

WILLIAM KEITH BURTON
BSc(Manc), MSc, PhD(Brist)

Keith Burton was born in Manchester on 12th October 1922 and died at his home in Milngavie on 30th December 1996. He was educated at Manchester Grammar School, then studied electrical engineering at the Manchester College of Technology. After graduation he worked for GEC at Heywood and Wembley, and then for ICI at the Frythe research centre.

Recognising his development towards abstract research, ICI generously supported him to come in 1947 to the physics department at Bristol University, where the very active theoretical division was led by N F Mott and H Fröhlich. Keith collaborated with F C Frank and N Cabrera in a study of surface processes in crystal growth, to which his prime contribution was an analysis of the statistical thermodynamics of islands of monomolecular thickness on a clean crystal surface. He showed that, in the absence of crystal defects, such islands could nucleate and grow only at supersaturations far higher than those at which growth does in fact readily proceed. This, along with Frank's insight that a permanent growth terrace is formed where a screw dislocation cuts the surface, was the foundation of the classic paper of Burton, Cabrera and Frank in the *Philosophical Transactions of the Royal Society*, which is still the standard citation in its field.

The Bristol department had a joint interest in solid state physics and field theory. Keith Burton could never contemplate a physical question without digging through to its foundations, so he became keenly interested in the quantum theory of fields and continued to work on this after his move to Glasgow in 1951. He became an enthusiastic propagandist for path integral methods in quantum mechanics, to which he made a considerable contribution.

Keith's interest in the logical basis of physics led to a useful collaboration with R Giles, whose seminal book on the logic of thermodynamics owed much to their discussions. He took up E T Jaynes's probabilistic interpretation of statistical mechanics (to which he converted the writer) with its link to information theory, and became involved in extensive correspondence, mainly with continental colleagues, on the basis of probability theory and related philosophical problems. His activity in this area was reinforced by a sabbatical profitably spent at the University of Kiel.

Keith found publication increasingly difficult because, as he expressed it, of the impossibility of saying anything without saying everything, but enjoyed leading a few research students into regions inaccessible to his immediate colleagues at Glasgow. His lectures on general theoretical physics were meticulous, lucid and profitable for successive generations of post-graduate students.

His undergraduate courses were less popular because of his predilection for logical analysis rather than fashionable detail or the solution of examination problems, but he was an excellent and popular tutor of small groups and individuals, of whom many remember him with gratitude.

In discussion with colleagues and friends Keith was talkative, witty and always interesting. One left his company feeling amused and informed, and generally with at least one new and useful idea.

Keith Burton is survived by his wife Kathleen, his faithful support and protection for many years, and by his daughter and son by an earlier marriage.

GEORGE WYLLIE