and others): *U. S. Geol. Survey*, Prof. Paper **111**, 672 pp., 74 figs., 57 pls. (incl. maps), 1920.
- Limestones and marls of North Carolina (with E. W. Berry, and J. A. Cushman): *North Carolina Geol. and Econ. Survey*, Bull. **28**, 211 pp., 3 figs., 17 pls. (incl. maps), 1921.
- Needed: Complete and reliable analyses of limestones. Progress in the industry requires greater knowledge of the impurities found in limestones. Their kind, form and effect. *Rock Products*, pp. 2-24 (Sept. 10, 1921).
- Arsenic—Demand and supply: *Oil, Paint and Drug Reporter*, p. 31 (March 29, 1923).
- An interesting case of dangerous aggregate; the altered feldspar and causes of its disintegration: *Proc. Am. Concrete Inst.*, **19**, 150-153 (1923).
- Notes on ground waters: *Econ. Geology*, **19**, No. 1, pp. 62-71, 2 figs. (January-February, 1924).
- Arsenic deposits in the United States (with V. C. Heikes): *U. S. 68th Cong., 1st Sess.*, Sen. Doc. No. **27**, 7 pp. (1924).
- Guides to ore in the Leadville district, Colorado: *U. S. Geol. Survey*, Bull. **779**, 37 pp., 4 figs., 7 pls. (incl. map), 1926.
- Geology and ore deposits of the Leadville mining district, Colorado (with S. F. Emmons, J. D. Irving): *U. S. Geol. Survey*, Prof. Paper **148**, vol. 16, 368 pp., 70 pls., 111 figs. (1927).
- The weathering and seasoning of stone, Parts I and II: *Stone*, **44**, pp. 633-634, 697-698 (1923). Parts III and IV, *Stone*, **45**, pp. 31-33, 95 (1924).
- Qualifications of different kinds of natural stone for concrete aggregate: *Proc. Am. Concrete Inst.*, **23**, 319-351, 19 figs. (1927).
- Ore at deep levels in the Cripple Creek district, Colorado: *Am. Inst. Mining Eng.*, **75**, 42-73, 12 figs. (1927).
- Discussion on research in processes of ore deposition: *Am. Inst. Mining Eng.*, **76**, p. 304 (1928).
- Usefulness of petrology in the selection of limestone: *Rock Products*, **31**, No. 6, 50-59 (March 17, 1928).
- Indiana oolitic limestone. Relation of its natural features to its commercial grading: *U. S. Geol. Survey*, Bull. **811**, 113-202, 10 figs., 19 pls. (1929).
- Indiana oolitic limestone: *Mining & Metallurgy*, **10**, No. 266, pp. 65-66, 4 figs. (February 1929).
- Gold reserves of the United States (with H. G. Ferguson and others): Gold resources of the World, pp. 389-414, 2 figs., tables. *Internat. Geol. Cong.*, Pretoria, S. Africa (1930).
- Geology of Leadville and vicinity, a review of old and recent studies: (Abst.) *Jour. Wash. Acad. Sci.*, **21**, No. 15, 370 (Sept. 19, 1931).
- The results of recent geologic work at Cripple Creek, Colorado: (Abst.) *Jour. Wash. Acad. Sci.*, **22**, no. 14, 416-417 (August 19, 1932).
- Precious metal supplies and the price level: Chapter in *Mineral Economics* (F. G. Tryon and E. C. Eckel, editors); lectures, Brookings Institution; New York, McGraw-Hill Book Co. (1932).
- Leadville mining district (with C. H. Behre, jr.): *XVI Internat. Geol. Cong.*, Guidebook **19**, Colorado, Excursion C-1, pp. 77-91 (1932).
- Cripple Creek mining district: *XVI Internat. Geol. Cong.*, Guidebook **19**, Colorado, Excursion C-1 (1932), pp. 113-122.

- Classification of ore deposits (with C. H. Behre, jr.): Ore Deposits of the Western States (Lindgren Volume), *A.I.M.M.E.*, 17-55 (1933).
- Further remarks on the Cripple Creek volcano, Colorado: Talk before meeting of Am. Geophys. Union; abst. in *Proc. Am. Geophys. Union*, 1933. 13th Ann. Rept., p. 243, *Nat. Research Council* (1933).
- Zoning of ore deposits in and adjoining the Leadville district, Colorado (with C. H. Behre, Jr.): *Econ. Geology*, 29, No. 3, 215-254, 1934.
- Dissected pediments in the Magdalena district, New Mexico (with A. H. Koschmann): *Bull. Geol. Soc. Am.*, 45, no. 3, 463-477, 1934.
- The United States Geological Survey's point of view on relations between Surveys and the mining industry (with others): *Trans. Am. Inst. Min. Met. Eng.*, 115, *Mining Geology*, pp. 407-414 (1935).
- Geology and ore deposits of the Cripple Creek district, Colorado (with A. H. Koschmann): *Proc. Colo. Sci. Soc.* 13, no. 6, 217-435 (1935).
- Cripple Creek today: *Eng. and Min. Jour.*, 136, no. 8, 372-377, August 1935 (Colorado number).
- Lead and zinc resources of western United States (with E. T. McKnight): *Proc. 5th Pacific Sci. Cong. Canada 1933*, pp. 1401-1424, 3 figs., map (1934).
