

In memoriam: Duncan Dowson (1928–2020)

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Professor Duncan Dowson, born 31 August 1928, died 6 January 2020.

It is with great regret that we have to inform the readers of our journal *Friction* that professor Duncan Dowson has passed away. He had not been feeling well in the last few years and his condition was worsened after a fall. He died in hospital on 6 January 2020. This is a great loss to all of us in the tribology community and we will remember him as one of the greatest tribologists, an eminent scientist and a visionary engineer of our time.

Professor Duncan Dowson was born on 31 August 1928 in Yorkshire, UK. He first came to the University of Leeds in 1947 and obtained his BSc (honours) degree in mechanical engineering in 1950. Only after two years of research, he was awarded with a Ph.D. for his thesis on “Cavitation in lubricating films supporting small loads” in 1952. After two years in industry, he returned to the University of Leeds as a lecturer in mechanical engineering in 1954. He was subsequently appointed a senior lecturer in 1963 and a reader in 1965, and became a professor of engineering fluid mechanics and tribology in 1966:

the world’s first holder of a chair of tribology. He remained active in research as an emeritus professor at the University of Leeds after his retirement on 30 September 1993.

Professor Dowson has made a remarkably distinguished contribution to the scientific and engineering community. He is recognized throughout the world as being the leading practitioner of the art and science of tribology, the understanding and application to the design of lubricated machine elements and synovial/prosthetic joints, a subject which in the modern context he has probably done more than any other to promote and has won him international acclaim and regard. His name is synonymous with elasto-hydrodynamic lubrication (EHL); fluid film bearings; lubricated engine components; biotribology and bioengineering; and history of tribology (a unique work of its kind—tracing the history of tribology from the early civilization (3,500 B.C.) to the present date), etc. A search from web of science on 12 January 2020 (not complete) showed his learned society publications were over 215 in number with an h-index of 48. However, according to our own personal records, he had published 404 papers by the time of his retirement in 1993 since his first publication on “Investigation of cavitation in lubricating films supporting small loads” in 1957 and a further 212 papers afterwards, a total of 616 papers. Many of us know of his work in the area of theoretical and computational analyses of fluid-film lubrication, however equally he had carried out many experimental investigations into wear testing and measurements. His research covered both engineering aspects as well as biological and medical fields. He proposed the world “Biotribology” in 1970 [1] and this field is now rapidly expanding, and even with two scientific

journals now dedicated to this subject (Biosurface and biotribology; Biotribology). His legendary collaboration with the late professor Gordon Higginson resulted in the well known Dowson-Higginson formula of the minimum film thickness in lubricated line contacts: although this formula was derived by curve-fitting from only a few numerical data points, it has been compared and validated with many thousands of numerical solutions generated from modern computers [2]. The widely used Dowson-Hamrock film thickness formula for lubricated point contacts, obtained at relatively light loading conditions, has been shown to be fairly accurate even under heavily loaded conditions [3]. Professor Dowson, together with the late professor Maurice Godet, established the Leeds-Lyon symposium on tribology and it is now one of the established events in the international tribology calendar. It is pleasing to see this year the Leeds-Lyon symposium on tribology celebrates its 47th year. These are just a few of the specific highlights that he has contributed to the field of tribology.

Such a distinguished contribution in the application of science to engineering has not only been evidenced through learned society publications discussed above but also by professional and academic distinctions. He has received honorary doctorates from many universities and prestigious awards from many respected bodies both in the UK and around the world. In addition to his ‘earned’ higher doctorate (DSc) from the University of Leeds in 1971, professor Dowson’s scientific and engineering contribution has been recognized by honorary doctorates from University of Bradford in 2003 in the UK as well as doctorates honoris causa from Chalmers University of Technology in Sweden in 1979, Institut National des Sciences Appliquée de Lyon in France in 1991, University of Liege in Belgium, and University of Waterloo, Canada, etc. After a distinguished service to the Institution of Mechanical Engineers in the UK over thirty years, he became its president in 1992–1993. He was elected a fellow of the Royal Academy of Engineering in 1982 and a fellow of the Royal Society of London in 1987. He received the order of the Commander of the British Empire (CBE) in 1989.

In addition to being the nominated lecturer for a host of high profile occasions, he received many distinguished awards and medals, including: the

Thomas Hawksley Gold Medal in 1966; the British Society of Rheology Gold Medal in 1969; the National Award American Society of Lubrication Engineers in 1974; the American Society of Mechanical Engineers Melville Medal in 1976; the American Society of Mechanical Engineers Mayo D Hersey award in 1979; the Institution of Mechanical Engineers James Clayton Prize in 1979; the Tribology Gold Medal in 1979; the Institution of Civil Engineers/Royal Society James Alfred Ewing Medal in 1988; the American Society of Mechanical Engineers Engineering–Historical Award in 1995; The Kelvin Medal in 1998; the American Society of Mechanical Engineers–The Robert Henry Thurston Award in 2000; the Institution of Mechanical Engineers James Clayton Memorial Lecturer in 2000; the Institution of Mechanical Engineers James Watt International Gold Medal in 2001, etc.

Professor Dowson was always passionate about teaching and supervision of both master and Ph.D. students (with well over 100 Ph.D. students). He established The University of Leeds Institute of Tribology in 1969 and since that date almost 150 master degrees in tribology have been awarded by the University of Leeds to postgraduate students from the UK and many other countries. His books have been used extensively as textbooks in undergraduate and postgraduate teaching and translated widely into many languages in Chinese and Japanese. He was particularly supportive to young researchers and students both from the UK and internationally. The depth of his service to individual students reflected his personal qualities of the very highest standard. He has interfaced with a vast number of students and professional colleagues both nationally and internationally and the warmth of regard which is felt for him is a measure of the entirely effective way in which he has brought his skills to bear.

Professor Dowson was closely associated with our journal *Friction*. He has met with the editorial board members of *Friction* and had several conversations over an hour (Fig. 1).

Together with one of his former Ph.D. students, then later a colleague at the University of Leeds and one of the associate editors (Zhongmin Jin), he contributed a review article on “Bio-friction” to the second issue (special issue on Bio-Tribology) of the first volume (*Friction* 1(2): 100–113 (2013)) [4].



Fig. 1 Visit to the University of Leeds by some of the editorial board members of *Friction*, on 11 June 2009.

He was very supportive of our journal and in his recommendation letter to the Institute for Scientific Information (ISI), he wrote:

“Friction is of great and immediate concern as mankind seeks to control and reduce energy losses and pollution associated with all production processes. This simple concept, experienced by all, involves complex interactions between all loaded, moving interfaces. It embraces biological, chemical and physical interactions and is of outstanding importance to machine designers and manufacturers. The control of friction calls for a full understanding of the surface interactions involved and yet many remain to be identified. The subject is of immense importance to modern life.” and then

“I have followed the impressive development of the Journal with interest and the quality of the publication is outstanding by international standards ... The journal’s solid groundwork and enormous influence offer a sound foundation for its success in the future.”

We are so pleased to report that our journal is now indexed by Science Citation Index (SCI) with an impact factor 3.0, ranking Q1 in engineering and mechanical area.

Professor Dowson was friendly, kind, nice, gentle, and always smiled. Those of us who have studied under his supervision, worked with him or simply met him will remember his intellect, extensive knowledge, warmth, witty language, peaceful mind, and valuable advices provided to us all.

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