

BELA JOOS

Philip R. Wallace
1915-2006



Philip Richard Wallace, Emeritus Professor of Physics at McGill University, and a leading figure in theoretical physics in Canada, died in Victoria on Monday March 20th, 2006. His life spanned most of the 20th century. Born in Toronto in 1915, he entered physics when it was an emerging field. As he wrote in a *Physics in Canada* article published in 1993, he chose physics because “relativity and quantum mechanics, and cosmology were in the air, despite the schools” [1]. He was one of the first Canadian trained theoretical physicists, and became a major force in establishing theoretical physics as a discipline amidst a skeptical environment, “dominated by the pragmatic approach represented by Rutherford” [1]. He played a major role in the nuclear research performed during the war in the Montreal laboratory run by the National Research Council, an experience which he recounted in the millennium issue of *Physics in Canada* [2]. Both *Physics in Canada* articles are a delight to read. They are very entertaining and bring to life a whole era.

Professor Wallace was educated at the University of Toronto, obtaining his PhD in 1940 under the supervision of Leopold Infeld, who was one of Albert Einstein’s close collaborators. Following three years in the United States at the University of Cincinnati and M.I.T., he was asked to return to Canada to take part in a multinational effort to explore the feasibility of graphite-moderated nuclear reactors; this was part of a plan to develop nuclear weapons. This lab was very active and, its accomplishments have been recently extensively reviewed by M.M.R. Williams [3]. Wallace did very important work on the effect of graphite under neutron irradiation. As recounted by Williams, “E.P. Wigner had predicted that graphite would shrink under neutron bombardment. As there was no experience in Canada of such matters, Wallace was sent to Bristol, England for several months to work in Sir Neville Mott’s department. This led to his first paper on the band structure of graphite published in 1949. This was followed by another paper dealing with radiation effects which suggested a result contrary to that of Wigner: Wallace predicted an expansion of the lattice in the direction perpendicular to the planes by about 15%, which was verified experimentally. The trick was that interstitial atoms formed diamond bonds with the carbon atoms of the layers. This must have been one of the rare occasions, when Wigner was wrong”. It is to be noted that both papers are still quoted today. When the Montreal war time laboratory closed, Philip Wallace joined McGill University in 1946 as an Associate Professor in the Department of Mathematics. This is where theoretical physicists would be located usually in Canadian universities in those early days, and in some cases still are. He was promoted Professor of Mathematical Physics in 1949, and then came over to the Department of Physics as a Professor in 1961. In the meantime he contributed greatly to the emergence of theoretical physics in Canada. He founded the Theoretical Physics Division of the CAP, and was its first Chair. It held its first summer school in 1957 in Banff [1]. He created McGill’s Institute of Theoretical Physics, and served as its Director, before theoretical physics was finally integrated in the Department of Physics.

His research started in relativity, then moved into nuclear physics, and concurrently into solid state physics, with the pioneering calculation of the band structure of graphite. In the early sixties, Philip Wallace turned his attention to the newly discovered work on positron

annihilation, and published what became the standard reference in the field in the Seitz and Turnbull, Solid State Physics series. The last part of his research career established him as a world authority on semiconductors and semimetals, in particular their behaviour under intense magnetic field.

Professor Wallace never shied from new challenges. Late in his career, he started a course in physics for students in the humanities and the social sciences. This challenging enterprise led to the writing of the book *Physics: Imagination and Reality* (1991). He also wrote later *Paradox Lost: Images of the Quantum* (1996), and earlier *Mathematical Analysis of Physical Problems* (1972,1984). These three books are still available in print, which is a testimony to the quality of his writing. As the publication dates of the first two books show, Professor Wallace remained very active way past his retirement from McGill in 1981. From 1984 to 1987, he was Principal of the Science College at Concordia University in Montreal, before moving to Victoria. Professor Wallace was an avid francophile who had a lengthy collaboration with physicists at the Laboratoire National des Champs Magnétiques Pulsés at the INSA in Toulouse, France, and in Victoria was an active member of the Alliance Française. As a graduate student, I spent two summers working at the INSA and witnessing his love of French culture (I was his last graduate student, graduating in 1979).

Professor Wallace was predeceased in 2003 by his beloved wife of 63 years, Jean Elizabeth (née Young). He leaves behind two sons Michael and Robert, and a daughter Joan Nadeau, and his grandchildren Ian (Nicole), Heather, Valerie and Nicola, and great-grand child Celeste.

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(Author's title given as of the time of writing)