

## Memorial of Harold Williams Fairbairn 1906–1994

CORNELIUS S. HURLBUT JR. AND JAMES B. THOMPSON JR.

Department of Earth and Planetary Sciences, Harvard University, Cambridge, Massachusetts 02138, U.S.A.

Harold Fairbairn died December 21, 1994. He was a professor emeritus in the Department of Earth, Planetary, and Atmospheric Sciences at the Massachusetts Institute of Technology, where he had been a member of the faculty since 1937. He will be remembered with affection by the hundreds of students who took his courses at M.I.T. in optical mineralogy and petrology, and especially by the many graduate students who enjoyed his advice and guidance during their doctoral research. He will also be remembered by a much wider audience for his many contributions to structural petrology and geochronology.

Harold was born on July 10, 1906, the eldest of six children of Arthur E. and Maria (Spratt) Fairbairn. Arthur Fairbairn owned and operated a general store in Ottawa, Ontario, Canada, and the family lived in an apartment above the store. Harold's early education was in Ottawa, where he graduated from high school in 1924. After working for a year at the Chemical Laboratory of the Federal Department of Mines, he entered Queen's University of Kingston, Ontario, in the fall of 1925. Summers at Queen's were spent as a field assistant for the Geological Survey of Canada. Harold received a B.Sc. degree at Queen's in the spring of 1929 with honors in geology and mineralogy. After a year of graduate study at the University of Wisconsin he transferred to the Graduate School at Harvard University, where he received the A.M. degree in 1931 and the Ph.D. in 1932. That his graduate work was completed in only three years, and at two institutions, is truly remarkable!

Harold's doctoral thesis, "The structure and metamorphism of the mountains of Brome County, Quebec," was a continuation of work he had begun while working for the Geological Survey of Canada in the summer of 1930 under the direction of T.H. Clark. The petrologic and structural work at Harvard was jointly supervised by Esper Larsen and Marland Billings. A recently published book, *Gefügekunde der Gesteine*, by Bruno Sander (1930) was recommended by Larsen as perhaps applicable to Harold's research. After struggling through the difficult German, Harold acquired an interest in structural petrology by petrofabric analysis that played a major role in his subsequent career.

After Harvard, Harold received a one-year fellowship, later extended to two, from the Royal Society of Canada for travel and study abroad. Most of the two years were spent at Innsbruck University in Austria, where he studied petrofabric analysis under the guidance of Bruno Sander. He also spent three months at Göttingen with



V.M. Goldschmidt, Fritz Laves, and Lester Strock, and another three months with Walter Schmidt and Ernst Baier at the Technische Hochschule in Berlin, where he learned X-ray methods useful in petrofabric analysis. The years in Europe were fruitful for Harold, allowing him to become acquainted with some of the foremost European geologists of the time and enabling him to travel and make field observations in Italy, Czechoslovakia, Poland, and Scandinavia.

Jobs for geologists were practically nonexistent when Harold returned to Canada in the fall of 1934, but he was fortunate in being invited to spend a postdoctoral year at Queen's with a modest stipend. During that year he gave lectures on petrofabric analysis and in 1935 prepared a manual, *Introduction to Petrofabric Analysis*, that was later expanded into a book, *Structural Petrology of Deformed Rocks*, published by Addison-Wesley Press in 1949, with a second edition in 1954. Harold was then appointed instructor in mineralogy at Queen's until 1937,

when J.E. Hawley, professor of mineralogy at Queen's, noting that Harold had the right qualifications in training and in laboratory and field work, recommended him for an opening in the Department of Geology at M.I.T. Harold got the job, starting that fall, and thus began an association with M.I.T. that was to last for 40 years. During the summer before starting work at M.I.T., however, Harold attended the International Geological Congress in the Soviet Union. Crossing the Atlantic on the *Empress* of Australia he was asked to join a group at cards that included Sheila May Sargent. Harold and Sheila were married two years later on April 18, 1939. At M.I.T., Harold taught petrology and optical mineralogy, first as assistant professor (1937–1943) and later as associate professor (1943–1955), professor (1955–1972), and professor emeritus (1972). After formal retirement, however, he continued to teach as a half-time senior lecturer until 1977.

In 1953, after preparing for a final reprinting of his book on structural petrology, Harold made a major change in the direction of his research by joining P.M. Hurley and W.H. Pinson in their productive program of geochronologic research. This research, supported mainly by the U.S. Atomic Energy Commission, continued for the next 20 years. The 19 annual reports were accompanied by more than 200 published articles and abstracts. Harold was the sole or principal author of many of these. There were also more than 20 doctoral theses, for many of which Harold was the principal supervisor.

Graduate students under Harold's supervision were given thoughtful guidance and advice but urged to feel free to follow their own ideas and inspirations. He also preferred that they be sole authors of subsequently published results. This policy led to a wide variety of studies, but all of them were linked to some aspect of petrology or structural geology. There were 19 doctoral theses, three master's theses, and two bachelor's theses. Many of his students became prominent in teaching or research. At least five were elected to the National Academy of Sciences. Among the better known are M.L. Keith, O.F. Tuttle, H.S. Yoder, W.H. Dennen, J.B. Thompson Jr., W.F. Brace, J.A. Gower, J.A. Wood, W.C. Phinney, D.R. Wones, J.M. Moore Jr., and J.L. Powell. All of us still

living are deeply grateful for Harold's guidance during our formative years and will treasure his memory.

Harold was a fellow of the Mineralogical Society of America, the Geological Society of America, and the American Academy of Arts and Sciences, and was also a member of the Geological Association of Canada, the American Geophysical Union, and the Geochemical Society. Harold, an accomplished musician, enjoyed playing classical chamber music on both viola and cello. He was an authoritative and experienced bird watcher and a long-time member of the Massachusetts Audubon Society.

Sheila died in December 1993, about a year before her husband. Harold is survived by two daughters, Ann Rigney of Worthington, Ohio, and Elspeth Milmore of London, England, and by two sons, Patrick William of Waverly, Massachusetts, and Neil Alastair of Belmont, Massachusetts. Readers interested in a more complete account of Harold's life may find it in the excellent book *A History of the First 100 Years of Geology at the Massachusetts Institute of Technology*, vol. 1, 1977, by Robert Rakes Shrock, 1032 p.

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