## Charles Goodeve

Born February 21, 1904, Neepawa, Canada Died April 7, 1980

Sir Charles Goodeve OBE FRS was a Canadian chemist and pioneer in operations research. Following his early years in Canada, in 1927 he was awarded a Research Fellowship to study at University College, London. Sir Charles went on to be appointed a Lecturer in Physical Chemistry in 1930 and Reader in 1937. He was awarded the D.Sc. from the University of London in 1936 for his work and was elected a Fellow of the Royal Society, the UK's National Academy of Sciences in 1940.



Sir Charles was the director of B.I.S.R.A. (formerly the British Iron and Steel Research Association) since its inception in 1945, and under his guidance the organisation grew into the largest research association in the United Kingdom, carrying out research into all aspects of the steel industry.

Sir Charles Goodeve had a distinguished career in research before joining B.I.S.R.A. From 1942 he was in control of all research



Technology readiness levels, now the standard means of assessing technology risk, were first developed by Sir Charles Goodeve in 1962. He identified the three stages of development of technology, through fundamental research, research associations and industrial laboratories. These classifications map to the nine-point

scale of technology readiness levels conceived by NASA in 1974, and now standard throughout industry and academia in the management of technology and innovation projects.

and development for the Royal Navy. During World War II, the group he managed, the Directorate of Miscellaneous Weapons Development (D.M.W.D.), worked on antisubmarine warfare, developing "the hedgehog", an array of spigot mortars which threw small, contact-fused bombs ahead of a ship. He demonstrated a

prototype of this technology to Prime Minister Winston Churchill, and by the end of the war, this weapon had accounted for fifty U-boats. In 1942, for his work in weapons development, Sir Charles was awarded an O.B.E. At the end of the war in 1946, he was Knighted and awarded the U.S. Medal of Freedom. Sir Charles was the recipient of many other honours throughout his distinguished career. In 1962 he was awarded the Bessemer Gold Medal and later that same year he received the Carl Lueg Medal of the Verein Deutscher Eisenhuttenleute, both for his services to the steel industry. He received honorary doctorates from the Universities of Manitoba (1946), Sheffield (1956), Birmingham (1962), Newcastle upon Tyne (1970) and Salford (1974).

After retiring in 1969, Sir Charles continued to pursue his interest in operational research. He died in 1980, with Parkinson's disease, being a contributing factor.