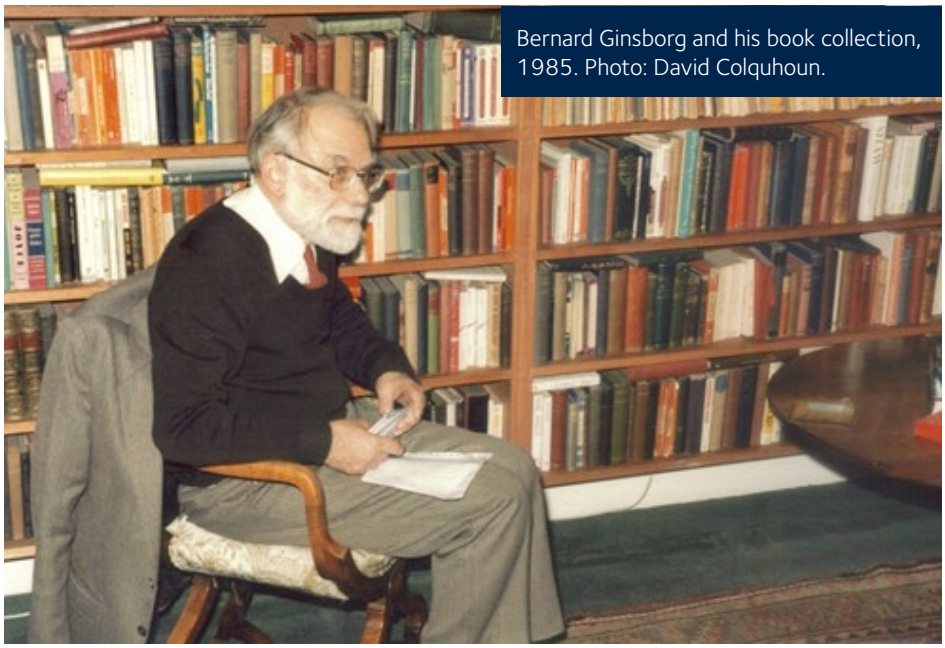

Bernard Ginsborg and his book collection, 1985. Photo: David Colquhoun.

Obituary:
Bernard Ginsborg 1925–2018

Born in London, Bernard Ginsborg graduated in physics from the University of Reading in 1948, followed by a PhD on eye movements in 1953. His life's work on membrane biophysics began when he joined the Biophysics Department at University College London. In 1957 Bernard moved to the MRC National Institute in Mill Hill when Walter Perry recruited him to join the scientific staff. In 1958 he moved again, this time to the University of Edinburgh when Perry became the Professor of Pharmacology there. Bernard ascended the academic ladder quickly from a Lectureship in 1962, to a Readership in 1964 and finally to a Personal Chair in 1976. He served as the Head of the Pharmacology Department from 1980 to 1984.

Over four decades he published research papers on numerous biophysical themes with several collaborators. His papers stand as models of scientific writing. The range of topics was wide and included human eye movements, the biophysics of invertebrate muscle membranes, synaptic transmission in amphibian sympathetic ganglia, presynaptic inhibition at the mammalian neuromuscular junction, dopamine receptors on insect salivary gland cells and ion channel behaviour in human neuroblastoma cells.

Most of Bernard's papers were published in *The Journal of Physiology*. His first paper in *The Journal* described the results of his PhD project with RW Ditchburn, and was remarkable in several ways. First, it reported the measurement of tiny involuntary movements of the eyes during a subject's fixed gaze on a stationary point. To measure such minute eye movements in a human subject is a measure of Bernard's skill as an experimentalist. The second remarkable feature of this paper is that nearly all of the measurements were made on a single subject – Bernard himself. He called these tiny eye movements "flicks" but they are now called microsaccades and are still being studied in the field of visual perception.

After Bernard joined the Biophysics Department at University College London he collaborated with Paul Fatt in a study of the excitability of crustacean muscle fibres. The impetus for this project was a paper in 1953 by Paul Fatt and Bernard Katz showing that the sodium hypothesis of Hodgkin and Huxley to explain excitability of nerve axons did not apply to crustacean muscle fibres. They concluded that "the mechanism of the action potential, and the species of ions involved in the movement of charge across the membrane remain a puzzling problem." In 1958 Paul Fatt and Bernard solved the puzzle when they discovered that electrical stimulation of the crustacean muscle membrane elicited a calcium action potential. Their paper was a turning point in the history of neuroscience. Before 1958 the existence of voltage-gated sodium channels dominated the understanding of cell excitability. The existence of voltage-gated calcium channels transformed our understanding of cellular signalling.

When Bernard left the Biophysics Department he carried its powerful imprint of high standards and in all of his later work he maintained a strong analytical approach. He also obeyed the golden rule that his name would never appear as a listed author on a paper unless he had played a significant part in the work reported.

Working with Bernard was challenging, enlightening, productive and great fun. He had a marvellous sense of humour, often aimed at his own foibles. In the lab Bernard was committed to all of the demands of the experiments and writing papers was his speciality. He had a superb understanding of electrophysiology and its literature, and was an outstanding editor of *The Journal of Physiology*.

"When Bernard left the Biophysics Department he carried its powerful imprint of high standards and in all of his later work he maintained a strong analytical approach"

Bernard was wary of authority especially in the offices of bankers, lawyers and doctors. On one occasion he ended a meeting with a consultant who was giving him advice about healthy living by telling him, "You just want to control the way I die." Bernard, however, was the soul of old-fashioned courtesy and generous with his time and help. His modesty notably outshone his intellectual brilliance.

It was a huge privilege and honour to work with him and, even more so, to become his friend. It was wonderful to listen to stories about his experiments in the Biophysics Department in London. He had a fund of tales about scientists who worked there, especially Liam Burke, Paul Fatt, Bob Martin, Ricardo Miledi, John Nicholls, Rolf Niedergerke, Bernard Katz and Sally Page.

In one of his novels PG Wodehouse, referring to a rather dim character, writes: "If men's minds were like dominoes, surely his would be the double blank." In Wodehouse's classification Bernard would be, without doubt, the double six, both as a scientist and a man. Bernard, my highly valued collaborator and very dear friend, enriched my life. I am sure that he enriched the lives of others too.

Written by Randall House
Honorary Member of The Physiological Society