

Peter Swinnerton-Dyer

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[114, 1772, 1943, 2016, 2, 3, 10]

Wikipedia: https://en.wikipedia.org/wiki/Peter_Swinnerton-Dyer

Essay by Vivian Choong

Peter Swinnerton-Dyer (also known as Sir Henry Peter Francis Swinnerton-Dyer) was an English mathematician specializing in number theory. Swinnerton-Dyer was born in Ponteland, Northumberland, the son of Sir Leonard Swinnerton-Dyer. The entire family moved to Shropshire early in Peter's life. Being the first in his family to go to university, Peter attended Trinity College in Cambridge for his Ph.D. in 1945. Although he became a graduate student under JE Littlewood, he never completed his Ph.D. In 1950, Peter became a fellow at Trinity College and remained there until 1973. As a fellow at Trinity College, Swinnerton Dyer was an international bridge player, representing the British teams twice in the European Opens team championship in 1953 and 1962. In 1973, he was elected as the master of St. Catharine's and remained there for ten years. In 1983, Swinnerton-Dyer made an Honorary Fellow of St. Catherine's and Chairman of the University Grants Committee, becoming the Chief Executive of the Universities Funding Council in 1989.

In the early 1960s, Swinnerton-Dyer and Bryan Birch used the Electronic Delay Storage Automatic Calculator computer at the University of Cambridge to investigate the properties of elliptical curves. Based on the numerical results, Birch and Swinnerton-Dyer made their famous conjecture which states that given a cubic equation in two variables with integer coefficients, the number of rational solutions is governed precisely by the L-function of the elliptic curve it defines. The L-functions mentioned in the Birch and Swinnerton-Dyer conjecture also play a central role in Andrew Wiles' proof on the Taniyama–Shimura conjecture and subsequently his proof on Fermat's Last Theorem.

In the year 2000, the Birch and Swinnerton-Dyer conjecture was designated a Millennium Problem, one of seven mathematical problems selected by the Clay Mathematics Institute. Six out of seven of the problems listed by the Clay Mathematics institute remain unproven, of those being the Hodge conjecture, the Navier–Stokes existence and smoothness, the P versus NP problem, the Riemann hypothesis, the Yang-Mills existence, and mass gap, and the Birch and Swinnerton-Dyer conjecture.

Despite taking up many professions and interests, such as chairman of the University Grants Committee and the Chief Executive of the Universities Funding Council, Swinnerton-Dyer still fostered a great love for mathematics. Dr. Tom Fisher, Fellow of Trinity, describes Peter as his “academic great-grandfather (i.e., supervisor's supervisor's supervisor).” Fischer discussed the diverse set of interests Peter fostered throughout his life, saying, ‘All the time I have known him, he has been past retirement age, and yet still doing entirely original innovative research, unafraid to tackle hard problems of the sort it would be too risky to give to a graduate student.’