High Temperatures-High Pressures, Vol. 47, pp. 379–381
Reprints available directly from the publisher
Photocopying permitted by license only

Obituary

Ken Mills 1935–2018

Ken Mills, one of NPL's most notable luminaries, whose work is acknowledged as groundbreaking by the steel industries around the world, died aged 83 on 13th May in Kingston Hospital.

Ken Mills graduated in chemistry from the University of Newcastle in 1956 and was awarded a PhD by Sheffield University for work on carbides in steels and their effect on creep strength. He continued his research in the USA, at the Carnegie Institute of Technology in Pittsburgh, working on the thermodynamics of alloys at high temperature. There then followed a short period at the US Steel, Edgar Bain Research Laboratories with E T Turkdogan.

On returning to the UK in 1963, Ken joined the National Chemical Laboratory which was absorbed into the National Physical Laboratory in 1965, where he developed novel measurement methods for thermodynamic properties at high temperatures. In 1974 he became head of a group working on the measurement of physico-chemical properties of materials related to heat and fluid flow in high-temperature processes. Ken had great interest in the mechanisms and underlying problems in high-temperature processes, such as variable weld penetration and mould flux behaviour in the continuous casting of steel.

Ken formally retired aged 60 (the statutory Civil Service retirement age) but NPL was able to benefit from his expertise for a few more years in a part time capacity. In 1990, Ken was appointed as a 'Personal Merit Senior Principal Scientific Officer' in recognition of his contribution and was awarded a D Sc from Sheffield University based on his published work to that time.

In 1995 Ken joined Imperial College as a Professor and lectured on metal production and heat and mass transfer. His research at Imperial College was principally focused on mould fluxes for continuous casting and slags used in steelmaking processes and on thermo-physical properties of alloys and slags. He also revived his previous interest in the estimation of the properties of slags and alloys from their chemical compositions.

Ken published over 200 peer reviewed papers in his long career. Some of these were awarded best paper at scientific meetings and by journals and he is the most cited author on mould powders. In particular he won several awards from IOM3 (Institute of Materials, Minerals and Mining):

- In 1996 the Kroll Award in recognition of significant contribution that has enhanced the scientific understanding of materials chemistry as applied to industrial production of materials;
- In 1992 and 2013 the Williams award for papers of particular merit with the manufacture and use of iron and steel
- The prestigious Bessemer Gold Medal in 2013 for outstanding services to the steel industry. The citation for his award recognises "one of the first scientists to help transform mould powder metallurgy from alchemy to science" and "renowned specialists from around the world supported the nomination."
- He was also awarded Honorary Membership of the Iron and Steel Institute of Japan (2003), an honour which he was particularly proud.

In 2002 the "Mills Symposium Metals, Slags, Glasses: High Temperature Properties and Phenomena" was held at the Institute of Materials in London to celebrate Ken's career. This drew contributions from Europe, America, Australia and Asia. Technically it was great success celebrating Ken's huge contribution to the field but also showed the esteem and fondness that the international community held him in.

He wrote three books:

- "Thermodynamic data for inorganic sulphides, selenides and tellurides"
- "Recommended values of thermophysical properties for selected commercial alloys"
- "The Casting Powders Book" with Carl-Åke Däcker to be published later this year.

This latter volume must be considered his *magnum opus* drawing together his work on mould powders over his career. Besides the many chapters he contributed to other compendia, he was also responsible for a large part of the" Slag Atlas". The immense work in producing these reviews occupied his evenings and weekends and he was always supported by his patient wife Margaret.

Ken was a splendid and generous friend to his colleagues, a grand companion, entertaining with amusing stories gathered from a lifetime of research and travel. Ken was a great family man and loved to tell everyone about his children and grandchildren. Renowned for their hospitality, Ken and his wife Margaret opened their home in Teddington to many wandering scientists and ex-colleagues from around the world.

Ken was also the most caring and attentive mentor to innumerable students. His teachings went from exemplary scientific ethics, encyclopaedic knowledge of materials and their processing; technical writing and, very importantly, critical thinking. However and above all; Ken's humbleness and openness to new ideas were the principles that undoubtedly marked his disciples in the most profound way. Many of his students continued working and frequenting him until his last days. Colleagues and students will also miss Ken's contagious enthusiasm for science and his kindness. This kindness extended not only to colleagues and friends in the academic world, but also to student's families, industrial partners and technicians in any place where Ken set afoot. Such kindness and enthusiasm permeated in all the body of his work but also in the way he lived his life. Certainly, you would always leave Ken with a smile, happier and even a little better person.

Apart from steel, Ken's great love was football and his adored Newcastle FC. He was never more relaxed than when wearing the black and white striped shirt of the Magpies. Ken was a superb cricket fast bowler and football team captain for the NPL Sports Club for many years and eventually became the instigator, organiser and driving force behind the veterans football team; playing and refereeing games from his fifties well into his seventies.

As a friend, colleague and family man, Ken will be sorely missed.

Peter Quested, Colin Lea, Bryan Roebuck and Pavel Ramirez Lopez[1]

[1]The authors acknowledge the help of Roger Morrel, Malinda McLean, Chris Gourley and Peter Lee in preparing this manuscript.