THE FACULTY OF MEDICINE
Harvard University

James Tutin Irving

James Tutin Irving, a longtime student of the calcification of bones and teeth, was a central authoritative figure in his special field and might well have been known as "Mr. Calcium." His fundamental investigations on the process of mineralization of these hard structures has helped lay the groundwork for improved human health everywhere.

Born on Christchurch, New Zealand, Jim moved to England at age 18 for further education. His preparation for a distinguished career in science was outstanding. At Cambridge University, he first earned a bachelor's degree with honors in physiology, followed by a Ph.D. in biochemistry, and then, and M.D. at Guys Hospital, in 1931. Along the way, he also managed a master's degree in biochemistry from Oxford University.

After an initial three-year stint as lecturer at Bristol University and a similar one at Leeds University, Jim's continuing productivity on a variety of topics in general physiology led to his appointment as head of the physiology department at the prestigious Rowett Research Institute in Aberdeen, Scotland. It was there that the opportunities for study of mineralization in bone and the continuously erupting incisor teeth of rats caught Jim's attention, and redirected his career. In 1940, Jim accepted the chair in physiology at Cape Town University in South Africa. Twelve years later, he moved to the University of Witwatersrand at Johannesburg to become professor of experimental odontology and director of dental research.

In 1959, Jim was lured to the Forsyth Dental Infirmary and Harvard School of Dental Medicine by the prospect of full-time research. Although he was first appointed as professor of anatomy, in keeping with the main thrust of his research, this was later changed to professor of physiology at the dental school.

In 1958, Jim published a monograph, entitled "Calcium Metabolism" as part of a series under the editorship of Sir Rudolph Peters and F.G. Young. It provided a critical evaluation of all the information available at that time, and established Jim's dominant position in that field. His recommendations regarding calcium requirements in humans of all ages because the basis on which the daily dietary

calcium recommendations in South Africa were promulgated. This small book also took note of the many remaining problems concerning mineralization. It opened the field to rapid development and led to his publication, in 1973, of a full-scale book on calcium and phosphorus metabolism, edited and predominantly written by Jim while in retirement. It remains a source book *par excellence*.

Jim Irving's interest in calcification of bone and dental tissues became even more focused with his appointment to Forsyth and Harvard in 1959. He had developed a method for Sudan-black staining at sites of initial mineralization, and this led directly to there important avenues of research that would occupy most of his interest—as well as the interest of several close collaborators—for the next two decades.

Jim was the first to demonstrate that lipids are involved in biomineralization, and he, together with Roy Wuthier and Irving Shapiro, set about characterizing their role and identifying the lipids and phospholipids at mineralizing sites. Jim's initial observation, Wuthier noted, "has spawned over 30 years of productive work in…dozens of laboratories around the world." The effects on Jim's own research were noteworthy as well. Comparing and contrasting the patterns of sudanophilia with those of methods for detecting calcification, histochemically, Jim studied calciphylaxis in collaboration with Hans Selye, and ectopic calcification with Herbert Fleisch.

Using Sudan black to demonstrate sites of initial mineralization proved to be a useful tool to detect upsets in mineralization earlier, and at less severe stages, in many dietary deficiencies, thus allowing study of subtle changes in hard-tissue growth and mechanisms of bone and bone matrix resorption in several systems. The resorption studies were begun in an subcutaneous implant system designed by Dr. Irving that provided the stimulus for several postdoctoral projects, as well as giving baseline data for later studies of bone loss during periodontal disease.

Jim and collaborators were the first to describe the "adaptive growth potential" of the cartilage of the mandibular condyle, and, later, to describe aging changes in condylar cartilage based on patterns of lipid staining during initial calcification.

In his later years at Forsyth and Harvard, Jim brought his considerable expertise to bear on the histological and histochemical manifestation of periodontal disease as influenced by various microorganisms. These studies emphasized the patterns of resorption and remodeling of alveolar bone during the progression of the disease.

Jim's standing in science was recognized in part by membership in many organizations in South Africa, Britain and the United States. He served for many years as editor of *Archives of Oral Biology*, and, in 1972, was presented the Isaac Schour Memorial Award by the International Association for Dental Research for outstanding achievement in teaching and research in oral biology. During retirement, Jim served as visiting professor at the universities of Illinois, Pennsylvania and California at San Francisco.

This was in addition to the usual demands of academia for speaking at seminars and invited lectures. James Irving was a kind, dignified, mild-mannered, soft-spoken individual. Being tall and with an unmistakable trace of a British accent and a like cut to his attire, he stood out in any assemblage. Possessed of that rare quality of a commanding presence, he was not easily approachable on a casual basis. Unless one had something of significance to speak to him about, the matter might best be left unsaid. Jim, like Lord Douglas, did not suffer fools gladly.

After retirement in 1973, Jim remained active in research as visiting lecturer in oral biology at Harvard School of Dental Medicine until 1977, at which time he and his wife, Janet, moved to Baltimore where he served for four years as professor, *emeritus*, at the National Institute in Aging. On moving back to Massachusetts, this delightful couple settled in Manchester, in a home overlooking the harbor. This felicitous circumstance afforded Jim the pleasure of indulging freely in his long-standing interest and expertise in the history of ships and naval warfare. Jim also had an abiding interest in the life and times of Abraham Lincoln and the Civil War. In 1937 it was through Jim's consuming love of music that he met and married Janet O'Connor, an accomplished opera singer. Being himself, quite an accomplished pianist, Jim frequently accompanied her at her recitals. Their many cultural interests led to an especially happy marital relationship.

James Tutin Irving, scientist, gentleman, scholar and benefactor of human health, will be remembered with great fondness by all who had the good fortune to be among his many friends.

Respectfully submitted,

Roy O. Greep, *chairman*
I. Leon Dogon
Paul Goldhaber
John D. Heeley
John W. Hein