- Relations of structure to surface features in the Pikes Peak quadrangle, Colo.: *Jour. Washington Acad. Sci.*, 25, no. 12, 573-574 (1935).
- Zoning in certain mining districts in the Mosquito and San Juan Mountains, Colorado (with others): *16th Internat. Geol. Cong.*, Rept. vol. 1, pp. 433-446 (1936).
- The origin of lamprophyres: (Abst.) *Trans. Am. Geophys. Union*, 17th Ann. Mtg. Pt. 1, p. 235, *Nat. Research Council* (1938).
- Paragenetic study of hypogene gold and silver telluride ores of Cripple Creek, Colo. (with others): (Résumé of communications made to the *XVIIIth Int. Geol. Congress*, Moscow, 1937); *Pan-Am. Geologist*, 74, no. 1, 36-37 (1940).
- Comments on the origin and major structural control of igneous rocks and related mineral deposits: *Econ. Geology*, 36, no. 7, 671-697 (1941); Spanish transl. by Jorge Muñoz C. in *Bol. Minero Soc. Nac. Minería* (Chile), Año 58, no. 504, 348-351 (1942).
- Geology and ore deposits of the Magdalena Mining district, New Mexico (with A. H. Koschmann): *U. S. Geol. Surv.*, Prof. Paper 200, 168 pp., 38 pls., 28 figs. (1942).
- Explorations for Mineral Reserves (address delivered before the Colorado Mining Association and Amer. Mng. Congress, 1944): *Mining Congress Jour.*, 30, no. 7, 18-21 (July 1944).
- Chapters in *U. S. Geol. Survey Mineral Resources of the United States, 1913 to 1925*, as follows:
- Stone industry: 1913, pt. 2, pp. 1346-1366, 1376-1387, 1914; 1914, pt. 2, pp. 819-891, 1915; 1915, pt. 2, pp. 761-842, 1916; 1916, pt. 2, pp. 993-1078, 1918.
 - The gypsum industry in 1914: pt. 2, pp. 261-270, 1915.
 - The production of sand and gravel in 1914: pt. 2, pp. 271-283, 1915.
 - The production of lime: 1914, pt. 2, pp. 363-373; 1915, pt. 2, pp. 245-264; 1916 pt. 2, pp. 433-462, 1918.
 - Slate: 1915, pt. 2, pp. 19-31; 1916, pt. 2, pp. 61-72; 1917, pt. 2, pp. 121-138, 1916-1918.
 - Lime in 1917: pt. 2, pp. 583-613, May 13, 1919.
 - (with Coons, A. T.). Stone in 1917: 1917, pt. 2, pp. 615-682, June 20, 1919.
 - (with Coons, A. T.). Slate in 1918: 1918, pt. 2, pp. 267-282, 1 fig., October 23, 1919.
 - (with Insley, Herbert). Lime in 1918: 1918, pt. 2, pp. 815-856, 3 figs., 3 pls., June 7, 1920.
 - (with Coons, A. T.). Stone in 1918: 1918, pt. 2, pp. 1189-1313, 8 figs., 7 pls., October 11, 1920.

- (with Coons, A. T.). Slate in 1919: 1919, pt. 2, pp. 369-375, July 29, 1921.
- (with Coons, A. T.). Lime in 1919: 1919, pt. 2, pp. 405-418, October 6, 1921.
- (with Coons, A. T.). Stone in 1919: 1919, pt. 2, pp. 419-455, October 18, 1921.
- (with Coons, A. T.). Slate in 1920: 1920, pt. 2, pp. 135-143, October 12, 1921.
- (with Coons, A. T.). Lime in 1920: 1920, pt. 2, pp. 177-188, November 3, 1921.
- (with Coons, A. T.). Stone in 1920: 1920, pt. 2, pp. 225-262, March 6, 1922.
- Magnesium in 1921: 1921, pt. 1, pp. 19-20, June 14, 1922.
- (with Coons, A. T.). Slate in 1921: 1921, pt. 2, pp. 23-30, June 29, 1922.
- (with Coons, A. T.). Lime in 1921: 1921, pt. 2, pp. 155-168, November 29, 1922.
- (with Coons, A. T.). Stone in 1921: 1921, pt. 2, pp. 175-213, January 22, 1923.
- (with Clark, Martha B.). Mineral resources of the United States in 1922 (preliminary summary): 1922, pp. 1a-124a, August 15, 1923.
- (with Coons, A. T.). Lime in 1922: 1922 pt. 2, pp. 195-206, 1923.
- (with Coons, A. T.). Slate in 1922: pt. 2, pp. 165-175, November 6, 1923.
- (with Coons, A. T.). Stone in 1922: 1922, pt. 2, pp. 261-344, 3 figs., April 10, 1924.
- (with Coons, A. T.). Slate in 1923: 1923, pt. 2, pp. 49-61, 3 figs., September 25, 1924.
- (with Coons, A. T.). Stone in 1923: 1923, pt. 2, pp. 205-234, December 18, 1924.
- (with Coons, A. T.). Lime in 1923: 1923, pt. 2, pp. 275-284, December 19, 1924.
- (with Coons, A. T.). Slate in 1924: U. S., Bur. Mines, Mineral Resources U. S., 1924, pt. 2, pp. 151-160, December 16, 1925.
- (with Coons, A. T.). Lime in 1924: U. S., Bur. Mines, Mineral Resources U. S., 1924, pt. 2, pp. 193-230, May 22, 1926.