

In Memoriam

Geoffrey Vincent Raynor, 1913-1983

Geoffrey Vincent Raynor, M.A., D.Sc., F.R.S., attended Oxford in the late 1930's. After graduating in chemistry, he soon became associated with the thriving research group under Prof. William Hume-Rothery, working on various aspects of alloy phase diagrams, alloy phase stability, and the electronic structure of alloys in general. Following his Ph.D. there and some further work in Hume-Rothery's laboratory, he was attracted to Birmingham University as a young research professor in the Department of Physical Metallurgy and spent all of his research career there, spanning a period of well over 30 years. He brought with him to Birmingham the new concepts being developed in Oxford relating alloy properties and stability to the electronic structure, particularly the possible relationships between the Fermi surface of the conduction electrons and the Brillouin zone.

Raynor received the Sir George Beilby Memorial Award in 1947, the Rosenbain Medal of the Institute of Metals in 1951, and the Heyn Medal of the Deutsche Gesellschaft für Metallkunde in 1956.

In 1953, Raynor wrote the *Introduction to the Electron Theory of Metals* and, in 1959, he published monographs on *The Physical Metallurgy of Magnesium and Its Alloys*. Raynor's association with Hume-Rothery continued and, in 1962, they rewrote jointly Hume-Rothery's earlier book, *The Structure of Metals and Alloys*. He also made numerous contributions on alloy theory in the form of review articles and book chapters in *Progress in Metal Physics*, *Advanced Physical Metallurgy*, *Metallurgical Reviews*, *Transactions of the Faraday Society*, etc.

Raynor became the Feeney Professor of Physical Metallurgy at Birmingham and was elected, like Hume-Rothery before him, a Fellow of the Royal Society. Later, he became an Honorary Fellow of Keeble College in Oxford. He spent some time abroad, notably as a Visiting Professor at the Institute for the Study of Metals at the University of Chicago, the Battelle Visiting Professor at Ohio State University, and a Visiting Professor in South Africa and Australia. He delivered several lectures and invited talks on the subject of the theory of alloys, and he was the first invited speaker in the biannual Hume-Rothery lecture series initiated at Oxford after Hume-Rothery's death.

In collaboration with Hume-Rothery and numerous graduate students and post-doctoral associates, he made major contributions in the interpretation of lattice parameter trends of magnesium-based alloys, and numerous investigations of ternary and higher-order phase diagrams, particularly those based on the noble metals — Cu, Ag, and Au — and those involving various transition elements such as Cr, Mn, Fe, Co, and Ni. In this latter field, Geoffrey Raynor's research group has become well-known throughout the world. He also worked on Laves phases, electron density-of-states relationships, size-factor effects, and various aspects of phase diagram determination and assessment. More recently, he was involved in very careful work on the assessment of higher-order phase diagrams based on iron.

Geoffrey Raynor was keenly interested and involved in the Alloy Phase Diagram Data Committee (APDDC) of the Metals Society and in the ASM/NBS Program, where he was a member of the International Council. He left behind a very rich record of creative work on alloy phases, phase diagrams, and phase stability and will remain known in this field as one of the pioneers, who introduced the modern concepts of chemistry and physics into the phase diagram research. His advice and experience in this area will be sadly missed.

Contributed by T. B. Massalski
Professor Massalski is Editor-in-Chief, Binary Alloy Committee, ASM/NBS Alloy Phase Diagram Data Program, and is a former student of Geoffrey Raynor.