HAROLD DOUGLAS URSELL

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HAROLD DOUGLAS URSELL died of a sudden stroke in the grounds of the University of Calgary, Alberta, Canada, on 8 December, 1969. His work in widely different fields of mathematics only partially reflects his power and depth, and the high reputation he attained with specialists; for his basic philosphy was not one of personal achievement, but one of service.

He was born in Warwickshire on 16 April, 1907, the youngest of six, one of whom died in infancy. His elder brothers and sister showed ability at school, but had no chance to develop it, as the father, a master printer, died of a stroke in February 1914. At that time the family had just moved to Birmingham, and the mother was left to support it by taking in laundry and paying guests. She died in 1926, probably of cancer, and Ursell was then preparing for Part II of the Mathematical Tripos, having entered Trinity College, Cambridge, as a scholar, in 1924. He had been fortunate in that his ability was recognised early by scholarships, at Birmingham's Central Secondary School and at King Edward's Grammar School, although he did not take up mathematics until the sixth form. In 1926 Ursell became Wrangler with distinction in Schedule B, and this led to further scholarships and prizes: however, by then he was really beyond this, having laid the foundations of a cluster expansion theory for imperfect gases. He also tried his hand at Quantum Theory, at Geometry, and at Combinatory Topology, and he then turned to Almost Periodic Functions under the influence of Besicovitch. He was elected to a Trinity Fellowship in 1929, and received a Smith's Prize soon after.

The Fellowship years 1929–1933 included a year as Choate Memorial Fellow at Harvard in 1930–1931. They were crucial years for his development, and in a way they came too soon. He had some meetings with J. B. S. Haldane, whom he helped with a number of mathematical problems arising in biology, and he became a close friend of Ludwig Wittgenstein. From the latter he learned the harsh doctrine of self-suppression and silence, and this, except in rare moments of anger at mediocre concerts, he applied to himself in the softer form of self-effacement and service, which became the dominant theme of his life. To those in Cambridge after Ursell, Wittgenstein's ideas merged into a whole new atmosphere of creativity at a deeper level. This was perhaps one of the University's best periods: Hardy's return, Littlewood's much belated professorship, and the appointments of Dirac, Besicovitch, Wittgenstein, Hodge, Philip Hall, provided the initial stimulus, but the new atmosphere came even more from the steady stream of distinguished visitors and brilliant refugees from abroad. Most of this Ursell experienced only at second hand, or on occasional visits: for in 1933 he allowed professor W. P. Milne to carry him off to Leeds as lecturer. Milne would not leave without him.

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Ursell remained at Leeds University from 1933 to 1967, except for a four year war-time interruption at the Ministry of Aircraft Production and in the Senior Service. In 1937 he married a former student, Sybil Eleanor Sayer: they had five children, one of whom, John Henry took up mathematics. In 1948 Ursell became Reader. In 1965 he was awarded an ScD by Cambridge University. In 1967 he accepted a professorship at the University of Calgary: by that time his son John Henry was already in Canada, as assistant professor of mathematics at the University of Kingston, Ontario.

Ursell's papers cover a wide range of independent topics, and in a sense his work was less that of a creative mathematician than that of a consultant. In this respect his research was no different from the rest of his activities, and never took precedence over the help he gave to the most humble of undergraduates: it was usually undertaken as a service to others, and in a number of cases the work took the form of a joint paper. Also, just like his teaching and his assistance to elementary pupils, it was carried out with the most extreme conscientiousness. For this reason many of his papers are remarkably penetrating, and they sometimes involve counter-examples of great complexity. This partly represents a merging of the influence of his friends Besicovitch and Wittgenstein, the former being famous for his counter-examples, the latter for his stern criticism. Ursell's best known counter-examples disposed of a conjecture of R. Nevanlinna on transfinite diameters, and of one of Sierpinski and Splawa–Neyman on coverings of a linear set. However, counter-examples abound in Ursell's work, and they are all instructive. One paper which is rather typical of Ursell's thoroughness concerns sums of powers

$$S_\alpha = \Sigma_i(\omega_i)^\alpha \quad (\omega_i > 0,\ i = 1, 2, \ldots, n);$$

it studies the range of S_α given the values of similar sums S_β, S_γ, ...

Probably Ursell's deepest contributions are in point-set topology, in questions close to analysis which arise in connection with the theory of prime ends of Carathéodory or otherwise. This heading includes the joint memoir of 1951 on prime ends, the appendix to a paper of the same year by Cartwright and Littlewood on fixed points, and the joint paper with Eggleston on lightness and strong interiority. It includes also earlier papers on Cantor manifolds and on dissections of surfaces, two of which were joint with Boris Kaufmann, who himself was the author of an important paper on prime ends in two and three dimensions. It was characteristic of Ursell that, when Kaufmann's mental health completely broke down under the strain of great poverty, Ursell adopted him and founded a Trust Fund to attend to his needs.

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21. " Some methods of proving measurability ", *Fund. Math.*, 32 (1939), 311–330.
22. " The motion of a solid through an infinite liquid under no forces ", *Proc. Cambridge Philos. Soc.*, 37 (1941), 150–167.
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