Robert Balson Dingle

Robert ('Bob') Dingle was born on March 26, 1926 in Manchester. He studied at Cambridge University (Tripos Part I 1945, Part II 1946) and began research in theoretical physics under the supervision of D R Hartree, earning a Ph.D from Cambridge in 1952 after spending the year 1947-1948 visiting Bristol under the supervision of Professors Mott and Fröhlich. Following research positions in Delft in the Netherlands and Ottawa in Canada, he was appointed to a Readership at the University of Western Australia. In June 1960 he arrived in St Andrews as the first occupant of the Chair of Theoretical Physics. He was elected to the Royal Society of Edinburgh in 1961. After a sabbatical period in Canada, California and Western Australia, he remained in St Andrews until his early retirement through ill-health in 1987.

His original field of research was theoretical condensed-matter physics, in which he made major original contributions in several areas, described in nearly forty scientific papers. The topics included quantum and statistical physics, magnetic properties and surface reflectivity of metals, anomalous skin effect, scattering theory in semiconductors, the conductivity of thin wires, and liquid helium II. Some of this work is remembered eponymously: the Dingle temperature, Dingle-Holstein resonance, and the Dingle factor.

During this work, he encountered deep mathematical difficulties, associated with the approximate evaluation of integrals and the solution of differential equations, leading to infinite series ('asymptotic expansions') that were usually divergent. Dingle realised that existing techniques for making sense of such series, and getting useful results from them, were often crude and ill-founded, and he devoted the remainder of his research to mathematical asymptotics. It was in this area that he made his most profound and lasting contributions, described in twenty papers and culminating in his definitive and magisterial exposition 'Asymptotic expansions: their derivation and interpretation' (Academic Press 1973).

Before Dingle, almost every scientist who encountered a divergent series regarded it as meaningful only up to an inherent vagueness, usually associated with the remainder after discarding the divergent tail of the series. Much effort by mathematicians was devoted to establishing precise limits ('error bounds') on this vagueness. Dingle's approach was startlingly different: building on nineteenth-century insights by Stokes, and avoiding what he regarded as a too-limited approach by Poincaré, he regarded a divergent series as an exact coding of the function it represents. Decoding ('interpreting') such series is exact in principle, and in practice can lead to vastly improved approximations. By identifying common patterns in the divergent series commonly arising in physics and applied mathematics, he was able to establish systematic interpretive rules, now recognised as providing a solid foundation for asymptotics and the first fundamental advance in the subject for nearly a century. In subsequent decades, several other scientists arrived independently at similar concepts, but priority

was undoubtedly Dingle's, his methods were more effective, and he developed the techniques in much greater detail.

Recognition was not immediate. In large measure this was the result of Dingle's style as a scientist. He did not rush to publish each incremental advance as a separate paper, breathlessly announced at conference after conference. Rather, he was oblivious to what Ramón y Cajal called 'the sour flattery of celebrity'. And although he enjoyed several collaborations, he worked mostly alone, rarely travelled to conferences, and by modern standards of physical science his papers were 'few, but ripe'.

He was a committed and sometimes provocative teacher, remembered for his dry and often mischievous wit and the generous hospitality provided by him and his wife Helen. As a research supervisor, his advice was economical, but always helpful and perfectly to the point.

On the administrative side, he chaired the Governing Committee of the NATO Scottish Summer Schools in Physics for several years, as well as being the Director of the 1962 and 1967 Schools. He was responsible for remodelling the first-year mathematics teaching at St Andrews; he was convenor of the Project Committee for the construction of the Student Union building, overseeing the project from start to finish; and he represented the university Senate on the Union Governing Board.

Outside science, he enjoyed music (his family was musically accomplished). And his enjoyment of fine wine and good food was perfectly complemented by Helen's legendary skills as a cook. His keen interest in local history and architecture led to painstaking research and an unusual and detailed map of old St Andrews.

He died on March 2, 2010, in St Andrews, and is survived by his wife and their daughters Judith and Susie.

Michael Berry,
John Cornwell

Robert Balson Dingle. Tripos I & II, PhD (Cantab), Born 26 March 1926, elected FRSE 6 March 1961, died 2 March, 2010.