

Charles Norman Davies
4 April 1910 – 16 July 1994



Charles Norman Davies and Pramukh Jayasekera

The literature records Norman Davies as ‘a pioneer in the fields of occupational hygiene and aerosol science’, ‘the leading exponent of aerosol science of his generation’, ‘one-of-a-kind in talent’, ‘a brilliant scientist who pioneered many aspects of aerosol science’ and ‘a legend in his time’. He was truly one of the founding fathers of aerosol science.

Davies was the elder of two sons of Connie and Charles Davies. He was educated at the local school, Kings College and was encouraged to follow in his father’s footsteps. By 1932 Davies had qualified as a pharmacist and helped to run the family business. In 1935 he graduated with a BSc in physics from University College, London. Shortly afterward he joined the Physics Section at the Government's Chemical Defence Research Establishment, Porton Down. The section was headed by H. L. Green. In 1939 he was awarded an MSc from the University of London for a thesis entitled ‘The thermal velocities of spheres and drops falling through air’. His time at Porton was very productive and he was first to point out that early filtration theories were at fault for being founded on ideal, rather than viscous fluid flow. Davies' talents for collection and collation of scientific literature references and for mathematical analysis were already evident, and that he held strong and forcibly-put views on scientific matters.

In 1944 Davies set up a laboratory in the London School of Hygiene and Tropical Medicine, where aerosol studies related to health in industry were carried out for the next 25 years. He was joined by, and supervised, a succession of postgraduate research students, a significant number of whom later went on to professorial appointments. He continued to produce large numbers of scientific papers on remarkably diverse topics, sometimes venturing into fields that might be thought the province of other disciplines, for example, lung anatomy. A series of reviews was written by Davies to keep pace with the growth of information about deposition of dust particles in the lungs. Norman Davies wanted to create for the world of small particles a science in its own right. Conforming to this vision, Davies strongly felt the need to prepare a monograph that would cover the many facets of "aerosol science". He succeeded in bringing together experts from different fields with whom he worked to create the book which marks the birth of aerosol science as it is known today (Davies, 1966). In addition he played a central role in arranging for an English translation of Fuchs' masterpiece *The Mechanics of Aerosols* in 1964.

Much of his early work in London was related to the study of dust sampling instruments. Davies published a paper on lung deposition of dust that triggered the thinking that led to the introduction of aerodynamic selective mass sampling of respirable dust instead of the microscopical counting of < 5 µm particles. In 1950 Davies was awarded a DSc from the University of London just five years after his first scientific publication. His book 'Dust is Dangerous' was published in 1954.

Davies was a founding member of British Occupational Hygiene Society (BOHS) as well as the first editor of Society's own journal *The Annals of Occupational Hygiene* from its inception in 1959 to 1968, bringing to it the strong scientific rigor that came from his academic grounding in physics.

His breadth of interests, as indicated in the 1958 BOHS membership list, read: "main professional affiliation, physicist; other affiliations, pathologist, chemist, physiologist, statistician, mathematician, heating and ventilation engineer"!

In 1970 Davies founded the aerosol laboratory at Essex with the aim of redressing the balance in the field of aerosols between an excess of theory and a lack of basic experimental research. As a logical consequence of his leadership in establishing aerosol science, Davies further advocated the establishment of a corresponding academic discipline to support the field. At Essex Davies continued his inhalation work and also made important contributions to research on atmospheric aerosols, sampling of coarse particles, coagulation, and generation of aerosols. His book on air filtration was published in 1973. During his time at Essex he supervised a number of PhD students as well as continuing his international collaboration. He travelled to Japan to give a number of lectures and was a visiting professor at the University of Houston where he gave a 25 lecture course of aerosol physics.

Perhaps his most lasting contribution to aerosol science was the founding, in 1969, of the *Journal of Aerosol Science*, devoted to gathering original and fundamental research in this nascent field. He recognised the need for an independent and interdisciplinary journal and fought courageously against other established periodicals, which treated aerosols only as side issues to their overall scope.

Davies gave up the editorship of the *Journal of Aerosol Science* before relinquishing his duties at Essex University in June 1984, but continued to work from home. His last publication was in 1988.

Davies had a passion for mountain walking, sailing and motorcycles. His competency as a sailor was legendary with many visiting scientists enjoying trips on his yacht. He published numerous articles on boats and boat building but his first publication was in *The Motor Cycle*. In addition to aerosol science he conducted pioneering work on the raising of chickens in controlled environments and the harvesting of fertilised eggs.

Norman Davies married Violet Ansell in 1936 and they had five sons: Peter, Robin, Michael, Richard and Anthony. Michael's recollections of childhood are described by Egilmez-Reynolds and Jayasekera (2000). It is evident from these that Norman was a compassionate, caring and understanding father.

Norman Davies paved the way for the explosive development of the field. He was responsible for transforming aerosol science from a fragmented collection of technical sub-specialities to a universally recognised scientific discipline.

References

Davies C.N. (1939) Streamlining and speed, *The Motor Cycle*, 13 July.

Davies C.N. (1954) *Dust Is Dangerous*, Faber and Faber, London, 116pp.

Davies C.N., editor (1966) *Aerosol Science*, Academic Press, London and New York, 468pp.

Davies C.N. (1973) *Air Filtration*, Academic Press, London, 171pp

Egilmez-Reynolds N. and P.N. Jayasekera (2000) Charles Norman Davies: A legend in his time, in *The History of Aerosol Science*, O. Preining and E.J. Davis, editors, Verlag der Österreichischen Akademie der Wissenschaften, Vienna, pp 207-220.

Fuchs N.A. (1964) *The Mechanics of Aerosols*, Pergamon Press, Oxford, England, and The Macmillan Company, New York, 422pp (translated from the original Russian).

Kasper G. (2000) A history of the Journal of Aerosol Science, in *The History of Aerosol Science*, O. Preining and E.J. Davis, editors, Verlag der Österreichischen Akademie der Wissenschaften, Vienna, pp 393-402.

Editorial board (1985) Professor Charles Norman Davies seventy-fifth birthday, *J. Aerosol Sci.* 16:89-95

Editorial board (1994) Charles Norman Davies: In memoriam, *J. Aerosol Sci.* 25:1253-1268.

*Biography prepared by
Ian Colbeck*